

**23<sup>rd</sup> European Conference  
on General Thoracic Surgery**

**31 May – 3 June 2015  
Lisbon Congress Center, Lisbon, Portugal**

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**SUNDAY, 31 MAY 2015****13:00 - 14:30****DATABASE AND QUALITY CERTIFICATION SESSION****F-001****THE IMPACT OF ADJUVANT CHEMOTHERAPY IN ATYPICAL CARCINOID OF THE LUNG. A PROPENSITY SCORE ANALYSIS OF THE EUROPEAN SOCIETY OF THORACIC SURGEONS LUNG NEUROENDOCRINE DATABASE**

Pier Luigi Filosso<sup>1</sup>, A. Evangelista<sup>2</sup>, F. Guerrero<sup>1</sup>, P. Thomas<sup>3</sup>, S. Welter<sup>4</sup>, P. Moreno Casado<sup>5</sup>, F. Venuta<sup>6</sup>, E. Rendina<sup>7</sup>, A. Brunelli<sup>8</sup>, L. Ampollini<sup>9</sup>, F. Ardissoni<sup>10</sup>, W. Travis<sup>11</sup>, M. Nosotti<sup>12</sup>, D. Sagan<sup>13</sup>, F. Raveglia<sup>14</sup>, O. Rena<sup>15</sup>, S. Margaritora<sup>16</sup>, I. Sarkaria<sup>17</sup>, E.S.O.T.S. Lung Neuroendocrine Working Group<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University of Turin, Turin, Italy*

<sup>2</sup>*Unit of Cancer Epidemiology, CPO Piedmont, Turin, Italy*

<sup>3</sup>*Thoracic Surgery North Hospital, APHM - Aix-Marseille University, Marseille, France*

<sup>4</sup>*Thoraxchirurgie und Thorakale Endoskopie, Ruhrlandklinik Essen, Essen, Germany*

<sup>5</sup>*Thoracic Surgery, University Hospital Reina Sofia, Cordoba, Spain,*

<sup>6</sup>*Thoracic Surgery, University of Rome Sapienza, Rome, Italy*

<sup>7</sup>*Thoracic Surgery, University of Rome Sapienza, St. Andrea Hospital, Rome, Italy*

<sup>8</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

<sup>9</sup>*Department of Surgical Sciences, Thoracic Surgery, University Hospital of Parma, Parma, Italy*

<sup>10</sup>*Thoracic Surgery Unit, University of Turin, Orbassano, Italy*

<sup>11</sup>*Pathology, Memorial Sloan Kettering cancer Center, New York, United States of America*

<sup>12</sup>*Thoracic Surgery And Lung Transplantation, Fondazione Cà Granda Ospedale Maggiore Policlinico, Milan, Italy*

<sup>13</sup>*Thoracic Surgery, Medical University of Lublin, Lublin, Poland*

<sup>14</sup>*Thoracic Surgery, AO San Paolo, Milan, Italy*

<sup>15</sup>*Thoracic Surgery Unit, University of Eastern Piedmont, Novara, Italy*

<sup>16</sup>*Department of General Thoracic Surgery, Catholic University, Rome, Italy*

<sup>17</sup>*Thoracic Surgery, University of Pittsburgh Schools of the Health Sciences, Pittsburgh, United States of America*

**Objectives:**

Atypical Carcinoids (ACs) of the lung are uncommon neoplasms with a biological behavior still not entirely understood. The efficacy of adjuvant regimens remains unclear, since these tumors do not seem completely responsive to chemo-radiotherapy. Moreover, local or distant relapses are not unusual in ACs. The aim of this study is to evaluate the impact of adjuvant treatment in resected ACs.

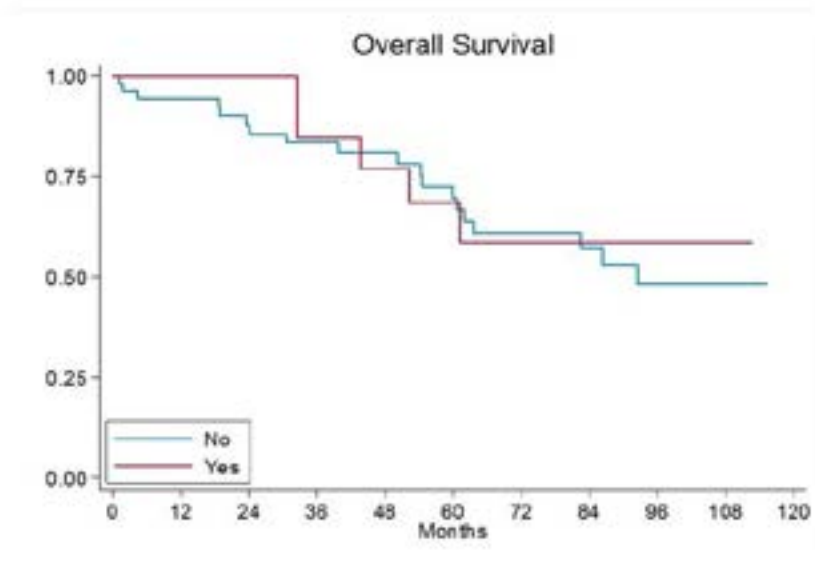
**Methods:**

This is a retrospective study, including ACs operated between 1992 and 2012, in 17 institutions worldwide. Stage I tumors were excluded from the analysis. Overall survival (OS), calculated from date of resection, was estimated by the Kaplan-Meier method. Propensity Score (PS) for the likelihood of having been submitted to adjuvant chemotherapy (CT) was estimated based on the following variables: age, gender, smoking history, previous malignancy, ECOG Performance Score (ECOG-PS), pTNM stage, resection status and year of surgery. PS-adjusted and Multivariable-adjusted OS comparisons by adjuvant chemotherapy were assessed using the Cox regression model.

**Results:**

Overall, 75 cases were encompassed in the final analysis: 19 (25 %) received adjuvant chemotherapy. The median follow-up (FU) was 51 months; FU completeness was 89 %. At the end of the study, 24 patients died (5 in the CT group). Patients receiving adjuvant-CT showed a slightly better survival (HR 0.80,  $P=0.66$  Figure 1). PS-adjusted analyses demonstrated no significant effect of adjuvant chemotherapy on OS (adjuvant-CT yes vs no HR: 0.97, 95%CI 0.34- 2.79,  $P=0.95$ , Table 1). Sensitive analysis performed using multivariable Cox model showed similar results (HR 1.06, 95%CI 0.29 -3.76  $P=0.93$ ). Age and advanced pTNM stages were independent predictors.

Figure 1: Overall Survival in AC submitted or not to adjuvant CT





	HR (95%CI)	P
Adjuvant Chemotherapy YES vs NO (Crude)	0.66. (0.29 to 2.15)	0.501
Adjuvant Chemotherapy YES vs NO (PS adjusted)	0.97 (0.34 to 2.79)	0.95
Adjuvant Chemotherapy YES vs NO (adjusted for the below factors)	1.06(0.29 to 3.76)	0.93
Age (per 1 year increase)	1.06 (1.00 to 1.12)	0.039
Male gender	1.14 (0.42 to 3.15)	0.79
Smoke	2.76 (0.91 to 8.3)	0.072
Previous Malignancy	2.89 (0.86 to 9.66)	0.086
ECOG PS>=2	1.06 (0.93 to 4.01)	0.09
pTNM		
III vs II	2.06 (0.61 to 6.96)	0.24
IV vs II	8.12 (1.5 to 43.88)	0.015
Resection status (R0 vs R1)	0.75 (0.09 to 6.43)	0.79
Year of Surgery 1999-2005 vs 1992-1998	0.99 (0.21 to 4.77)	0.99
2006-2012 vs 1992-1998	1.12 (0.26 to 4.82)	0.87

**Conclusion:**

Our results did not demonstrate any CT significant advantage on survival in resected ACs. Multi-institutional randomized clinical trials are needed to find optimal treatment for advanced stage tumors.

**Disclosure:** No significant relationships.

**F-002****THE EUROPEAN THORACIC DATA QUALITY PROJECT: COMPOSITE DATA-QUALITY SCORE TO MEASURE QUALITY OF INTERNATIONAL MULTI-INSTITUTIONAL DATABASES**

Michele Salati<sup>1</sup>, P-E. Falcoz<sup>2</sup>, A. Brunelli<sup>3</sup>

<sup>1</sup>*Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy*

<sup>2</sup>*Thoracic Surgery, NHC - Universty of Strasbourg, Strasbourg, France*

<sup>3</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

To describe the methodology for the development of data quality metrics in multi-institutional databases, deriving a cumulative data quality score (Composite Data-quality Score). The ESTS-database was used to create and apply the metrics. The Units contributing to the ESTS-database were ranked for the quality of data uploaded using the CDS.

**Methods:**

We analyzed data obtained from 96 Units contributing with at least 100 major lung resections (January 2007-December 2014). The Units were anonymized assigning a casual numeric code. The following metrics were developed for measuring the data quality of each Unit:

- record-cumulative-Completeness (COM); rate of present variables on 16 expected variables for all the records uploaded [1-null values / total expected values, the concept of “null value” was defined for each variable]
- record-cumulative-Reliability (REL); rate of consistent checks on 9 checks tested for all the records uploaded [1-inconsistent controls / total possible consistent controls, specific consistency control queries were defined]
- These two metrics were rescaled using mean and standard deviation of the entire dataset and summed, obtaining:
- Composite Data-quality Score (CDS): [COM rescaled+REL rescaled], it measures the cumulative data quality.
- The CDS was used to rank the contributors.

**Results:**

As reported in table-1, the COM of ESTS-database contributors varied from 98.59% to 43.03% and the REL from 100% to 86.98. Combining the rescaled metrics, the obtained CDS ranged between 2.67 (highest quality) to -7.85 (lowest quality). Comparing the rating using the COM to the one obtained using the CDS, 93% of Units changed their position. The larger movement was a fall down of 66 position in the list.



**Conclusion:**

We described a reproducible method for data quality assessment in clinical multi-institutional databases. The CDS is a unique indicator able to describe data quality and to compare it among Centers. It has the potential of objectively lead projects of data quality management and improvement.

Table1: Ranking of the Units using CDS

Unit CODE	COM %	REL %	COM rescaled	REL rescaled	CDS	RANK by CDS	RANK by COM	Move
00-51	98,59	99,60	2,34	0,33	2,67	1	1	=
01-50	94,94	99,45	2,07	0,30	2,37	2	3	↑
00-52	94,18	99,52	2,02	0,32	2,33	3	4	↑
04-40	95,66	98,74	2,12	0,15	2,27	4	2	↓
03-61	93,59	98,57	1,97	0,11	2,08	5	5	=
00-53	90,26	99,58	1,73	0,33	2,04	6	8	↑
04-41	90,27	99,51	1,73	0,31	2,04	7	7	=
01-51	89,69	98,85	1,69	0,17	1,86	8	10	↑
01-52	90,40	98,48	1,74	0,09	1,83	9	6	↓
00-54	86,84	99,42	1,48	0,29	1,77	10	14	↑
04-42	87,00	99,22	1,49	0,25	1,74	11	13	↑
04-43	87,83	98,23	1,55	0,04	1,59	12	12	=
08-80	84,43	99,28	1,30	0,26	1,57	13	15	↑
02-61	82,65	99,64	1,17	0,34	1,51	14	16	↑
03-62	82,54	99,38	1,18	0,28	1,45	15	17	↑
04-44	81,36	99,75	1,08	0,36	1,44	16	19	↑
01-53	80,54	99,63	1,02	0,24	1,36	17	23	↑
07-70	81,70	98,74	1,10	0,15	1,25	18	18	=
05-80	77,44	99,82	0,79	0,38	1,17	19	27	↑
03-63	80,55	98,70	1,02	0,14	1,16	20	22	↑
06-70	89,82	95,50	1,70	-0,55	1,15	21	9	↓
01-54	78,40	99,29	0,88	0,27	1,13	22	26	↑
01-55	80,57	98,53	1,02	0,10	1,12	23	21	↓
11-01	79,70	98,21	0,98	0,03	0,99	24	24	=
04-45	81,06	97,58	1,06	-0,11	0,95	25	20	↓
01-56	74,36	99,05	0,57	0,21	0,78	26	31	↑
10-01	88,27	94,28	1,58	-0,81	0,77	27	11	↓
09-20	75,93	97,47	0,88	-0,13	0,58	28	30	↑
12-70	71,92	98,49	0,39	0,09	0,48	29	32	↑
11-02	69,33	99,35	0,20	0,28	0,48	30	33	↑
07-71	76,89	96,64	0,75	-0,31	0,45	31	28	↓
13-51	62,88	99,72	-0,20	0,36	0,16	32	37	↑
23-61	62,81	99,80	-0,27	0,38	0,10	33	38	↑
23-70	84,69	99,09	-0,14	0,22	0,09	34	35	↑
50-50	82,10	99,62	-0,33	0,34	0,01	35	40	↑
50-51	80,38	100,0	-0,45	0,42	-0,03	36	47	↑
13-50	62,75	99,10	-0,28	0,23	-0,05	37	39	↑
23-71	90,61	99,60	-0,44	0,33	-0,10	38	42	↑
13-49	60,93	99,49	-0,41	0,31	-0,10	39	44	↑
23-60	64,31	98,16	-0,17	0,02	-0,14	40	36	↓
... trained at 45 of the 46 unit examined								
<b>MEDIAN</b>	<b>79,5</b>	<b>98,8</b>	considering all the contributors					
<b>SD</b>	<b>11,2</b>	<b>1,2</b>	Presented					

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****08:30 - 10:30****SESSION I: BROMPTON****B-003****ANALYSIS OF THE MOST COMMON MAJOR INTRAOPERATIVE COMPLICATIONS DURING VIDEO-ASSISTED THORACOSCOPIC SURGERY ANATOMICAL RESECTIONS - ON BEHALF OF MINIMALLY INVASIVE THORACIC INTEREST GROUP - EUROPEAN SOCIETY OF THORACIC SURGEONS**

Herbert Decaluwé<sup>1</sup>, R.H. Petersen<sup>2</sup>, H.J. Hansen<sup>2</sup>, C. Piwkowski<sup>3</sup>, F. Augustin<sup>4</sup>, A. Brunelli<sup>5</sup>, T. Schmid<sup>4</sup>, K. Papagiannopoulos<sup>5</sup>, J. Moons<sup>1</sup>, D. Gossot<sup>6</sup>

<sup>1</sup>*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

<sup>2</sup>*Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark*

<sup>3</sup>*Thoracic Surgery, Karol Marcinkowski University of Med Sciences, Poznan, Poland*

<sup>4</sup>*Operative Medizin, University of Innsbruck, Innsbruck, Austria*

<sup>5</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

<sup>6</sup>*Thoracic, IMM, Paris, France*

**Objectives:**

Multicentric evaluation of the frequency and nature of intraoperative major complications during video assisted thoracoscopic (VATS) anatomical resections.

**Methods:**

Six European centers submitted their series of consecutive anatomical lung resections intended to be performed by VATS. Conversions to thoracotomy, vascular injuries and major intraoperative complications were studied in relation to the surgeons' experience. Major complications included immediately life threatening complications (e.g. blood loss of more than 2 litres), injury to proximal airway or other organs, or complications leading to unplanned additional anatomical resections.

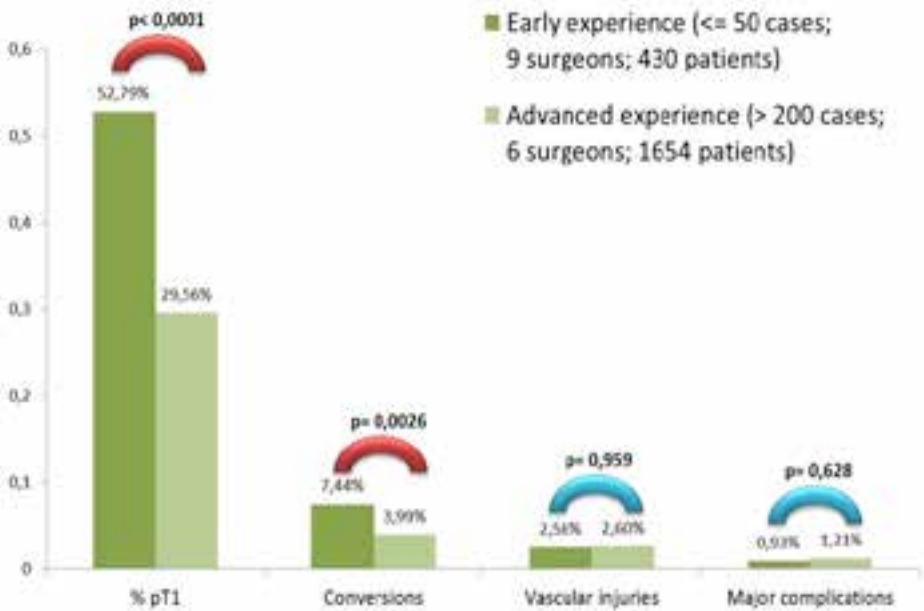
**Results:**

3077 patients were analyzed. Most resections (88%) were performed for bronchial carcinoma. There were two intraoperative deaths. In-hospital mortality was 1.4%. Conversion to open thoracotomy was observed in 171 cases (5.6%), in 21.6% for oncologic reasons, in 26.3% for technical reasons and in 46.8% for complications. Vascular injuries were reported in 88 (2.86%) patients and led to conversion in 69 (2.24%). Forty-two (1.36%) peroperative major complications were identified. These consisted of erroneous transection of bronchovascular structures (n=7); lesions to gastro-intestinal organs (n=5) or proximal airway (n= 5); complications requiring additional unplanned major surgery (n=11) or immediately life-threatening complications (n=14). A panel discussed these cases. Recommendations will be submitted for

publication. Comparing surgeon’s early experience (<50 cases; 9 surgeons in 430 patients) with advanced experience (>200 cases, 6 surgeons in 1652 patients) showed both a higher prevalence of pT1-tumors (52.8% versus 29.6%;  $p < 0.0001$ ) and a higher conversion rate (7.44% versus 3.99%;  $p = 0.0026$ ) in cases of early experience. No statistical difference for vascular injuries (2.56% versus 2.60%;  $p = 0.959$ ), nor major intraoperative complications (0.93% versus 1.21%;  $p = 0.628$ ) was observed.

**Conclusion:**

Intraoperative major complications during VATS anatomical lung resections are infrequent, but do occur, both in less and more experienced hands.



**Disclosure:** No significant relationships.

**B-004****FORECASTING THE IMPACT OF STEREOTACTIC RADIATION FOR THE TREATMENT OF EARLY LUNG CANCERS ON THE THORACIC SURGERY WORKFORCE**

Janet Edwards<sup>1</sup>, I. Datta<sup>1</sup>, J.D. Hunt<sup>2</sup>, K. Stefan<sup>3</sup>, C.G. Ball<sup>1</sup>, E. Dixon<sup>1</sup>, S. Grondin<sup>1</sup>

<sup>1</sup>*Surgery, University of Calgary, Calgary, Canada*

<sup>2</sup>*Civil Engineering, University of Calgary, Calgary, Canada*

<sup>3</sup>*Civil Engineering, HBASpecto Inc, Calgary, Canada*

**Objectives:**

To predict variation in thoracic surgery workforce requirements with the introduction of stereotactic ablative radiotherapy (SABR) for the treatment of early stage non-small cell lung cancer (NSCLC).

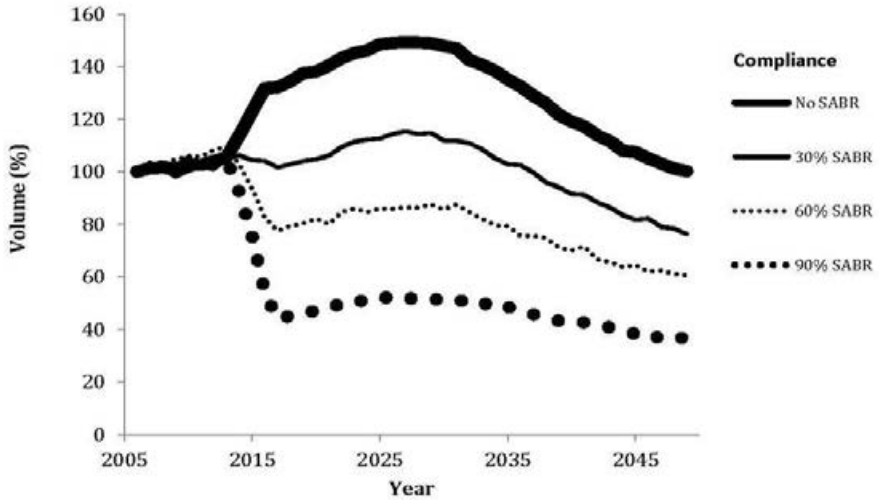
**Methods:**

Using Canadian census microdata and the Canadian Community Health Survey, a microsimulation model representing the national population was developed. The demand component simulates the incidence of lung cancer, incorporating the impact of computed tomography (CT) screening for high-risk individuals (> 30 pack-year smoking history; age 55–74 years). The supply component simulates the number of thoracic surgeons. SABR was introduced into the model to predict changes in the number of operable NSCLC per thoracic surgeon, modeling 30%, 60%, and 90% compliance with SABR for stage IA and then for both stage IA/IB NSCLC.

**Results:**

In the absence of SABR, the volume of operative NSCLC per surgeon increases by a peak of 49.4% (year 2027) and then gradually declines to present day volume by 2049. **Figure 1** shows this trend, along with predicted variation in operative NSCLC per surgeon given varying compliance with SABR for stage IA lung cancer. More dramatic decreases are seen with increasing compliance with SABR for stages IA/IB NSCLC. If the number of new surgeons entering the workforce per year were reduced by 33%, operative volume per surgeon would increase by a peak of 57.1% (30% stage IA SABR compliance) and would decrease by up to 49.1% (90% stage IA SABR compliance).

**Figure 1. Percent change in volume of operable lung cancers per thoracic surgeon given varying compliance with stereotactic ablative radiotherapy for stage IA non small cell lung cancers in the setting of computed tomographic screening.**



Monday A.M.  
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**Conclusion:**

With the implementation of SABL for treatment of early NSCLC there would be a decrease in operative volume. The impact depends upon the stage of NSCLC for which SABL is recommended and on compliance. A national strategy for thoracic surgery workforce planning is necessary given the complex interaction of CT screening and the treatment of medically operable early NSCLC with SABL.

**Disclosure:** No significant relationships.

**B-005****LOCOREGIONAL RECURRENCE AFTER SEGMENTECTOMY FOR CLINICAL T1aN0M0 NON-SMALL CELL LUNG CANCER WITH RADIOLOGICAL SOLID APPEARANCE ON THIN-SECTION COMPUTED TOMOGRAPHY**

Aritoshi Hattori, K. Suzuki, T. Matsunaga, K. Takamochi, S. Oh  
*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

We aimed to identify clinicopathological features of locoregional recurrence after segmentectomy for clinical-T1aN0M0 radiologically invasive non-small cell lung cancer (NSCLC).

**Methods:**

Between 2008 and 2014, 353 patients underwent pulmonary lobectomy or segmentectomy with nodal dissection for clinical-T1aN0M0 radiologically invasive NSCLC, which showed  $0.5 \leq \text{consolidation tumor ratio (CTR)} \leq 1.0$  on thin-section computed tomography (CT). Cox proportional hazard model was used to determine the significant clinical factors for locoregional recurrence after pulmonary lobectomy or segmentectomy.

**Results:**

Lobectomy was performed in 270 (76.5%) patients and segmentectomy in 83 (23.5%). Oncological aspects were significantly worse in patients underwent lobectomy than those in segmentectomy (CEA:  $p=0.0114$ , SUVmax, tumor size, CTR, pathological-stage, lymphovascular invasion:  $p<0.001$ , respectively). On the other hand, frequency of locoregional recurrence was equivalent in the 2 study arm (18 (6.7%) in lobectomy; 6 (7.2%) in segmentectomy:  $p=0.8588$ ). Details of recurrence sites in patients underwent segmentectomy was ipsilateral lymph node in 5 (83%) and intrapulmonary metastasis in 1 (17%). Among the eligible 353 patients, a multivariate cox regression analysis revealed radiological pure-solid appearance and tumor size were significant clinical predictors of locoregional recurrence ( $p=0.0106$ ,  $0.0408$ ), and 21 (87.5%) of the patients with locoregional recurrence showed radiological pure-solid appearance, i.e.,  $\text{CTR}=1.0$ . Thus, among the 212 clinical-T1a radiologically pure-solid NSCLC, segmentectomy and larger tumor size were independently significant clinical factors of locoregional recurrence based on a multivariate analysis ( $p=0.0292$ ,  $0.0402$ ). The 3-year recurrence-free survival of the patients underwent segmentectomy was significantly worse than that of lobectomy in c-T1a disease (82.2% vs 91.7%,  $p=0.0488$ ), if the tumor had pure-solid appearance on thin-section CT scan.

**Conclusion:**

Even in cases of small-sized lung cancer, locoregional recurrence was frequently observed for radiologically pure-solid NSCLC patients who underwent pulmonary segmentectomy. Thus, in practice, segmentectomy should be applied with great caution especially for tumors that show a pure-solid appearance on thin-section CT scan.

**Disclosure:** No significant relationships.

B-006

**PROGNOSTIC IMPACT OF NODE-SPREADING PATTERN IN SURGICALLY-TREATED SMALL-CELL LUNG CANCER: A MULTICENTER ANALYSIS**

Giovanni Leuzzi<sup>1</sup>, G. Alessandrini<sup>1</sup>, I. Sperduti<sup>2</sup>, L. Spaggiari<sup>3</sup>, F. Venuta<sup>4</sup>, E. Rendina<sup>5</sup>, P. Granone<sup>6</sup>, F. Lococo<sup>7</sup>, C. Ropicetta<sup>7</sup>, G. Sgarbi<sup>7</sup>, P. Zannini<sup>8</sup>, G. Di Rienzo<sup>9</sup>, M. Nicolosi<sup>10</sup>, F. Facciolo<sup>1</sup>

<sup>1</sup>*Department of Surgical Oncology, Thoracic Surgery Unit, Regina Elena National Cancer Institute, Rome, Italy*

<sup>2</sup>*Scientific Direction, Regina Elena National Cancer Institute, Rome, Italy*

<sup>3</sup>*Thoracic Surgery, IEO, Milan, Italy*

<sup>4</sup>*Thoracic Surgery, Umberto I General Hospital, Rome, Italy*

<sup>5</sup>*Thoracic Surgery, S. Andrea General Hospital, Rome, Italy*

<sup>6</sup>*Thoracic Surgery, Catholic University of Sacred Heart, Rome, Italy*

<sup>7</sup>*Unit of Thoracic Surgery, IRCCS Arcispedale S. Maria Nuova, Reggio Emilia, Italy*

<sup>8</sup>*Thoracic Surgery, San Raffaele General Hospital, Milan, Italy*

<sup>9</sup>*Thoracic Surgery, Vito Fazzi Hospital, Lecce, Italy*

<sup>10</sup>*Thoracic Surgery, Cannizzaro Hospital, Catania, Italy*

**Objectives:**

Although surgery in selected Small-Cell Lung Cancer (SCLC) patients has been proposed as a part of multimodality therapy, so far the prognostic impact of lymphadenectomy and node-spreading pattern was not properly elucidated. To investigate this issue, a retrospective analysis of a multicentric database was performed.

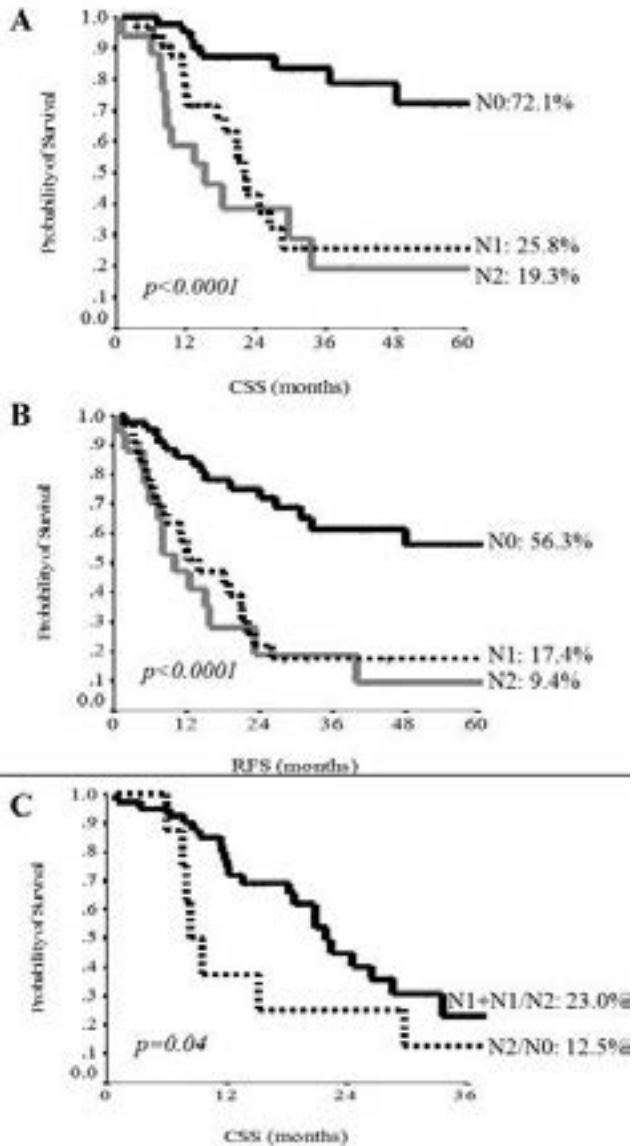
**Methods:**

From 01/1996 to 12/2012, clinico-pathological, surgical and oncological features were retrospectively reviewed in a cohort of 154 surgically-treated SCLC patients collected from 9 Institutions. A multivariate Cox proportional hazard model was developed using stepwise regression (enter/remove limits  $p=0.10-0.15$ ), in order to identify independent outcome predictors. Cancer-specific (CSS) and Relapse-free survival (RFS) were calculated by Kaplan-Meier method. The log-rank and Tarone-Ware tests were used to assess differences between subgroups.

**Results:**

Median CSS and RFS were 48 (95%CI: 19-78) and 22 (95%CI: 17-27) months, respectively. Lymphadenectomy was performed in 140 (90.9%) patients (median number of harvested nodes:11.5). Sixty-seven (43.5%) pN0 cases experienced better long-term survival (CSS:71, RFS:62 months;  $p<0.0001$ , figure 1A-B). Among node-positive patients, no prognostic differences were found between N1 and N2 involvement (CSS:22 vs 15 and RFS:14 vs 10 months, respectively;  $p=0.99$ , figure 1A-B). By splitting pN+ SCLC according to N1 involvement, patients with N2 skip-metastases showed a worse CSS (N1+N1/N2: 22 vs N2/N0: 8 months;  $p=0.04$ , figure 1C). On the other hand, no survival differences were found according

to the number of stations or node-level involved in pN2 SCLC. At multivariate analysis, pN+ (HR:3.05, 95%CI:1.21-7.67,  $p=0.02$ ) and ratio between metastatic and resected lymph-nodes (HR:1.02, 95%CI:1.00-1.04,  $p=0.03$ ) were independent predictors of CSS. Moreover, pN+ patients (HR:3.60, 95%CI:1.95-6.63,  $p<0.0001$ ) with tumor-size  $> 5$  cm (HR:1.85, 95%CI:0.88-3.88,  $p=0.10$ ) experienced a worse RFS.







**Conclusion:**

In selected surgically-treated SCLC, nodal involvement represents the best outcome predictor. According to node-spreading pattern, we may further stratify the long-term survival in such patients. Additional studies on larger series are needed to confirm these preliminary data.

**Disclosure:** No significant relationships.

**B-007****LUNG TRANSPLANTATION FOR CYSTIC FIBROSIS: DIFFERENTIAL CHARACTERISTICS AND OUTCOMES BETWEEN CHILDREN AND ADULTS**

Paula Moreno, A. Alvarez, G. Carrasco, J. Redel, H.D. Guaman, E. Arango, C. Baamonde, F.J. Algar, F. Cerezo, A. Salvatierra

*Thoracic Surgery and Lung Transplantation Unit, University Hospital Reina Sofia, Cordoba, Spain*

**Objectives:**

The survival benefit of lung transplantation (LTx) for cystic fibrosis (CF) patients is well demonstrated. We aim to compare children and adult CF recipients to assess whether there are differences in survival and clinical outcomes, and to identify risk factors for mortality.

**Methods:**

Retrospective analysis of a prospective database of 442 LTx performed at our Institution in a 20-year period. CF patients were distributed into 2 groups: children (age <18 yrs), and adults (age ≥18 yrs). Donor and recipient general demographic data, perioperative and postoperative factors including 30-day mortality, survival, primary graft dysfunction (PGD), complications, acute rejection (AR) and bronchiolitis obliterans syndrome (BOS) were analyzed and compared between groups. Univariate, Kaplan-Meier and Cox regression analyses were performed.

**Results:**

The study group included 120 consecutive CF patients: 50 children (13±3 yrs) and 70 adults (25±6 yrs) undergoing 111 bilateral, 4 lobar, 4 combined, and 1 unilateral LTx. Comparative analysis (children vs adults): Survival (overall) (5, 10, 15 yrs) 57%, 45%, 35% vs. 67%, 55%, 43% (p=0.32); survival (1-year survivors) (5, 10, 15 yrs): 75%, 64%, 46% vs 90%, 75%, 59% (p=0.09); 30-day mortality: 14% vs 16% (p=0.27); urgent LTx: 32% vs 17% (p=0.04); use of CBP: 56% vs 28% (p=0.002); ICU stay: 20±19 vs 10±9 days (p=0.006); AR episodes (n): 1.4 ±0.7 vs 1.2±0.8 (p=0.004); incidence of PGD and freedom from BOS did not differ between groups. Predictors of mortality were: age (HR: 0.97 – p=0.10), and use of CBP (HR: 2.13 – p=0.01).

**Conclusion:**

Adult CF patients present better long-term survival than children. The poorer general condition of CF children and their CBP-related higher risk of mortality, should lead to optimize their medical care in order to delay the transplant procedure until they reach adulthood.

**Disclosure:** No significant relationships.



B-008

**THE EFFECTS OF AN INTENTIONAL TRANSITION FROM EXTRAPLEURAL PNEUMONECTOMY TO EXTENDED PLEURECTOMY-DECORTICATION**

Annabel Sharkey, S. Tenconi, A. Nakas, D. Waller

*Thoracic Surgery, Glenfield Hospital, Leicester, United Kingdom*

**Objectives:**

For many years extrapleural pneumonectomy (EPP) was the operation of choice for the radical management of pleural mesothelioma in the UK. However, doubts surrounding the efficacy of EPP, and the change in demographics of the affected population, have prompted a transition in our practice towards extended pleurectomy-decortication (EPD).

**Methods:**

Data from 362 patients undergoing radical surgery (229 EPD, 133 EPP) were included. Demographics and outcome were compared between the two groups; EPP versus EPD.

**Results:**

The mean age of patients undergoing EPD was significantly higher than those undergoing EPP (64.1 years  $SD\pm 7.4$  vs 55.8 years  $SD\pm 8.7$ ,  $p<0.001$ ). There was a significantly higher proportion of patients with performance status  $>0$  in the EPD group (46.3% vs 35.4%  $p=0.047$ ). Those undergoing EPP had a significantly longer length of in-hospital stay than those undergoing EPD (18 vs 14.5 days  $p=0.029$ ). There was a significant difference in re-operation rates between the two groups EPP vs EPD (14.3% vs 7.8%  $p=0.027$ ). There was no significant difference in in-hospital, 30 day or 90 day mortality between the 2 groups ( $p=0.389$ ,  $p=0.464$  and  $p=0.344$  respectively). There was no significant difference in survival or disease free interval between the two groups ( $p=0.899$  and  $p=0.399$  respectively). Survival was significantly longer in patients over the age of 65 undergoing EPD (12.5 vs 4.7 months  $p=0.001$ ).

**Conclusion:**

The transition from EPP to EPD in our standard practice has enabled us to operate on more elderly, frail patients with no significant increase in use of hospital resources, and without detriment to overall survival.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****11:30 - 11:50****ESTS LECTURE****O-009****OUTCOME AFTER VATS AND OPEN PULMONARY LOBECTOMY IN PATIENTS WITH LOW VO<sub>2</sub> MAX: A CASE MATCHED ANALYSIS FROM THE EUROPEAN SOCIETY OF THORACIC SURGEONS DATABASE**

Shah Sheikh Sofina Begum<sup>1</sup>, K. Papagiannopoulos<sup>1</sup>, P-E. Falcoz<sup>2</sup>, H. Decaluwé<sup>3</sup>, M. Salati<sup>4</sup>, A. Brunelli<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

<sup>2</sup>*Thoracic Surgery, NHC - University of Strasbourg, Strasbourg, France*

<sup>3</sup>*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

<sup>4</sup>*Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy*

**Objectives:**

To verify the association of low VO<sub>2</sub>max with postoperative morbidity and mortality after VATS or open pulmonary lobectomy using the European Society of Thoracic Surgeons (ESTS) database.

**Methods:**

Retrospective analysis of data collected in the ESTS database. 1684 lobectomy patients with available VO<sub>2</sub>max values were included (2007-2014). Patients operated through VATS (281 patients) or thoracotomy (1403 patients) were separately analysed. Propensity score analyses were performed to match patients with high ( $\geq 15$  mL/kg/min) and low VO<sub>2</sub>max ( $< 15$  mL/kg/min) for each approach. The following variables were used to construct the score: age, BMI, ppoFEV<sub>1</sub>%, coronary artery disease, ASA grade, ECOG score. Cardiopulmonary morbidity and 30-days mortality were compared between the matched groups.

**Results:**

Mean VO<sub>2</sub>max was 17.4 mL/kg/min. 471 patients (28%) had low VO<sub>2</sub>max. Overall postoperative cardiopulmonary morbidity and mortality rates were 30% (505 patients) and 4.1% (70 patients). Morbidity and mortality rates in low VO<sub>2</sub>max patients were 33% (156 patients) and 6% (28 patients), respectively. After VATS, cardiopulmonary morbidity and mortality rates were 2-fold (13 of 72, 18% vs. 143 of 399, 36%,  $p=0.003$ ) and 5-fold (1 of 72, 1.4% vs. 27 of 399, 6.7%,  $p=0.09$ ) lower compared to thoracotomy. **Matched comparison after thoracotomy (399 pairs):** Mortality was significantly higher in patients with low VO<sub>2</sub>max (27 patients, 6.7%) compared to those with high VO<sub>2</sub>max (11 patients, 2.8%), ( $p=0.008$ ). Complication rates were similar between the two groups (143 patients, 36% vs. 133 patients, 33%, respectively,  $p=0.5$ ). **Matched comparison after VATS (72 pairs):** Morbidity and mortality rates of patients with low VO<sub>2</sub>max were similar to those of patients with high VO<sub>2</sub>max (morbidity: 13 patients, 18% vs. 17 patients, 24%,  $p=0.4$ ; mortality: 1 patient, 1.4% vs. 4 patients, 5.5%,  $p=0.4$ ).



**Conclusion:**

Low VO<sub>2</sub>max was not associated with increased surgical risk after VATS lobectomy, challenging the traditional operability criteria when this technique is used.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****12:30 - 13:30****SESSION II: VIDEOS I****V-010****LIVING-DONOR LOBAR LUNG TRANSPLANTATION WITH SPARING BILATERAL NATIVE UPPER LOBES FOR IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION***Hiroshi Date, A. Aoyama, T. Yamada, M. Sato, F. Chen**Thoracic Surgery, Kyoto University, Kyoto, Japan***Objectives:**

In living-donor lobar lung transplantation (LDLLT), only two lobes are implanted into the recipient after bilateral pneumonectomy. When donor lobes are too small, a limited amount of vascular bed would result in lung edema especially for adult patients with pulmonary hypertension. Sparing native upper lobes may be a useful strategy in this setting.

**Video description:**

A 21-year-old male patient received a diagnosis of idiopathic pulmonary arterial hypertension (IPAH) in 2005, at the age of 13 years. In spite of intensive medical treatment including high dose prostacyclin and inotropes, he became bed-bound with supplemental oxygen in 2013. His PA pressure was 70/36 mmHg. The candidates for lung donation were his parents. The height was 170 cm for the recipient, 172 cm for the father and 168 cm for the mother. The ratio of calculated graft FVC to predicted FVC of the recipient was only 40%. Preoperative perfusion scintigraphy showed that his upper lobes were better perfused. Through a clamshell incision, pleural adhesion was dissected. Then extracorporeal membrane oxygenation (ECMO) was established and activated clotting time was maintained at around 180 seconds. The fissure was developed using a linear stapling device. Right middle and lower lobectomy was performed followed by the implantation of the right graft. The sequence of the anastomosis was the bronchus, vein, and artery. The right graft was then reperfused and ventilated. Left lower lobectomy and the implantation of the left graft were performed in the same manner. PA pressure immediately after ECMO discontinuation was 44/26 mmHg and postoperative course was uneventful. PA pressure became 24/6 mmHg one month after the transplantation. At one year, the patient has returned to normal life without any restrictions.

**Conclusions:**

Sparing upper lobes can provide an encouraging strategy for adult IPAH patients who have been contraindicated for LDLLT because of size mismatches.

**Disclosure:** No significant relationships.



V-011

**THORACOSCOPIC DISSECTION OF STATIONS 2R AND 4L MINIMIZING RISK TO RECURRENT LARYNGEAL NERVES**

Wataru Nishio, K. Tane, K. Uchino, M. Yoshimura  
*Chest Surgery, Hyogo Cancer Center, Akashi, Japan*

**Objectives:**

Dissection of station 2R or station 4L is essential in complete resection of upper lobe lung cancer but tends to be insufficient for fear of damaging the recurrent laryngeal nerves by tugging or electrocautery. Improvements in thoracoscopy, visibility of minute anatomy by magnified vision, allow for precise lymph node dissection through. We present a surgical technique for thoracoscopic dissection of 2R and 4L.

**Video description:**

4-port thoracoscopy is used preferring ultrasonic coagulation and incision apparatus on low output to avoid thermal damage during perineural dissection. From the vagal nerves the recurrent laryngeal nerves and middle cardiac branches form a common stem. Severing the latter at the immediate periphery of the bifurcation exposes the recurrent laryngeal nerve and allows for a top-down dissection of 2R or 4L. Near 2R, care must be taken of the small artery which runs parallel to a middle cardiac branch. Near 4L, the operator should identify the middle cardiac branch stemming from the recurrent laryngeal nerve and sever it after sequentially severing the other sympathetic nerves found descending along the inner edge of the aortic arch. To fully dissect 4L the operator may have to sever part of the cardiac plexus as it intertwines around the innermost 4L node. Severing of ligamentum arteriosus may also be necessary for male patients. From April 2012 to September 2014, 88 cases of 2R and 43 cases of 4L dissection were performed for clinical stage I lung cancer. Five cases of unexpected 2R metastases and no 4L metastases were observed in pathological diagnosis, two of which were skip metastases.

**Conclusions:**

Improved visibility of minute anatomy by magnified vision and innovation of surgical techniques allows for mediastinal lymph node dissection with minimal risk to the recurrent laryngeal nerves and with potential to find misdiagnoses by false negatives.

**Disclosure:** No significant relationships.

V-012

**INTRA-OPERATIVE 3D ANGIOGRAPHIC IMAGING TO ENSURE SUFFICIENT SURGICAL MARGINS FOR PARENCHYMA-SPARING LUNG RESECTION OF DEEPLY LOCATED METASTATIC LUNG CANCER**Tohru Sakuragi<sup>1</sup>, H. Hisano<sup>2</sup><sup>1</sup>*Thoracic and Cardiovascular Surgery, Ohsumi-Kanoya Hospital, Kanoya, Japan*<sup>2</sup>*Radiology, Saga University Hospital, Saga, Japan***Objectives:**

Sub-lobar resection of suspicious lesions may be performed minimally invasive by Video Assisted Thoracic Surgery (VATS). However to define the precise location of the nodule is challenging if the tumor locates in the deep lung parenchyma because of different topology of the deflated lung compared to pre-operative CT and missing tactile sense of the surgeon inside the thorax. The lesions could be marked under pre-operative CT e.g. with hook wires, microcoils, threat needles or contrast media. DynaCT (Siemens AG, Forchheim, Germany) enables CT-like imaging in the hybrid operating room without the need of the patient transfer between the CT and the operation room.

**Video description:**

**METHODS:** In a 48 year-old male patient, we performed VATS and marked tumors intra-operatively by using DynaCT. The patient was in decubitus position under general anesthesia. After the thoracoscope insertion, we scanned the re-inflated lung and DynaCT showed a tumor shadow in the deep right upper lobe. Based on this 3D view, we placed four needles (4-0 prolene®) on the lung surface through the surgical port. These landmarks indicated the position of the pulmonary nodule. Another DynaCT scan demonstrated the spatial relationship between the markers and the nodule, then we resected the lung parenchyma where indicated by the closest needle to the tumor. Furthermore, DynaCT ensures us to confirm sufficient surgical margins during the procedure.

**Results:**

The patient underwent a complete parenchyma-sparing limited resection of solitary metastatic adenocarcinoma using DynaCT. We could avoid open thoracotomy for probing the tumor and even right upper lobectomy. The patient is free of systemic and local recurrence already three years after the procedure.

**Conclusions:**

We believe this novel technology has great potential for lung cancer surgery because it identifies small tumors and validates appropriate surgical safety margins intra-operatively. Thereby it increases the surgeon's confidence during the procedure.

**Disclosure:** No significant relationships.





V-013

**NOVEL APPROACH FOR PRECISE ANATOMICAL SEGMENTECTOMY/  
SUBSEGMENTECTOMY USING AN INFRARED THORACOSCOPE WITH  
TRANSBRONCHIAL INSTILLATION OF INDOCYANINE GREEN**

Yasuo Sekine, E. Koh, A. Hata, K. Ohashi

*Department of Thoracic Surgery, Tokyo Women's Medical University Yachiyo Medical Center,  
Yachiyo, Japan*

**Objectives:**

The standard approach for anatomical lung segmental resection is vascular and bronchial transections followed by division of intersegmental planes. However, the traditional method may be a challenge during minimally invasive resection. The identification of the segmental bronchus and associated vessel as well as intraoperative inflation of the lung may be difficult during Video-assisted thoracoscopic surgery (VATS). We recently developed a novel approach for performing anatomical segmentectomy/subsegmentectomy of the lung using the infrared thoracoscope with transbronchial instillation of indocyanine green (ICG). This video outlines the steps of the surgery.

**Video description:**

The case is a 75year old female with a lung adenocarcinoma of the left superior segment (S6) of the lower lobe (c-T1aN0M0 stage IA). Prior to the surgery, virtual bronchoscopy, three-dimensional pulmonary angiography and simulations of segmentectomy by volume analyzer synapse VINCENT (Fujifilm co., Tokyo) were performed in order to simulate the appropriate surgical margin from the tumor. Under general anesthesia, 10ml of 10-fold diluted ICG and 400ml of air were instilled into each associated bronchus (B6a,b,c, subsuperior bronchus and B10a). At the beginning of the surgery, infrared thoracoscope (Olympus Medical Systems, Tokyo, Japan) was used to visualize the ICG to determine the intersegmental plane for resection. The visceral pleura was marked using electric cautery, associated pulmonary arteries, veins and bronchus were ligated and divided. Finally, the intersegmental planes were divided by the use of electric cautery and endostapler to complete superior segmental resection and subsegmental resection of the posterior basal segment (S10a).

**Conclusions:**

Transbronchial ICG instillation into the relevant bronchus with use of infrared thoracoscope allows identification of intersegmental plane during thoracoscopic anatomical segmentectomy/subsegmentectomy.

**Disclosure:** No significant relationships.

V-014

**BRONCHOVASCULAR SLEEVE RESECTION OF THE LEFT UPPER LOBE FOR LUNG CANCER USING INTERPOSITION OF THE LEFT MAIN PULMONARY ARTERY WITH AUTOLOGOUS PULMONARY VEIN**Kenji Suzuki, T. Matsunaga, K. Takamochi, S. Oh*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

Background. While bronchovascular sleeve resection for lung cancer has been well-established, this operation is rarely performed. For circumferential resection of the pulmonary artery, interposition with pericardial conduit or vascular graft is one of the popular techniques. This presentation is double sleeve for left lung cancer using interposition of pulmonary artery with resected pulmonary vein.

**Video description:**

Case. A 77 year-old woman had left side lung cancer which was diagnosed to be squamous cell carcinoma of the lung. Clinical stage was T4N1M0 and left pneumonectomy was considered for resection. However this patient was elder than 70 years old and had poor lung function of FEV<sub>1,0</sub>, 1270 cc and FEV1.0%, 61.1%. Thus we decided to perform bronchovascular sleeve for this patient. Procedure in detail. On posterolateral thoracotomy systematic nodal dissection had been performed to exclude unresectable factors such as extranodal invasion. Tumor was found to invade the main pulmonary artery and pericardium was opened. The pulmonary artery was taped and the pulmonary vein was cut intrapericardially. The pulmonary artery was clamped and resected circumferentially. Tumor also invaded left second carina and bronchial sleeve was performed. Bronchus was cut and tumor was resected with left upper lobe. Bronchoplasty using 4-0 non-absorbable monofilament strings was performed at first. Then plasty of the pulmonary artery was performed using autologous resected pulmonary vein to interpose defected pulmonary artery with 6-0 non-absorbable monofilament strings. Postoperative anti-thrombotic agents were not used. Postoperative course was uneventful and patient was discharged on 8<sup>th</sup> postoperative day.

**Conclusions:**

Double sleeve using autologous pulmonary vein for lung cancer was effective to avoid pneumonectomy.

**Disclosure:** No significant relationships.



V-015

## ANTERIOR APPROACH TO STATION 7 AFTER VIDEO-ASSISTED LEFT UPPER LOBECTOMY

G. Casali, T. Batchelor, E. Internullo, R. Krishnadas, B. Nguyen, E. Teh, M. Jenkins, Douglas West

*Thoracic Surgery, University Hospital Bristol NHS Foundation Trust, Bristol, United Kingdom*

### Objectives:

This video presents an alternative approach on how to access lymph nodes in station 7 after a video assisted left upper lobectomy.

### Video description:

Conventional approach to station 7 after a left upper lobectomy follows the standard posterior approach originally developed to access the subcarinal space with a postero-lateral thoracotomy. The majority of surgeons now performs VATS lobectomy using an anterior approach. This makes difficult to achieve a good visualisation and to work effectively in the subcarinal space. This video shows 1) how to access the subcarinal space dissecting the space between bronchi and superior pulmonary vein (Anterior Approach) 2) how to perform a lymph node dissection in the subcarinal space.

### Conclusions:

We believe that this approach is easier than the conventional one, it offers a better exposure to the subcarinal space and in our experience it helps performing a more complete lymph node dissection.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****13:30 - 15:00****SESSION III: PULMONARY NON NEOPLASTIC****O-016****EFFECT OF TRANEXAMIC ACID ON SURGICAL BLEEDING IN PULMONARY RESECTION: A RANDOMIZED CONTROLLED TRIAL**Souheil Boubia<sup>1</sup>, N. Idelhaj<sup>1</sup>, R. Cherkab<sup>2</sup>, M. Ridai<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, University Hospital Ibn Rochd, Casablanca, Morocco*<sup>2</sup>*Department of Anesthesia and Intensive Care, University Hospital Ibn Rochd, Casablanca, Morocco***Objectives:**

The effectiveness of Tranexamic Acid (TA) in reducing blood loss and transfusion requirements has been amply demonstrated in many types of surgery, including traumatology and cardiovascular surgery. However, to date, there are no studies evaluating the effect of TA in pulmonary resection surgery. The aim of our study is to evaluate the effect of TA on perioperative bleeding and transfusion requirements for patients undergoing pulmonary resection surgery.

**Methods:**

Prospective randomized double blinded placebo-controlled, parallel-group trial including patients aged over 18 years, scheduled for surgical pulmonary resection. Biological, demographic, clinical, transfusion requirements, blood loss and perioperative complications data were recorded. 2 groups of patients: TA group; Placebo group (p). Statistical analysis used the Student t test with significance level  $p < 0.05$ .

**Results:**

Thirty-three patients were collected. The mean age was  $46 \pm 15.46$  years. The main co-morbidities found: COPD (8%) and pulmonary tuberculosis (4%). 54.5 % of patients belonged to the TA group ( $n = 18$ ). There was no significant difference between the two groups in per-operative blood loss assessed by surgical aspiration ( $p = 0.48$ ), gauze and surgical sites ( $p = 0.32$ ). Postoperative blood loss quantified by chest tubes were significantly lower in the TA group ( $p = 0.009$ ). On perioperative transfusion requirements, they were similar in both groups ( $p = 0.58$  vs  $0.49$ ). Also, no significant difference was found in the levels of hemoglobin, hematocrit, prothrombin. The most important per-operative and postoperative complications were bleeding (8%) and sepsis (8%). No side effects related to the TA (convulsion, thromboembolism) were noted perioperatively.

**Conclusion:**

In pulmonary resection surgery, TA seems to reduce postoperative bleeding without impact on transfusion requirements. Other large-scale studies are needed to confirm these results and will thus establish a clear protocol for the use of TA in this type of surgery.

**Disclosure:** No significant relationships.

O-017

**COMPARISON BETWEEN GENERAL ANESTHESIA AND SEDOANALGESIA IN INTERSTITIAL LUNG DISEASE: RANDOMISED PROSPECTIVE STUDY**

C. Atinkaya Öztürk<sup>1</sup>, M. Kavaz<sup>2</sup>, Talha Doğruyol<sup>1</sup>, M. Akyıl<sup>1</sup>, S. Evman<sup>1</sup>, S. Metin<sup>1</sup>, N. Coskun<sup>1</sup>, A. Mısırlıoğlu<sup>1</sup>, L. Alpay<sup>1</sup>, V. Baysungur<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Sureyyapasa Chest Disease and Thoracic Surgery Training and Research Hospital, Istanbul, Turkey*

<sup>2</sup>*Chest Disease, Sureyyapasa Chest Disease and Thoracic Surgery Research and Educational Hospital, Istanbul, Turkey*

**Objectives:**

The aim of this report is to compare impact on morbidity of wedge biopsy in diagnosis of interstitial lung disease (ILD) between under sedoanalgesia and video-assisted thoracoscopic surgery.

**Methods:**

Between March 2013 and July 2013 wedge resection was performed on both groups with VATS or sedoanalgesia randomly. General anesthesia patients (n=25) were named Group 1, while sedoanalgesia patients (n=25) were Group 2. Midazolam and fentanyl was given to patients in Group 2. VAS was used to determine pain classification. The groups were compared in terms of age, sex, operation time, complication, mortality, drainage amount, drainage time, incision size, postoperative pain and diagnosis.

**Results:**

Thirty-six of the operated patients were male, while fourteen were female; average age was 48 (22-67). In Group 1 average operation time was 42 minutes (min25-max80), while it was 40 minutes in Group 2 (min25-max50). Average chest tube duration was 20 hours in Group 1, whereas it was 16 hours in Group 2. There were no complication in two groups and one hospital mortality was observed in Group 2. Patients were discharged in an average of 3.6 days in Group 1, while in Group 2 it was 2.0 days. In Group 1, average VAS score in the first postoperative hour was 7.4, 5.0 in the sixth hour, 5.0 in 12. hour, 3.6 in 24. hour, 2.3 in the first week. In group 2 it was 7.6, 4.8, 4.0, 3.8, 1.4 respectively.

**Conclusion:**

Our results show sedoanalgesia decreases operation time and postoperative pain. Wedge biopsy with sedoanalgesia is a useful and cost-effective approach in patients with ILD to shorten hospital stay, lessen incision pain.

**Disclosure:** No significant relationships.

O-018

**SEQUENTIAL BILATERAL BRONCHOSCOPIC LUNG VOLUME REDUCTION WITH ONE-WAY VALVES FOR HETEROGENEOUS EMPHYSEMA**

Alfonso Fiorelli<sup>1</sup>, A. D'Andrilli<sup>2</sup>, C. Poggi<sup>2</sup>, D. Diso<sup>2</sup>, M. Anile<sup>2</sup>, M. Polverino<sup>3</sup>, G. Failla<sup>4</sup>, F. Venuta<sup>5</sup>, E. Rendina<sup>2</sup>, M. Santini<sup>1</sup>

<sup>1</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

<sup>2</sup>*Thoracic Surgery Unit, University La Sapienza S. Andrea Hospital, Rome, Italy*

<sup>3</sup>*Pneumology and Rehabilitation Unit, Hospital of Scafati, Scafati, Italy*

<sup>4</sup>*Pneumology and Rehabilitation Unit, Hospital of Palermo, Palermo, Italy*

<sup>5</sup>*Thoracic Surgery, Umberto I General Hospital, Rome, Italy*

**Objectives:**

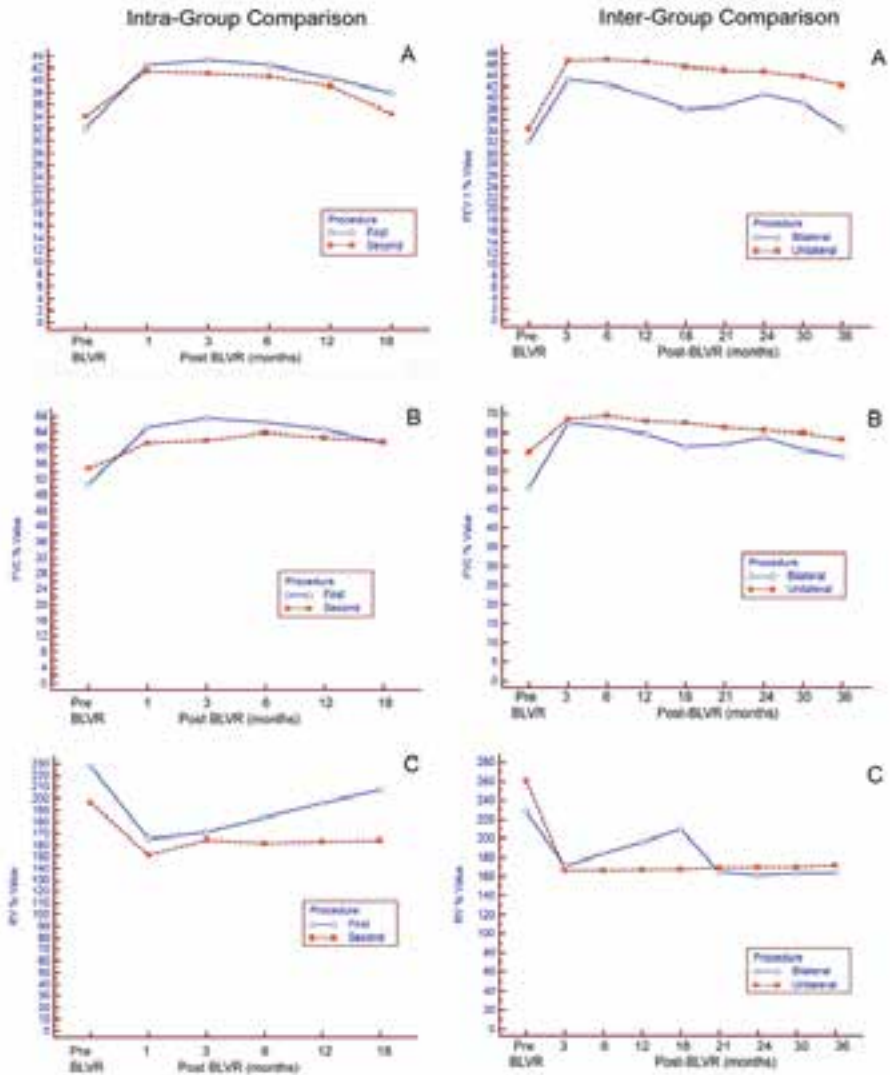
Clinical benefits of Bronchoscopic Lung Volume Reduction (BLVR) with Endobronchial valves (EBVs) have been reported for heterogeneous emphysema after unilateral treatment; however, no study has so far explored the effects of bilateral sequential BLVR. We reviewed the functional results after bilateral sequential BLVR and compared this group of patients with those undergoing unilateral BLVR in the same period.

**Methods:**

This is a retrospective multicenter study including consecutive patients with heterogeneous emphysema undergoing BLVR with EBV during the last 4 years. Patients were divided into 2 Groups according to the procedure they received (unilateral vs. bilateral). For those receiving bilateral BLVR, the timing on the contra-lateral side was determined by the decline of spirometric data to the pre-procedure levels. All patients were followed for 3 years. The functional changes within the bilateral group (intra-group comparison) and those between the bilateral and the unilateral groups (inter-group comparison) were compared.

**Results:**

Forty-nine patients were enrolled. Of these, 14 had a sequential bilateral procedure with a median interval of 18 months between the first and the second BLVR. After the first BLVR, a significant improvement of FEV<sub>1</sub>% (+6.5%;p<0.001), FVC% (+8.6%;p=0.001), and reduction of RV% (-28%;p=0.01) were seen. Similar results were obtained with the sequential BLVR procedure in comparison with pre-second operation values on FEV<sub>1</sub>% (+4.7%;p=0.003); FVC% (+4.3%;p=0.04); and RV% (-33%;p=0.003). The benefits of the first treatment were similar to those of second treatment (intra-group comparison). Yet, the improvement of respiratory functions were similar between bilateral versus unilateral groups (inter-group comparison) confirming that the second treatment is crucial to prolong the functional impact of the procedure for a longer period of time (Figure 1).



**Conclusion:**

Sequential bilateral BLVR with EBVs may produce cumulative benefits, improving and prolonging the positive effects obtained after the first procedure.

**Disclosure:** No significant relationships.

**O-019****TROUBLESHOOTING FOR BLEEDING DURING THORACOSCOPIC ANATOMIC PULMONARY RESECTION**Hitoshi Igai, M. Kamiyoshihara, N. Kawatani, T. Ibe, K. Shimizu*General Thoracic Surgery, Maebashi Red Cross Hospital, Maebashi, Japan***Objectives:**

The objective of this study was to evaluate intraoperative vessel injury and assess troubleshooting during thoracoscopic anatomic pulmonary resection.

**Methods:**

Between April 2012 and November 2014, 136 patients underwent thoracoscopic anatomic pulmonary resection, 25 of whom were identified as having intraoperative vessel injury. Significant vessel injury was defined as the bleeding which needed the compression more than 30 seconds for the hemostasis. The thoracoscopic port was placed at the 6<sup>th</sup> or 7<sup>th</sup> intercostal space on the posterior axillary line. We analyzed the injured vessel and the hemostatic procedure employed, then compared the perioperative outcomes in patients with (n=25) or without (n=111) vessel injury.

**Results:**

The surgical procedures included 20 lobectomies and 5 segmentectomies. Two of the 25 patients each had vessel injury at 2 points, giving a total of 27 points of injury. The vessels injured were branches of the pulmonary artery in 12 points, branches of the pulmonary vein in 10, and the others in 5. The procedure was converted to thoracotomy in 4 cases (apical-dorsal vein in 2 cases, anterior segmental artery or bronchial artery in 1 each). Hemostasis was achieved by compression with a cotton stick in only 4 points, application of thrombostatic sealant in 18, and by ligation, clipping or stapling in 5 points. The perioperative results in the 2 groups are shown in Table 1. Although patients without vessel injury had less intraoperative blood loss, and shorter duration of chest tube drainage, there was no difference in the length of postoperative hospitalization or morbidity.



Table 1. Perioperative results in the vessel injury group and non-vessel injury group

Variable	Vessel injury (+), n=25 (%)	Non-vessel injury (-), n=111 (%)	p-value
Operation time (min.)	255±56	225±57	0.02
Blood loss (ml)	253±378	56±113	<0.0001
Conversion to thoracotomy	4 (16)	2 (1.8)	0.01
Duration of chest tube drainage (days)	5.0±4.4	3.3±2.0	0.003
Length of postoperative hospital stay (days)	10.8±10.9	10.1±16.9	0.83
Morbidity (n)	7 (28)	21 (18.9)	0.41
Mortality (n)	0 (0)	0 (0)	not evaluated

**Conclusion:**

Thoracoscopic pulmonary resection is feasible and safe, regardless of the vessel that is injured, and application of sealants is important. In cases involving bleeding distant from the thoracoscopic port (apical-dorsal vein or anterior segmental artery in this series), conversion to thoracotomy might be safer to achieve a better operative view.

**Disclosure:** No significant relationships.

**O-020****RECURRENT AIR LEAK EARLY AFTER PULMONARY LOBECTOMY:  
AN ANALYSIS BASED ON AN ELECTRONIC AIRFLOW EVALUATION**

Cecilia Pompili<sup>1</sup>, M. Salati<sup>2</sup>, M. Refai<sup>2</sup>, F. Xiumè<sup>2</sup>, M. Tiberi<sup>2</sup>, I. Cregan<sup>1</sup>, A. Sabbatini<sup>2</sup>,  
A. Brunelli<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds,  
United Kingdom*

<sup>2</sup>*Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy*

**Objectives:**

The objective of this analysis was to evaluate the incidence and risk factors of recurrent air leak (RAL) occurring early after pulmonary lobectomy based on electronic airflow measurements.

**Methods:**

This is a prospective observational analysis on 129 consecutive patients managed with a single chest tube connected with an electronic chest drainage system. The incidence and timing of RAL among patients who had an air leak sealed within the first 24 postoperative hours was recorded. Stepwise logistic regression and bootstrap analyses were used to test the association of several baseline and surgical variables with RAL.

**Results:**

95 patients (68%) had their air leak stopped within 24 hours after the operation. Twelve patients had RAL (13%) after the first stop. Average time from the initial stop to the first recurrence was 6.3 hours. All recurrent air leaks occurred within the first 24 hours from operation. The average duration of air leak of patients with RAL was 4 days. Logistic regression showed that the presence of moderate to severe COPD (FEV1<80% and FEV1/FVC ratio < 0.7) was the only independent risk factor associated with RAL (p=0.02, bootstrap frequency 83%). Age, sex, DLCO, BMI, side and site of resection and level of regulated suction were not associated with occurrence of RAL. Seven of 27 (26%) patients with COPD had RAL, a proportion significantly higher than in patients without COPD (5 of 68, 7.3%, p=0.03).

**Conclusion:**

A large proportion of patients with COPD developed RAL. In this high-risk group, we advise against chest tube removal in the first 24 hours after operation even in case of absence or cessation of air leak.

**Disclosure:** I. Cregan: Research coordinator and employee of Medela Helthcare.



O-021

## QUALITATIVE ANALYSIS OF PREOPERATIVE HIGH-RESOLUTION COMPUTED TOMOGRAPHY SCANNING: A PREDICTOR OF PULMONARY COMPLICATION FOLLOWING MAJOR LUNG RESECTION

Yusuke Takahashi<sup>1</sup>, M. Matsuda<sup>2</sup>, S. Aoki<sup>2</sup>, H. Dejima<sup>1</sup>, T. Nakayama<sup>1</sup>, N. Matsutani<sup>1</sup>, M. Kawamura<sup>1</sup>

<sup>1</sup>Department of General Thoracic Surgery, Teikyo University School of Medicine, Itabashi-ku, Japan

<sup>2</sup>Department of Radiology, Teikyo University School of Medicine, Itabashi-ku, Japan

### Objectives:

Postoperative pulmonary complications following major lung resection, which are strongly associated with postoperative mortality, remain relatively common. Recently, qualitative findings on high-resolution computed tomography (HRCT) scans such as emphysema (EM), bronchiectasis (BE), and bronchial wall thickening (BWT), are shown to be indicators of prognosis and severity in chronic obstructive pulmonary disease. We aimed to clarify predictive ability of qualitative HRCT findings for pulmonary complications following major lung resection.

### Methods:

356 consecutive patients underwent major lung resection during the period from May 2010 to December 2014, were included in this analysis. Perioperative clinical data were collected and preoperative HRCT were evaluated retrospectively. We examined the correlation between pulmonary complications and HRCT findings.

### Results:

Patients who developed pulmonary complication were significantly associated with greater smoking history ( $p < 0.001$ ), greater proportion of male gender ( $p < 0.001$ ), lower forced vital capacity ( $p = 0.011$ ), more frequent EM ( $p < 0.001$ ), more frequent BE ( $p = 0.001$ ), more frequent BWT ( $p < 0.001$ ), larger proportion of extended resection ( $p = 0.002$ ), longer operative time ( $p = 0.001$ ), and greater intraoperative blood loss ( $p < 0.001$ ). The logistic regression analysis revealed that EM (odds ratio 3.646, 95% confidence interval (CI): 1.794-7.410,  $p < 0.001$ ), BE (odds ratio 3.421, 95%CI: 1.554-7.532,  $p = 0.002$ ), BWT (odds ratio 12.31, 95%CI: 5.508-27.49,  $p < 0.001$ ), and Intraoperative blood loss (odds ratio 3.997, 95%CI: 1.785-8.950,  $p = 0.001$ ) were independent predictors. The sensitivity and specificity of combination of the three HRCT findings were 86.9% and 71.4%, respectively, at a cut-off of one of the three findings, with the AUC of 0.844 (95%CI: 0.792-0.895).

### Conclusion:

We have clearly shown the qualitative findings such as EM, BE, and BWT on HRCT independent predictors of pulmonary complications following major lung resection. The current data emphasizes the importance of preoperative careful evaluation on HRCT for not only oncological staging, but also the prediction of postoperative pulmonary complications.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****13:30 - 15:30****SESSION IV: PULMONARY NEOPLASTIC I****O-022****VATS IS AS EFFECTIVE AS OPEN APPROACH FOR RESECTION OF PULMONARY METASTASES OF COLORECTAL ORIGIN AND ANATOMICAL RESECTION AND IT IMPROVES SURVIVAL OVER WEDGE IN THE SPANISH PROSPECTIVE MULTICENTER STUDY (GECMP-CCR)**

Jorge Hernandez<sup>1</sup>, L. Molins<sup>1</sup>, J.J. Fibla<sup>1</sup>, F. Heras<sup>2</sup>, R. Embun<sup>3</sup>, J.J. Rivas De Andres<sup>3</sup>

<sup>1</sup>*Thoracic Surgery, Sagrat Cor University Hospital and Hospital Clinic, Barcelona, Spain*

<sup>2</sup>*Thoracic Surgery, Valladolid University Hospital, Valladolid, Spain*

<sup>3</sup>*Thoracic Surgery, Miguel Servet, Zaragoza, Spain*

**Objectives:**

To evaluate the prognostic impact in patients undergoing surgery for lung metastases from colorectal cancer (LM-CRC) according to the surgical approach and type of pulmonary resection (wedge versus anatomical).

**Methods:**

A prospective multicenter registry to study the clinical prognostic factors implicated in the surgical treatment of 522 patients with LM-CRC. Overall survival (OS) and disease-free survival (DFS) were calculated by the Kaplan Meier method, with log-rank comparisons between groups. Cox regression analysis was used to estimate the hazard ratio (HR).

**Results:**

522 patients (335 males (64.2%)) undergoing surgery for a first episode LM-CRC: 394 (76.2%) wedge resections, 19 (3.7%) anatomical segmentectomy, 100 (19.3%) lobectomy and 4 (0.8%) pneumonectomy. Group VATS: 93 patients (17.8%); Group Open (thoracotomy or sternotomy): 429 patients (82.2%). Significant differences were found between Group VATS and Open in the number of nodules observed in the preoperative CT (1.7 vs 2.0 p=0.004), nodule size >30mm in CT (2.2% vs 14.9% p=0.001), major anatomical resection performed (6.5% vs 22.8% p <0.001), higher pathological median nodule size (15.1mm vs 20.3mm p=0.002), lymph node involvement (N0 3.3% vs 27.2%; N1 0.0% vs 1.9%; N2 2.5% vs 3.7%; Nx 94.6% vs 67.2%, p <0.001) and postoperative morbidity (5.4% vs 17.9% p=0.002). There were not significant differences in OS and DFS between group VATS and Open (OS: 47 vs 56 months, p=0.16; DFS: 29 vs 28 months, p=0.9). Significant differences were found in OS and DFS and type of surgical resection performed, major anatomical resection vs wedge (OS median not reached vs 52.2 months, p=0.03; DFS median not reached vs 23.2 months, p<0.003).



**Conclusion:**

The type of surgical approach does not impact on OS and DFS of patients operated on LM-CRC. However, improved OS and DFS were observed in patients with anatomical pulmonary resection. Further studies are needed to confirm the impact of anatomical resection over wedge.

**Disclosure:** J. Hernandez: Grant from Ethicon to GECMP-CCR: statistical analysis

O-023

## ADJUVANT THERAPY IN STAGE IIIA-N2 NON-SMALL CELL LUNG CANCER AFTER NEOADJUVANT CONCURRENT CHEMORADIOTHERAPY FOLLOWED BY SURGERY

Sumin Shin<sup>1</sup>, H.K. Kim<sup>1</sup>, Y.S. Choi<sup>1</sup>, K. Kim<sup>2</sup>, J. Kim<sup>1</sup>, Y.M. Shim<sup>1</sup>

<sup>1</sup>Thoracic Surgery, Samsung Medical Center, Seoul, Korea

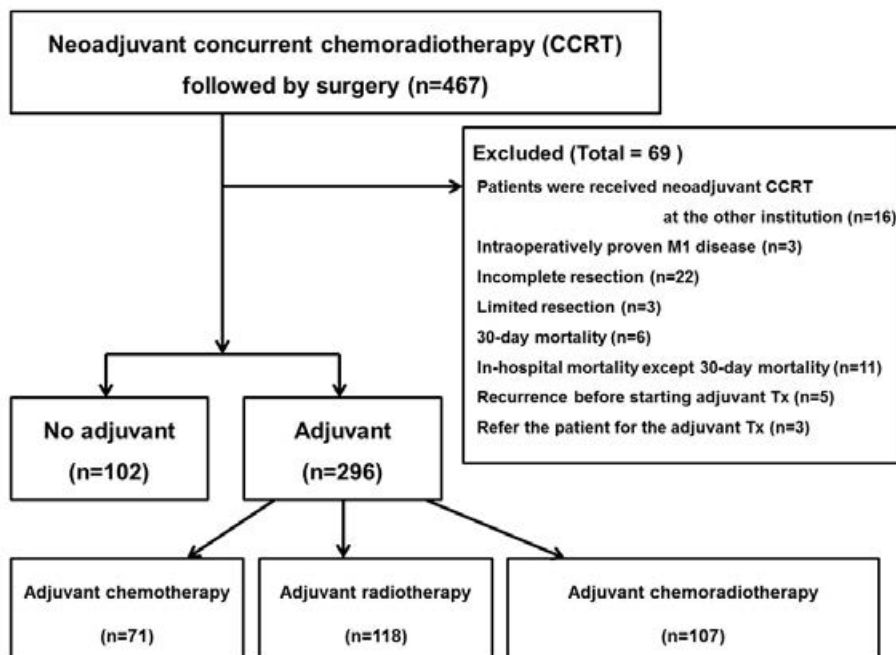
<sup>2</sup>Department of Thoracic and Cardiovascular Surgery, Seoul National University Bundang Hospital, Seongnam-si, Korea

### Objectives:

To determine whether adjuvant therapy improves survival in patients with stage IIIA-N2 non-small cell lung cancer (NSCLC) after neoadjuvant concurrent chemoradiotherapy (CCRT) followed by surgery.

### Methods:

We retrospectively reviewed the 467 consecutive patients with stage IIIA-N2 NSCLC who received neoadjuvant CCRT followed by surgery between 2004 and 2013. Of these, we identified 398 eligible patients (Figure 1) and their clinical outcomes were compared according to type of adjuvant therapy.



**Results:**

Total of 296 patients (74%) received adjuvant therapy including chemotherapy alone (n=71) radiotherapy alone (n=118) and both chemotherapy and radiotherapy (n=107). Adjuvant was not given to remaining 102 patients. Patients receiving adjuvant therapy were significantly younger ( $p=0.001$ ), and male predominant ( $p=0.014$ ) compared to patients not receiving adjuvant therapy. In regard to pathologic response, patients with higher ypTstage ( $p<0.0001$ ), ypNstage ( $p<0.0001$ ), and ypstage ( $p<0.0001$ ) received adjuvant therapy. The 5-year overall survival rate for patients with or without adjuvant therapy was 52.9% and 54.9%, respectively ( $p=0.369$ ). In multivariable analysis, older age (HR 1.024; 95% CI 1.004 ~ 1.045;  $p=0.020$ ), pneumonectomy vs ypstage II; HR 2.32; 95% CI 1.132-4.745;  $p=0.022$ ; pathologic complete response vs ypstage III; HR 2.58; 95% CI 1.387-4.793;  $p=0.003$ ) were significant for worse prognostic factor in terms of overall survival. Also, patients receiving chemotherapy (HR 0.41; 95% CI 0.22 ~ 0.773;  $p=0.006$ ) or chemoradiotherapy (HR 0.60; 95% CI 0.358-0.989;  $p=0.045$ ) showed significantly better survival compared to patients without adjuvant therapy.

**Conclusion:**

Adjuvant therapy was more commonly given to patients with poor pathologic findings, which is known to be a poor prognostic factor. Adjuvant therapy following neoadjuvant CCRT and surgery would be helpful to improve survival in selected patients.

**Disclosure:** No significant relationships.

**O-024****TUMOR LOCATION SHOULD BE CONSIDERED WHEN COMPARING N1 UPSTAGING BETWEEN VATS AND OPEN SURGERY FOR CLINICAL STAGE I NON-SMALL CELL LUNG CANCER**

*Alessia Stanzi, C. Dooms, J. Moons, W. Coosemans, L. Depypere, P. Nafteux, H. Van Veer, D. Van Raemdonck, P. De Leyn, H. Decaluwé  
Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

Nodal upstaging is a quality indicator for thoracic surgery. We studied the impact of primary tumor location on nodal upstaging in clinical stage I (cStage-I; TNM 7) NSCLC as this was not included in already published large retrospective series that showed lower N1 upstaging after VATS resections.

**Methods:**

Consecutive patients operated for cStage-I NSCLC were selected from a prospectively managed surgical database (Fig 1). Tumor location was classified as central or peripheral based on endobronchial visibility during videobronchoscopy. A nodal station mapping was drawn for each patient based on final pathologic examination.

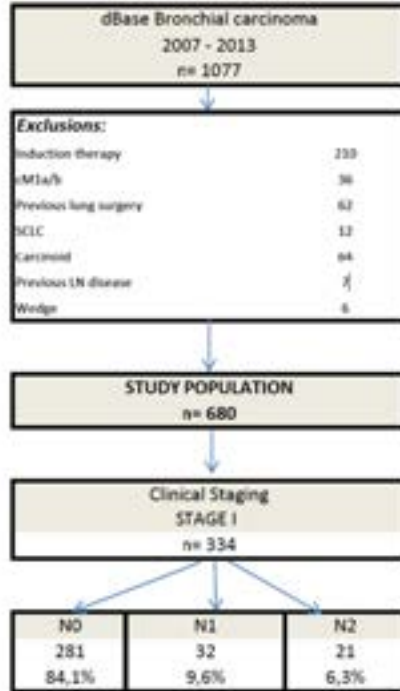
**Results:**

Between 2007-2013, 334 patients underwent resection for cStage-I NSCLC either by open thoracotomy (n=158) or by VATS (n=176; conversion rate 1.7%). Preoperative PET-CT and invasive mediastinal staging were performed in 100% and 24.6%, respectively. There were more central tumors in the open group (24.1%, n=38) compared to the VATS group (4.5%, n=8). There was no significant difference between the number (mean±SD) of nodal stations examined (open 5±1.9 versus VATS 5±1.7). Pathologic nodal upstaging was found in 16% (n=53) of cStage-I patients. Nodal pN1 and pN2 upstaging was 13.3% and 8.2%, respectively, for the open group, and 6.3% and 4.5%, respectively, for the VATS group. A binary logistic regression model (including tumor location, surgical technique, cStage-I, gender and histology) showed that only tumor location had a significant impact on pN1 upstaging (peripheral versus central; OR 0.18, p=0.001), while surgical technique had no impact (VATS versus open; OR 0.77, p=0.55).

**Conclusion:**

The number of lymph node stations examined during VATS resections is similar to open resections for cStage-I NSCLC. Tumor location is the only independent variable for pN1 upstaging in logistic regression analysis and should be included when comparing different surgical accesses for cStage-I NSCLC.





**BINARY LOGISTIC REGRESSION**

Dependent = pN1 nodal upstaging (Yes/No)

Variables in the Equation

	$\beta$	df	Sig.	Exp( $\beta$ )	95% C.I. for EXP( $\beta$ )	
					Lower	Upper
SCC (ref) vs. Non-SCC	0,226	1	0,63	1,25	0,50	3,14
cT2a (ref) vs. cT1a/1b	0,674	1	0,12	1,96	0,83	4,64
Male (ref) vs. Female	-0,562	1	0,23	0,57	0,23	1,42
VATS (ref) vs. Open	-0,268	1	0,55	0,77	0,32	1,83
Peripheral (ref) vs. Central	-1,735	1	<b>0,001</b>	0,18	0,07	0,47
Constant	-0,92	1	0,18	0,40		

**Disclosure:** No significant relationships.

**O-025****KRAS MUTATION PREDICTS WORSE OVERALL SURVIVAL IN CLINICAL STAGE IIIA LUNG ADENOCARCINOMA PATIENTS TREATED WITH INDUCTION CHEMOTHERAPY FOLLOWED BY SURGERY**

Kei Suzuki, R.T. Ripley, V. Rusch, B. Park, P. Adusumilli, J. Huang, M. Bains, R. Downey, N. Rizk, C. Sima, D. Jones

*Thoracic Surgery, Memorial Sloan Kettering Cancer Center, New York, United States of America*

**Objectives:**

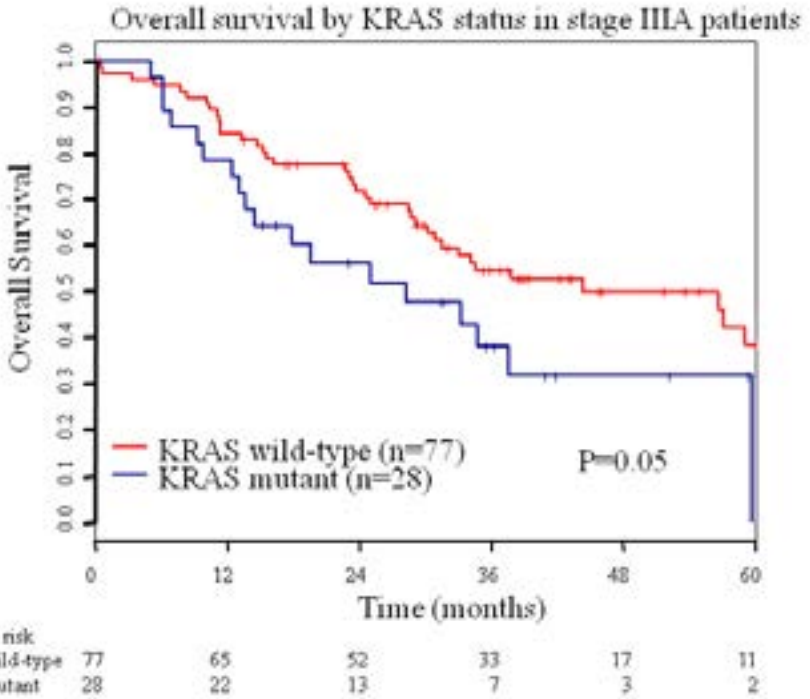
We hypothesized that tumor EGFR and KRAS status have prognostic and/or predictive value in patients with surgically resectable locoregionally advanced lung adenocarcinoma (LAC) treated with induction chemotherapy followed by resection.

**Methods:**

We performed a retrospective review of a prospective, single-institution database (1/1/2007–12/31/2012) and identified 157 patients (F=88, M=69) with clinical stage II (n=42) or III (n=115) LAC who underwent induction chemotherapy followed by surgery. All but 1 received platinum-based doublet induction chemotherapy. Endpoints included overall survival (OS) and recurrence-free survival (RFS). Log-rank test and Cox proportional hazards regression were used to assess tumor molecular status, OS and RFS, and the following factors: (1) TNM down-staging, (2) tumor metabolic response (defined as >50% decrease in tumor standardized uptake value on PET), and (3) pathologic N2 nodal clearance.

**Results:**

Of the 157 patients, 18 (11%) had EGFR-activating mutations, and 45 (29%) had KRAS mutations. Smoking status was 27 (17%) never, 112 (71%) former, and 18 (11%) current; 89% had an R0 resection. Median OS was 37.8 months for the entire cohort. EGFR status was not prognostic for OS or RFS. KRAS status did not predict OS in the entire cohort; however, there was a trend for shorter OS among cIIIA patients with KRAS-mutant tumors (median OS, 44.2 months vs. 28.3 months [KRAS wild-type vs. mutant];  $p=0.05$ ; Figure). Among cIIIA patients, KRAS status showed a trend for prediction of RFS (median RFS, 18.3 months vs. 9.3 months [KRAS wild-type vs. mutant];  $p=0.10$ ). Tumor EGFR and KRAS status were not associated with TNM down-staging, tumor metabolic response, or N2 clearance.



**Conclusion:**

Among patients with cIIIA LAC treated with induction chemotherapy followed by surgery, KRAS mutation showed a trend for predicting shorter RFS and worse OS. Tumor EGFR and KRAS status were not predictive for N2 nodal clearance or tumor metabolic response.

**Disclosure:** No significant relationships.

O-026

**BILOBECTOMY FOR LUNG CANCER: CONTEMPORARY NATIONAL EARLY MORBIDITY AND MORTALITY OUTCOMES**

Pascal Thomas<sup>1</sup>, P-E. Falcoz<sup>2</sup>, A. Bernard<sup>3</sup>, F. Le Pimpec-Barthes<sup>4</sup>, J. Jougon<sup>5</sup>,  
L. Brouchet<sup>6</sup>, G. Massard<sup>2</sup>, M. Dahan<sup>6</sup>

<sup>1</sup>*Thoracic-Surgery North Hospital, APHM - Aix-Marseille University, Marseille, France*

<sup>2</sup>*Thoracic Surgery, NHC - Universty of Strasbourg, Strasbourg, France*

<sup>3</sup>*Thoracic Surgery, University of Dijon, Dijon, France*

<sup>4</sup>*Thoracic Surgery, HEGP - APHP, Paris, France*

<sup>5</sup>*Thoracic Surgery, Hôpital du Haut Leveque, Pessac, France*

<sup>6</sup>*Thoracic Surgery, Hôpital Larrey, Toulouse, France*

**Objectives:**

To determine contemporary early outcomes associated with bilobectomy for lung cancer and to identify their predictors using a nationally representative general thoracic surgery database.

**Methods:**

1831 patients who underwent elective bilobectomy for primary lung cancer between 01/01/2004 and 12/31/2013 were selected. Logistic regression analysis was performed on variables for mortality and major adverse events.

**Results:**

There were 670 upper and 1161 lower bilobectomies. VATS was seldom performed (n=36, 2%). Induction therapy and extended resection were performed in 293 (16%), and 279 patients (15.2%), respectively. Operative mortality was 4.8% (upper: 4.5% / lower bilobectomy: 5% - P=0.62), and significantly higher following extended procedures when compared with standard bilobectomy (4.3% vs. 7.5%; P=0.013). Pulmonary complications rate was 21.1%. Bronchial fistula occurred in 46 patients (2.5%), and pleural space complications in 296 (16.2%). Their respective incidence rates were significantly higher following lower than upper bilobectomy (3.5% vs. 0.7%; P<0.001 and 17.8% vs. 13.3%; P=0.007). At multivariate analysis, extended procedures (OR, 2.3; 95% CI, 1.03-5.31; P=0.04), ASA scores of 3 or greater (OR, 2.02; 95% CI, 1.33-3.07; P<0.001), and WHO performance status 2 or greater (OR, 1.47; 95% CI, 1.01-2.13; P=0.04) were risk predictors. Female gender (OR, 0.39; 95% CI, 0.19-0.80; P=0.01), overweight (OR, 0.91; 95% CI, 0.86-0.96; P = 0.001), and recent years of surgery (OR, 0.91; 95% CI, 0.84-0.99; P = 0.02) were protective. Predictors of bronchial fistula were male gender, underweight BMI category, lower bilobectomy, and longer operative times. Male gender, underweight BMI category, and longer operative times were also predictors of pulmonary complications, together with highest ASA scores, and lowest FEV1 values.

**Conclusion:**

Bilobectomy still carries substantial risks of operative mortality, although overall results improved with time. Lower bilobectomy exposes the patient to the risks of bronchial fistula and pleural space complications, and underweight and low FEV1 to pulmonary complications.

**Disclosure:** No significant relationships.



O-027

**PERFORMING SUBLOBAR RESECTION INSTEAD OF LOBECTOMY COMPROMISES THE SURVIVAL OF STAGE I NON-SMALL CELL LUNG CANCER PATIENTS 80 YEARS OF AGE AND OLDER**

B. Gulack<sup>1</sup>, Chi-Fu Jeffrey Yang<sup>1</sup>, P. Speicher<sup>1</sup>, H.V. Kara<sup>2</sup>, T. D'Amico<sup>1</sup>, M. Berry<sup>3</sup>, M. Hartwig<sup>1</sup>

<sup>1</sup>*Department of Surgery, Duke University Medical Center, Durham, United States of America*

<sup>2</sup>*General Thoracic Surgery, Marmara University, Kadikoy-Istanbul, Turkey*

<sup>3</sup>*Falk Cardiovascular Research Center, Stanford University, Stanford, United States of America*

**Objectives:**

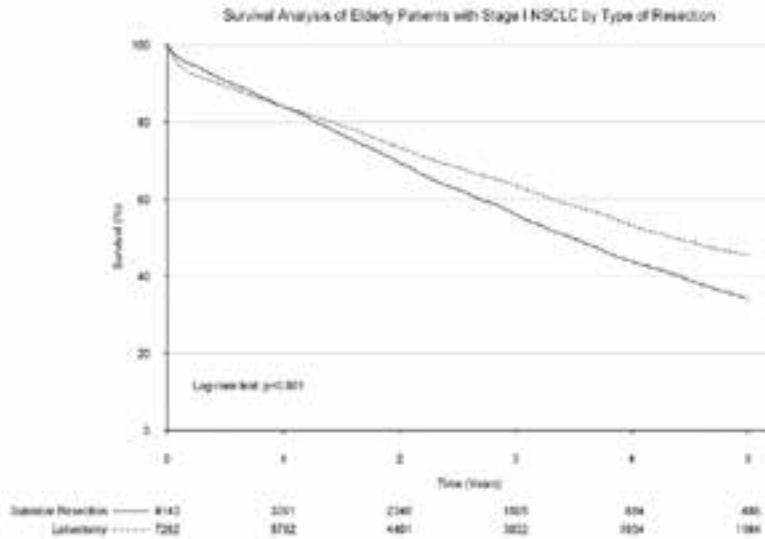
This study was performed to determine if the known survival benefit of lobectomy over sublobar resection for stage I Non-Small Cell Lung Cancer (NSCLC) is maintained in the very elderly.

**Methods:**

Stage I NSCLC patients in the National Cancer Database from 2003-2011 who underwent a lobectomy or a sublobar resection and who were 80 years of age or older were selected. The association of resection type and outcomes was evaluated with Kaplan-Meier analysis and Cox proportional hazards regression modeling. Sub-group analyses of patients with stage IA tumors, a Charlson/Deyo comorbidity index of 2 or greater, and of patients age 85 years or older were also performed.

**Results:**

11,405 patients met study criteria, of which 4,143 (36.3%) underwent a sublobar resection. Five-year survival was significantly better for patients who underwent a lobectomy as compared to a sublobar resection (45.5% vs 34.1%,  $p < 0.001$ , Figure). Because the survival curves crossed and therefore violated the proportional hazards assumption, the adjusted analysis was divided into an early and late period to adjust for time-varying effects. After adjustment, lobectomy was not significantly associated with mortality through six months (HR: 1.08, 95% CI: 0.95, 1.23) but then a significant survival benefit after six months (HR: 0.66, 95% CI: 0.62, 0.70) as compared to a sublobar resection. Lobectomy remained associated with significantly improved 5-year survival over sublobar resection for patients with stage IA cancers (49.0% vs 35.6%,  $p < 0.001$ ) as well as for patients 85 years of age or older (38.9% vs 30.4%,  $p = 0.014$ ), but not for patients with a Charlson/Deyo comorbidity index of 2 or greater (31.4% vs 25.9%,  $p = 0.407$ ).

**Conclusion:**

Among patients 80 years of age or older with Stage I NSCLC, lobectomy provides a survival benefit over a sublobar resection, even for stage 1A tumors. However, this benefit is not seen in patients with severe comorbidities.

**Disclosure:** No significant relationships.



O-028

**DOES POST-OPERATIVE PNEUMONIA INFLUENCE LONG TERM OUTCOMES AFTER LOBECTOMY FOR NON-SMALL CELL LUNG CANCER?**

Sai Yendamuri, S. Garlanka, A. Battoo, M. Hennon, E. Dexter, M. Huang, C. Nwogu, A. Picone, T. Demmy, S. Dhillon  
*Thoracic Surgery, Roswell Park Cancer Institute, Buffalo, United States of America*

**Objectives:**

The most common significant morbidity after lobectomy for NSCLC is pneumonia. Little is known of the long term impact of post-operative pneumonia (POP) on long term survival and oncological outcomes.

**Methods:**

Peri-operative and oncological data of all patients undergoing lobectomy for NSCLC in a contemporary period (2008-2012) was obtained from the institutional STS database and the cancer registry. Patients with two lung cancers or incomplete data were excluded. The association between overall survival and recurrence free survival with POP was assessed by univariate and multivariate analyses.

**Results:**

322 patients were included. Mean age = 65.7 yrs; 62.7% female. POP rate was 8.1%. On univariate analysis, overall survival was significantly decreased with POP (Mean of 36 vs 40 months;  $p=0.04$ ), whereas recurrence free survival was not associated with POP ( $p=0.22$ ) (Figure 1A,B). On multivariate modeling of overall survival including age, gender, race, AJCC staging and POP, only age ( $p=0.01$ ), gender ( $p=0.01$ ), stage ( $p<0.01$ ) and POP ( $p=0.02$ ) were significantly associated with overall survival. Similar modeling for recurrence free survival retained only stage ( $p<0.01$ ) and POP ( $p=0.06$ ) as significant variables (Figure 1C,D).

**Conclusion:**

Post-operative pneumonia is associated with worse overall survival and may be associated with worse recurrence free survival in patients undergoing lobectomy for NSCLC. Studies to assess the impact of POP reduction on oncological outcomes are necessary.

**Disclosure:** No significant relationships.

**O-029****A MODIFIED MODEL FOR PREOPERATIVELY PREDICTING MALIGNANCY OF SOLITARY PULMONARY NODULES: AN ASIAN COHORT STUDY**Bin Zheng, C. Chen*Thoracic Department, Fujian Medical University Union Hospital, Fuzhou, China***Objectives:**

With the recent widespread use of computed tomography, interest in ground glass opacity pulmonary lesions has increased. We aimed to develop a model for predicting the probability of malignancy in solitary pulmonary nodules.

**Methods:**

846 patients with newly discovered solitary pulmonary nodules referred to Fujian Medical University Union Hospital were assessed. Data on 18 clinical and 13 radiological variables were collected. Two-thirds of the patients were randomly selected to derive the prediction model (derivation set); the remaining one-third provided a validation set. The lesions were divided according to proportion of ground glass opacity ( $\geq$  or  $<50\%$ ). Univariate analysis of significant covariates for their relationship to the presence of malignancy was performed. An equation expressing the probability of malignancy was derived from these findings and tested on data from the validation group. Receiver operating characteristic curves were constructed using the prediction model and the Mayo Clinic model.

**Results:**

In lesions with  $<50\%$  ground glass opacity, three clinical characteristics (age, presence of symptoms, total protein) and three radiological characteristics (diameter, lobulation, calcified node[s]) were independent predictors of malignancy. In lesions with  $\geq 50\%$  ground glass opacity, two clinical characteristics (sex, FEV1%) and two radiological characteristics (diameter, calcified node[s]) were independent predictors of malignancy. Our prediction model was better than the Mayo Clinic model to distinguish between benign and malignant solitary pulmonary nodules ( $P < 0.05$ ).

**Conclusion:**

Our prediction model could accurately identify malignancy in patients with solitary pulmonary nodules, especially in lesions with  $\geq 50\%$  ground glass opacity.

**Disclosure:** No significant relationships.



**MONDAY, 1 JUNE 2015****13:30 - 15:30****PEDIATRIC CONGENITAL THORACIC MALFORMATIONS  
SESSION****F-030****OUTCOMES FOLLOWING REVISION PECTUS EXCAVATUM REPAIR IN  
THE ADULT**Jonathan C Yeung<sup>1</sup>, J. Ribas M. De Campos<sup>2</sup>, M.A. Ko<sup>1</sup>, M. Blitz<sup>1</sup>, C. Compeau<sup>1</sup><sup>1</sup>*Thoracic Surgery, University of Toronto, Toronto, Canada*<sup>2</sup>*Thoracic Surgery, University of São Paulo, São Paulo, Brazil***Objectives:**

Surgical repair of pectus excavatum is generally undertaken before adolescence in order to avoid the ossification and possible worsening of the defect which occurs with puberty. However, an unsatisfactory result can occur either primarily or as a result of pubertal changes, requiring revision surgery in adult life. We review the outcomes of revision pectus surgery at two adult centers with experience in both Nuss and Ravitch procedures for pectus repair.

**Methods:**

Retrospective data on revision pectus surgery were collected at two adult centers over a period of 2005-2014. Variables collected included demographics, operative details and outcomes from the first and second operation, and satisfaction following the revision operation. Using our pectus repair database, a 1:1 cohort of sex, age, and procedure matched patients who underwent an index pectus operation was generated as a control.

**Results:**

Approximately 350 pectus operations were performed at the two sites over the study period. Seventeen were revision. Indication for reoperation was recurrence in 13 (76%) and resultant asymmetrical pectus carinatum in 4 (24%). Median age at first operation was 15 (4-33) and re-operation was 20 (14-35). Median time between operations was 7 years (1-23). The initial operation was Ravitch in 11 (65%) and Nuss in 6 (35%). Six (35%) patients underwent Ravitch after Nuss procedure and 11 (65%) patients had Nuss after Ravitch procedure. Significant adhesions were encountered in 3 (18%) patients, all Nuss after Ravitch. Complications included Nuss bar migration (6%), chest wall hematoma (6%), persistent pain (6%) and wound infection (6%). Sixteen (94%) patients were satisfied with the final outcome. When compared to the control cohort, median length of stay ( $p=0.94$ ) and complication rate ( $p=.99$ ) were similar.

**Conclusion:**

Revision pectus excavatum surgery in the adult is safe and effective. A Nuss procedure can be revised with a Ravitch and vice-versa. Therefore, chest wall reconstructive surgeons need to be experienced with all surgical techniques to comprehensively manage patients with index or recurrent pectus excavatum.

**Disclosure:** No significant relationships.

## F-031

**THE IMPROVEMENT OF EXERCISE CAPACITY AFTER SURGICAL CORRECTION OF PECTUS CARINATUM IS ASSOCIATED WITH REVERSAL OF DYNAMIC HYPERINFLATION**

Ghazi Elshafie<sup>1</sup>, A. Aliverti<sup>2</sup>, P. Rajesh<sup>1</sup>, R. Steyn<sup>1</sup>, E. Bishay<sup>1</sup>, M. Kalkat<sup>1</sup>, B. Naidu<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Heart of England Foundation Trust, Birmingham, United Kingdom*

<sup>2</sup>*Dipartimento di Elettronica Informazione e Bioingegneria, Politecnico di Milano, Milan, Italy*

**Objectives:**

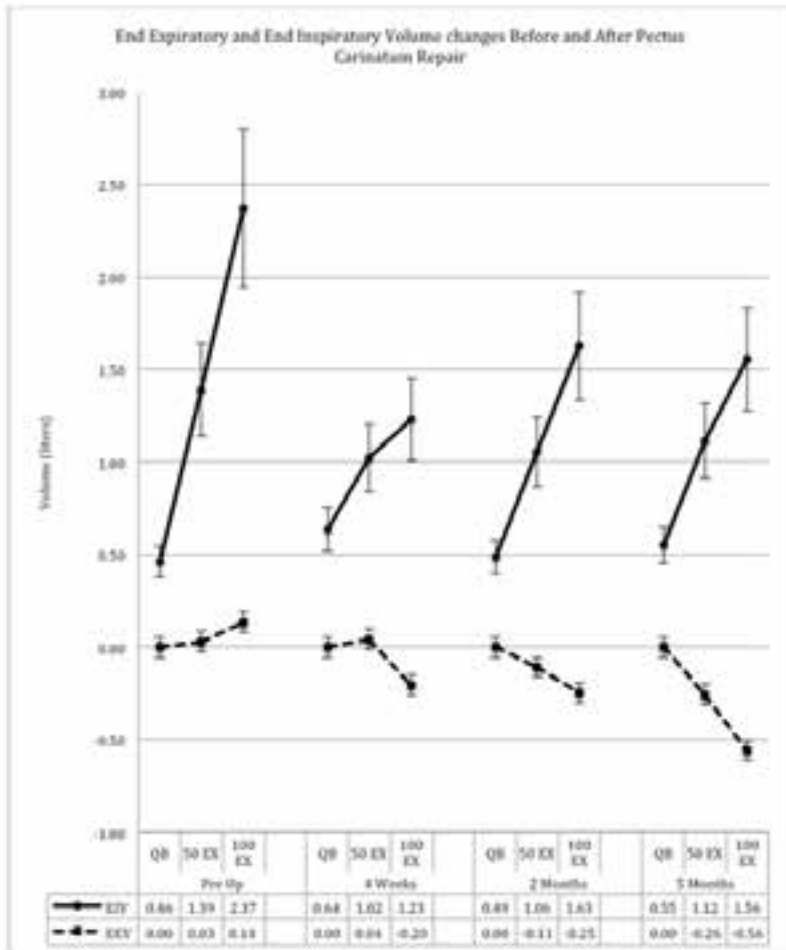
There is contradictory evidence regarding improvement in dyspnea and exercise tolerance following corrective surgery for pectus carinatum. It is even more unclear as to the mechanism of any improvement. Thus we observed the changes in chest wall function in response to an incremental load exercise before and after surgery.

**Methods:**

Using Optoelectronic Plethysmography, total and regional chest wall volumes were measured in 3 male patients with pectus carinatum who underwent a Ravitch procedure. Rib cage and abdominal volumes were recorded at rest and during exercise (incremental cycle ergometry), before and after surgery in conjunction with spirometry.

**Results:**

Our results shows that these patients end expiratory volume (EEV) increased by 14 +/- 0.4 % compared to quiet breathing during maximal exercise before surgery ( $P < 0.002$ ). This air trapping during exercise or dynamic hyperinflation was corrected after surgery. Postoperatively their EEV decreased during 100% exercise by 2.3 +/- 1.4 % at 5 months respectively ( $P 0.001$ ) (figure 1). The end inspiratory volume did not change significantly. This was associated with a 38 % increase in exercise time 5 months after surgical correction ( $P < 0.05$ ).



**Figure 1:** The Change in end inspiratory volume (EIV) and end expiratory volume. (EEV) at quiet breathing (QB), 50% and 100% exercise (50 EX)(100 EX), pre and post operatively.

**Conclusion:**

This is the first published data to show dynamic hyperinflation in pectus carinatum patients and the beneficial effects of corrective surgery. This was associated with a significant improvement in exercise capacity after surgery. Therefore, we conclude that improvement in exercise capacity early after surgery is likely due to correction of dynamic hyperinflation. The longer term effects on chest wall function are yet to be defined.

**Disclosure:** No significant relationships.

## F-032

**PLEURAL EMPYEMA TREATMENT IN CHILDREN: SIMPLE PLEURAL DRAINAGE OR VIDEOTHORACOSCOPY? CONTROLLED CLINICAL TRIAL**

E.N. Hasimoto, F.N. Hasimoto, Daniele Cristina Cataneo, A.J.M. Cataneo

*Department of Surgery and Orthopedic, Post Graduate Program in General Basis of Surgery - São Paulo State University (UNESP), Botucatu, Brazil*

**Objectives:**

To analyze cases of parapneumonic pleural empyema in children undergoing chest tube drainage alone or early videothoracoscopy in our service in order to determine the conclusive factors in a favorable treatment outcome.

**Methods:**

Prospective controlled trial. All children younger than 10 years old who were diagnosed with pleural empyema were subjected to two different types of random interventions for chest tube drainage: the TUBE group underwent closed pleural drainage alone and VATS group underwent videothoracoscopy (VATS) and chest tube drainage.

**Results:**

Fifty four patients aged seven months to 10 years old with a diagnosis of empyema were analyzed. Male gender was predominant (54%), right hemithorax was the most affected (28 patients) and the duration of clinical symptoms ranged from one to 30 days. Thirty two patients were previously treated with antibiotics and in 22 % of cases bacterioscopy and / or culture were positive and the most common agent was *Streptococcus pneumoniae* (16%). Twenty eight children underwent chest tube drainage and 26 underwent VATS. The variables age, history time and pH, LDH, glucose of the pleural fluid showed no significant differences. The duration of chest tube drainage was significantly lower in patients undergoing VATS ( $4.46 \pm 1.79$  vs  $10.36 \pm 5.16$  days) ( $p < 0.001$ ). The necessity for relocating the chest tube was higher in the TUBE group (RR = 0.32 OR = 0.25  $p = 0.09$ ) and the need for another surgical approach was also higher in this group (0 vs 17.9%  $p = 0.02$ ).

**Conclusion:**

The treatment of parapneumonic empyema in children was more effective in group treated with the aid of VATS, once patients remain with the chest tube for a shorter period of time, don't need another surgery and have less necessity for re-intervention or changing the antibiotic therapy after the procedure.

**Disclosure:** No significant relationships.



F-033

**MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM IN PATIENTS WHO HAD UNDERGONE UNSATISFACTORY RAVITCH OPERATION**K. Kaynak<sup>1</sup>, A. Onen<sup>2</sup>, M. Bilgin<sup>3</sup>, V. Karaçam<sup>2</sup>, A. Demirkaya<sup>4</sup>, E. Hekimoglu<sup>1</sup>, Akif Turna<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, Istanbul University, Cerrahpasa Medical Faculty, Istanbul, Turkey*<sup>2</sup>*Department of Thoracic Surgery, Dokuz Eylul University Medical Faculty, Izmir, Turkey*<sup>3</sup>*Department of Thoracic Surgery, Erciyes University School of Medicine, Kayseri, Turkey*<sup>4</sup>*Department of Thoracic Surgery, Acıbadem University Atakent Hospital, Istanbul, Turkey***Objectives:**

Minimal invasive surgical repair of chest wall deformities has become a standard practice. However, the role of minimal invasive surgery has not been revealed in the patients who were treated by open surgery previously.

**Methods:**

A total of 970 patients underwent minimally invasive repair of pectus excavatum between January 2010 and June 2014 in 3 centers. Fifty-five patients (5.6%) (42 males and 13 females) had a previous unsatisfied open surgery (Ravitch or modified Ravitch technique). The average age was 21.7 (range; 9-44) years. The mean Haller index was 3.35 (range; 2.1-6.2). Operation time, hospital stay and complications were compared between patients who had primary minimal invasive (P) and minimally invasive repair after Ravitch operation (Redo).

**Results:**

Average operation time was 80.4 minutes (range; 30-150 min) in redo group, whereas it was 40.6 minutes (range; 25-90 min) minutes in group P. Duration of operation was longer in redo group ( $p=0.01$ ). There was no mortality in either groups. In redo group, single bar was placed in 4 patients (%7.3), whereas two bars were utilized in 51 patients (92.7%). Nine patients (16.4%) had complications. The pectus bars were removed in 22 patients (%40) in redo group. There were no differences in terms of hospital stay and complication rate between two groups ( $p=0.22$  and  $p=0.14$  respectively).

**Conclusion:**

Minimally invasive repair seems to be a safe and effective procedure despite longer operation time in previously in patients who had previously undergone unsatisfied open repair.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****15:30 - 17:00****SESSION V: YOUNG INVESTIGATORS AWARD****F-034****SURGICAL TREATMENT OF THYMIC EPITHELIAL TUMORS WITH PLEURAL DISSEMINATION: MID-TERM RESULTS OF A RETROSPECTIVE, MULTI-CENTER STUDY**

Geoffrey Brioude<sup>1</sup>, D. Fabre<sup>2</sup>, D. Trousse<sup>1</sup>, N. Langer<sup>2</sup>, S. Hamdi<sup>2</sup>, A. Gomez-Caro<sup>2</sup>, P. Thomas<sup>1</sup>, E. Fadel<sup>2</sup>

<sup>1</sup>*Service de Chirurgie Thoracique, North University Hospital-Aix-Marseille, Marseille, France*

<sup>2</sup>*Service de Chirurgie Thoracique et Vasculaire, Centre Chirurgical Marie-Lannelongue, Le Plessis Robinson, France*

**Objectives:**

The optimal strategy for the treatment of pleural dissemination in thymic epithelial tumors remains controversial, although benefits from complete surgical resection have been reported. The objective of this retrospective study was to analyze the mid-term results of surgical management of thymic epithelial tumors with pleural dissemination in two high-volume, French centers.

**Methods:**

54 consecutive patients, who underwent surgery for stage IV thymic tumors with pleural dissemination or recurrence between January 2000 and December 2013, were retrospectively analyzed. The primary outcome was overall survival. Secondary outcomes included recurrence-free survival and perioperative morbidity and mortality.

**Results:**

54 consecutive patients, of whom 21 had myasthenia gravis, were included in the study. Indications for surgery were stage IV disease in 36 patients and pleural recurrence in 18 patients. Pleuropneumonectomy was performed in 19 patients due to extended pleural disease. Using Kaplan-Meier analysis, the overall survival was 79.4% at both 5- and 10-years, and recurrence-free survival was 42.9% at 5-years. The number of metastasis (>10) (p=0.014) and need for pleuropneumonectomy (p=0.006) were predictive of decreased survival. The size of the metastasis and presence of primary or secondary pleural dissemination did not predict patient outcome. No factors were found that predicted recurrence-free survival. Perioperative mortality occurred only among patients requiring pleuropneumonectomy, with a 30-day mortality of 15% (3/19) and 90-day mortality of 26% (5/19). Postoperative morbidity in this subgroup was 52%. No factors were found that predicted perioperative mortality in pleuropneumonectomy patients. Importantly, myasthenia gravis was the only identified risk factor for developing a bronchopleural fistula.



**Conclusion:**

Surgical management of thymic epithelial tumors with pleural dissemination results in long-term survival. The number of resected metastasis and need for pleuropneumonectomy predict worsened long-term outcomes.

**Disclosure:** No significant relationships.

F-035

**MULTIMODALITY TREATMENT OF STAGE II THYMIC TUMORS**

Carolina Carillo<sup>1</sup>, M. Anile<sup>1</sup>, D. Diso<sup>1</sup>, I. Onorati<sup>1</sup>, S. Mantovani<sup>1</sup>, E. Russo<sup>1</sup>, Y. Pecoraro<sup>1</sup>, T. De Giacomo<sup>1</sup>, A.M. Ciccone<sup>1</sup>, F. Longo<sup>2</sup>, D. Vitolo<sup>3</sup>, E. Rendina<sup>1</sup>, F. Venuta<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University of Rome Sapienza, Rome, Italy*

<sup>2</sup>*Oncology, University of Rome Sapienza, Rome, Italy*

<sup>3</sup>*Pathology, University of Rome Sapienza, Rome, Italy*

**Objectives:**

Stage II thymic tumors are easily removed, even when the capsula and adjacent mediastinal tissue are macroscopically involved; however, also at this stage, recurrence may occur, particularly for B2, B3 and C tumors. The criteria for the administration of adjuvant therapy remain controversial and it is unclear whether patients with stage II thymic tumors may benefit from it. In 1989 we started a multimodality approach for stage II thymic tumors including adjuvant chemo-radiotherapy based on histology.

**Methods:**

We compared 88 consecutive patients with stage II thymic tumors treated from 1989 to 2013 with adjuvant treatment (group A) with 27 patients treated with surgery alone before 1989 (group B). After surgery patients with B and C histological subtypes received mediastinal radiation therapy (40-55 GY) and chemotherapy (PAC regimen).

**Results:**

The mean age was 57±16 years and 48±13 years, respectively. Thirty-two patients (36%) had myasthenia gravis in Group A and 10 (37%) in group B. Two patients received induction chemotherapy (PAC). All patients underwent complete surgical resection. Fifty-four patients (61%) received post-operative chemotherapy and radiotherapy, two (2%) patients only adjuvant chemotherapy and three (3%) patients only post-operative radiation; they all showed B2, B3 or C histology. Five-year and 10-year survival were 96%±2% and 83.4%±5% in group A and 85.2%±7% and 78%±8% in group B. Recurrence was observed in 5 patients (5.7%) in Group A and in 9 (33%) in Group B (p<0.0001). Thymoma-free 5 and 10-year survival were 94%±2% and 92%±3% in Group A and 96%±3% and 87%±7% in Group B (p=0.04).

**Conclusion:**

The administration of adjuvant treatment for B and C stage II thymic tumors contributes to prevent recurrence and increase long-term survival.

**Disclosure:** No significant relationships.





F-036

**ISOLATED LOCAL RECURRENCE OR SOLITARY SOLID ORGAN METASTASIS AFTER ESOPHAGECTOMY FOR CANCER IS NOT THE END OF THE ROAD**

Lieven Depypere, J. Moons, W. Coosemans, G. Decker, T. Lerut, H. Van Veer, P. De Leyn, P. Nafteux

*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

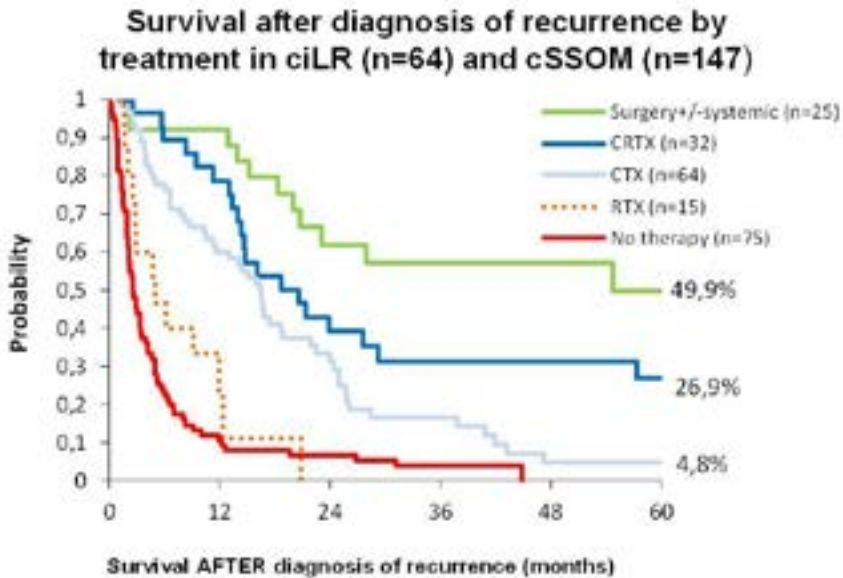
Recurrent disease after esophagectomy bears an infaust prognosis, especially when multiple recurrences are present. But little is known about survival in limited recurrence (solitary locoregional or solid organ metastasis). Herein we report our experience with these subgroups.

**Methods:**

We analyzed 1754 consecutive patients surgically treated with curative resection for esophageal cancer between 1990 and 2012. Clinical isolated local recurrence (ciLR) was defined as solitary lymph-node recurrence confined to one compartment (cervical, thoracic or abdominal, within or outside surgical dissection-field) at clinical staging. Clinical solitary solid organ metastasis (cSSOM) was defined as metastasis in a resectable solid organ, i.e. liver/lung/brain/adrenal. Kaplan-Meier analysis was used to calculate survival.

**Results:**

Recurrent disease was observed in 765 patients (43.6%) with overall 5-year survival after diagnosis of 4.5%. Sixty-four patients (8.4%) showed ciLR and 147 (19.2%) cSSOM. Median time-to-recurrence was 16.9 months in ciLR and 9.7 months in cSSOM ( $p=0.0037$ ). Survival is significantly improved ( $p<0.0001$ ) when local therapy is possible. In 25 (12%) of ciLR or cSSOM patients, surgical therapy with or without systemic therapy, yielded a 5-year survival of 49.9% (median 54.8 months) after recurrence. When surgery was impossible or contraindicated, the combination of chemo-radiotherapy appeared to be superior to chemotherapy alone (respectively 26.9% versus 4.4% 5-year survival) or radiotherapy. A significant number of patients ( $n=75$  or 32%) did not receive any salvage treatment because of various reasons.

**Conclusion:**

Recurrent disease after esophagectomy is a common problem with poor overall survival. However prolonged survival can be obtained if the recurrent disease is limited to ciLR or cSSOM, in particular if surgery (+/- systemic therapy) can be performed (49.9% 5-year survival). In the remainder, combination of chemo-radiotherapy seems to offer the best option. Whenever possible, patients presenting with a ciLR or cSSOM should not be denied an option for salvage treatment with a perspective of prolonged survival.

**Disclosure:** No significant relationships.

F-037

**RELAPSE PATTERN AFTER MULTIMODALITY TREATMENT OF MALIGNANT PLEURAL MESOTHELIOMA**Arthur Kostron<sup>1</sup>, M. Friess<sup>1</sup>, R. Stahel<sup>2</sup>, W. Weder<sup>1</sup>, I. Opitz<sup>1</sup><sup>1</sup>*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*<sup>2</sup>*Oncology, University Hospital Zurich, Zurich, Switzerland***Objectives:**

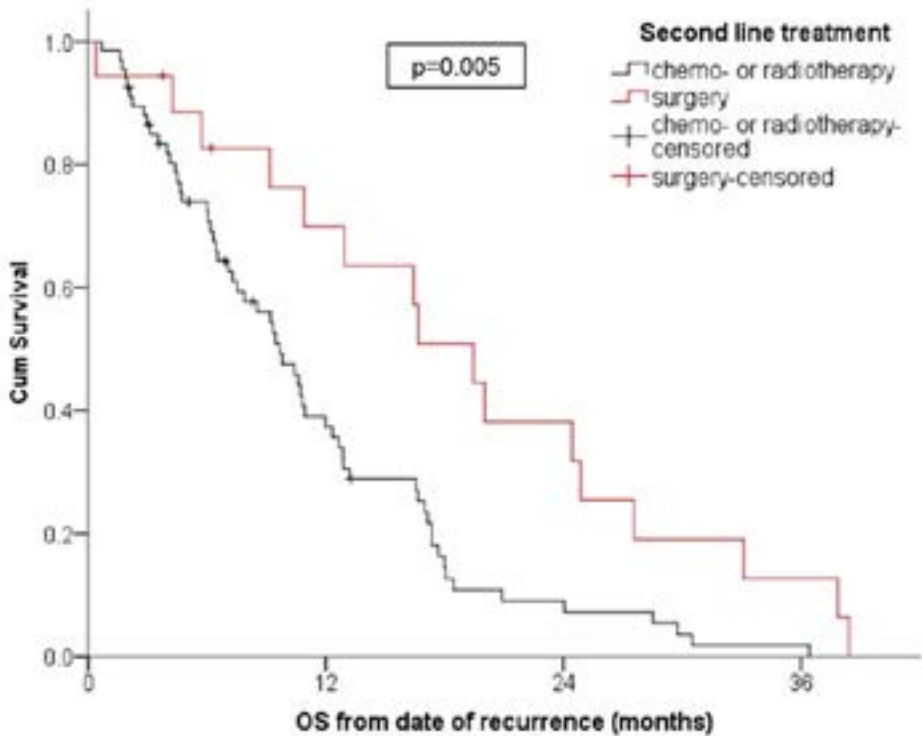
To analyse the relapse pattern of malignant pleural mesothelioma (MPM) in patients undergoing multimodality treatment. Due to its highly aggressive behaviour overall local recurrence rates is 50-100% depending on treatment modalities and tumour stage.

**Methods:**

Analysis of 119 patients (14 females) with recurrent MPM prospectively assessed that have previously undergone macroscopic complete resection (MCR) by either extrapleural pneumonectomy (n=108) or pleurectomy/decortication (n=11) after neoadjuvant chemotherapy. 59 patients received adjuvant radiotherapy.

**Results:**

The median time to relapse was 8.5 months after operation (95%CI: 7.5-9.6). The median overall survival (OS) after relapse was 7.3 months (95% CI: 4.8-9.8). Diagnosis of recurrence was obtained by serial imaging in 61 patients (51%) and by pathology in 51 patients (43%). Local recurrence alone was observed in 57 patients (48%), distant metastases alone in 29 patients (24%) and distant plus local recurrence in 32 patients (27%). Patient with local recurrence alone survived significantly longer compared to patients with distant alone and distant and local relapse (p=0.02). 85 patients (71%) received a further treatment after tumour relapse. Treatment options were chemotherapy (n=60, 50%), local radiotherapy (n=22, 19%) or local excision (n=18, 15%). Patients receiving any treatment survived significantly longer compared to patients not receiving therapy (p<0.0005). The median OS after local surgical treatment was significantly longer compared to patients receiving chemo- or radiotherapy (19.5 (95%CI: 13.7-25.2) vs. 9.7 (95%CI: 7.5-11.8), p=0.005) (Figure 1); however, this may represent a selection bias.

**Conclusion:**

Even after multimodality treatment and MCR, local recurrence remains a critical issue; however, surgical excision is feasible and has good long term outcome in selected patients.

**Disclosure:** No significant relationships.

F-038

**PRIMARY SARCOMATOID TUMORS OF THE LUNG: A PROGNOSTIC MULTICENTRE ANALYSIS OF 148 SURGICALLY TREATED CASES**

Filippo Lococo<sup>1</sup>, C. Rapicetta<sup>1</sup>, G. Cardillo<sup>2</sup>, A. Stefani<sup>3</sup>, S. Margaritora<sup>4</sup>, G. Leuzzi<sup>5</sup>, F. Carleo<sup>2</sup>, L. Ciavarella Petracca<sup>4</sup>, G. Rossi<sup>6</sup>, U. Morandi<sup>3</sup>, F. Facciolo<sup>5</sup>, G. Sgarbi<sup>1</sup>

<sup>1</sup>Unit of Thoracic Surgery, IRCCS Arcispedale S. Maria Nuova, Reggio Emilia, Italy

<sup>2</sup>Unit of Thoracic Surgery, San Camillo-Forlanini Hospital, Rome, Italy

<sup>3</sup>Unit of Thoracic Surgery, University of Modena and Reggio Emilia, Modena, Italy

<sup>4</sup>Department of General Thoracic Surgery, Catholic University, Rome, Italy

<sup>5</sup>Department of Surgical Oncology, Thoracic Surgery Unit, Regina Elena National Cancer Institute, Rome, Italy

<sup>6</sup>Unit of Pathology, University of Modena and Reggio Emilia, Modena, Italy

**Objectives:**

Sarcomatoid lung carcinoma (SaLC) is a very rare and aggressive subtype of non-small cell lung cancer (NSCLC). To better understand the long-term results after surgical treatment and the main prognostic factors of such rare entities, we have revisited the clinical records of patients affected by SaLC in a large multicentre surgical series.

**Methods:**

Among 6569 patients who underwent curative resection for NSCLC from 01/2003 to 12/2013 in 5 Institutions, 148 patients (2.2%) had sarcomatoid carcinoma. Clinical and pathological data were retrospectively reviewed. Kaplan-Meier method, log-rank test and Cox-regression analysis were used for the statistical analysis when indicated.

**Results:**

Mean age and male/female ratio were 66.6±9.9 yrs and 120/28, respectively. The main clinical, surgical and pathological features of the population are summarized in Table 1. Thirty-six pts (24.3%) had pathologic stage-I disease and 70 pts (47.3%) presented with mixed histological tumor (SaLC combined with NSCLC). The overall median and 5-year (LTS) survivals were 17 months and 11.3%, respectively. During follow-up, 101 patients (68.2%) experienced a relapse of disease (84 pts (57%) at distance). Log-rank analysis identified the administration of pre-op PET/CT scan (LTS: yes=17.9% vs no=5.5%; p=0.040), the surgical radicality (LTS: R0=13.2% vs R+ =0%, p<0.001), the pStage (LTS: p-I=13.2%, p-II=10.6%, p-III=6.3%, p-IV=0%; p<0.001) as prognostic factors in SaLC patients. Finally, Cox regression analysis confirmed the administration of pre-op PET/CT scan (p=0.021), the surgical radicality (p<0.001) and the p-Stage (p=0.022) as independent prognostic factors in such cohort of patients.

**Conclusion:**

Primary SaLC presented a poor prognosis after surgical treatment (overall 5-yr survival=11.3%), even in early stages (LTS: 13.2% in pStage-I). Such results imply that the role of surgery for primary SaLC is questionable and eventually limited (after an accurate preoperative

staging) to “early-stage” tumors only. In this framework, stronger efforts should be made for target therapies development for such rare entity.

Table 1. Clinical, surgical and pathological features of the sample

Features	Total sample=148
Age (Mean±SD)	66.6±9.9 yrs
Gender	
Male/ Female	120 (81%) / 28 (19%)
Side of Tumor	(84%)
Right/Left	84 (57%) / 64 (43%)
Pet/CT scan	
Yes	73 (51%)
No	73 (49%)
Pre-op Diagnosis	
Yes	76 (51%)
No	72 (49%)
Tumor size (Mean±SD)	3.8±3.1 cm
Induction Therapy	4 (2.7%)
Surgery	
Sub-lobar Resections	3 (2.4%)
Levatectomies/bidlobectomies	132 (89.2%)
Pneumonectomies	8 (5.4%)
Post-op Mortality/Complications	3 (2.0%) / 42 (28.4%)
Completeness of resection	
R0	141 (95.3%)
R+	7 (4.7%)
Pathological Staging	
I	36 (24.3%)
II	76 (51.3%)
III	33 (22.3%)
IV	10 (6.8%)
Lymph Nodal Involvement	
N0	93 (62.8%)
N1	23 (16.9%)
N2	24 (16.3%)
LPN removed (Mean±SD)	9.2±3.8
LPN involved (Mean±SD)	1.1±3.4
Histology*	
Pleomorphic	83 (56.1%)
Spindle Cell	17 (11.5%)
Giant Cell	6 (4.1%)
Blastoma	2 (1.4%)
Pathological features	
Mixed Forms (combined with NSCLC)	70 (47.3%)
Lymphatic Invasion	38 (25.7%)
Vascular Invasion	74 (50.0%)
Post-op Treatment	
CRT*	99 (66.9%)
RT*	43 (29.1%)
None	44 (29.7%)
Relapse of disease	
Local**	60 (40.5%)
Distant**	84 (56.8%)

\*41 (28.3%), 74 (50.0%), 14 (9.5%) patients received CR/RT, 99 (66.9%) patients received CR/RT and 44 (29.7%) patients received none of them

**Disclosure:** No significant relationships.



F-039

**REAL TIME MONITORING OF A VATS LOBECTOMY PROGRAM USING A SPECIFIC CARDIOPULMONARY COMPLICATIONS RISK-ADJUSTED CONTROL CHART**

Miriam Patella, A. Sandri, K. Papagiannopoulos, R. Milton, N. Chaudhuri, M. Kefaloyannis, A. Brunelli

*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

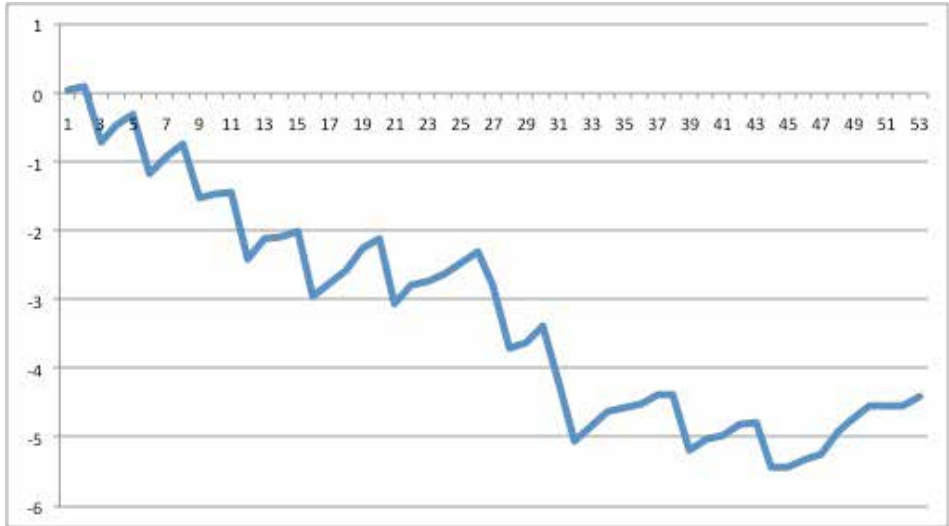
To develop a morbidity risk-model specific for VATS lobectomy to monitor internal performance.

**Methods:**

Retrospective analysis on prospectively collected data of 348 patients submitted to VATS lobectomy (August 2012-August 2014). Baseline and surgical variables were tested for a possible association with postoperative cardiopulmonary complications. Logistic regression and bootstrap resampling analyses were used to develop the risk model to calculate predicted morbidity of 50 consecutive patients (September 2014-November 2014). A risk-adjusted control chart was constructed to track down practice variation during this period. Patients were ordered by date of operation and assigned a score represented by the individual predicted morbidity: the plotted line goes up in case of absence of complication and goes down by the predicted morbidity minus 1 in case of complications. Over time, if outcomes are as expected based on the risk model, the plotted line will tend to be close to zero.

**Results:**

Cardiopulmonary complications and in-hospital/30 day mortality rates were 14% (47 cases) and 1.8% (6 cases) respectively. Age ( $p=0.006$ , coefficient 0.55, bootstrap frequency 76%) and  $ppoFEV1$  ( $p<0.001$ , coefficient -0.38, bootstrap frequency 98%) remained independently associated with cardiopulmonary morbidity after logistic regression and bootstrap analyses. The following risk logit model for cardiopulmonary morbidity after VATS lobectomy was generated:  $-3.17 -0.038XppoFEV1 +0.55Xage$ . The risk adjusted control chart showed a downward trend indicating a worse than expected performance in the audited period (Fig 1).

**Conclusion:**

The present analysis offers a methodological template for VATS lobectomy that helps to evaluate the surgical program. It aims to give a real-time monitoring with the possibility to compare the observed performance of the centre with the population-specific predicted one. Being reactive with the time, this method allows early detection of underperformance and implementation of critical changes in clinical practice.

**Disclosure:** No significant relationships.





F-040

## POSTOPERATIVE OUTCOME OF MINIMALLY INVASIVE SEGMENTECTOMY: VIDEO-ASSISTED THORACIC SURGERY VERSUS ROBOTIC-ASSISTED THORACIC SURGERY

Philippe Rinieri<sup>1</sup>, C. Peillon<sup>1</sup>, M. Salaün<sup>2</sup>, M. Bubenheim<sup>3</sup>, J. Mahieu<sup>1</sup>, J. Melki<sup>1</sup>, J. Baste<sup>1</sup>

<sup>1</sup>*General and Thoracic Surgery, Rouen University Hospital, Rouen, France*

<sup>2</sup>*Pneumology, Rouen University Hospital, Rouen, France*

<sup>3</sup>*Epidemiology and Public Health, Unit of Biostatistics, Rouen University Hospital, Rouen, France*

### Objectives:

Minimally invasive surgery is well accepted for lobectomies. However, video-assisted thoracic surgery (VATS) appears technically difficult for segmentectomy. Robotic-assisted surgery (RATS) could facilitate performance of segmentectomies. The objective of this study was to compare the early results of VATS and RATS.

### Methods:

Demographic, pre-, peri- and postoperative data have been prospectively collected since 2010 for VATS and 2013 for RATS. If a patient had multiple segmentectomies, only the first segmentectomy was included for the study. Perioperative outcomes from VATS and RATS segmentectomies were statistically compared with Freeman-Halton and Wilcoxon tests.

### Results:

Fifty-one patients were proposed to minimally invasive segmentectomy, three segmentectomies were converted to lobectomies (2 VATS and 1 VATS). Forty-eight segmentectomies (32 VATS and 16 RATS) were performed for 6 benign or infectious lesions, 8 preinvasive lesions, 3 minimally invasive adenocarcinomas, 16 invasive adenocarcinomas, 5 other lung cancers and 10 metastatic diseases. Four segmentectomies was performed in high-risk patients with pathological stage tumors > IA (3 pIB and 1 pIIA). Two conversions to thoracotomy were necessary for arterial injury, which was controlled with RATS but not with VATS. Patient characteristics, type of segment, preoperative bleeding, conversion to thoracotomy, operative time, postoperative complications, chest tube duration, postoperative stay and histology were similar in VATS and RATS groups.

### Conclusion:

The morbidity rate of minimally invasive segmentectomy is low and the short-term results are good. RATS provides the same results as VATS, even in initial robotic programs thanks to technical advantages. Efficacy and operative security seem optimal by RATS with no uncontrolled bleeding declared, but more data are mandatory to achieve firm conclusion. Also long-term oncologic outcomes are necessary to evaluate these new surgical practices.

**Disclosure:** C. Peillon: I organize VATS CLINICAL IMMERSION 5 times a year with the COVIDIEN MEDTRONIC group for French surgeons.

J. Baste: Links with Covidien, Ethicon and Intuitive: clinical immersion and procotoring: Minimal invasive courses.

**F-041****BIONOTE E-NOSE TECHNOLOGY MAY REDUCE FALSE POSITIVES IN LUNG CANCER SCREENING PROGRAMS**

Raffaele Rocco<sup>1</sup>, R. Antonelli Incalzi<sup>1</sup>, G. Pennazza<sup>1</sup>, M. Santonico<sup>1</sup>, C. Pedone<sup>1</sup>, C. Vernile<sup>1</sup>, G. Mangiameli<sup>1</sup>, A. La Rocca<sup>2</sup>, G. De Luca<sup>2</sup>, G. Rocco<sup>2</sup>, P. Crucitti<sup>1</sup>

<sup>1</sup>*Surgery, University Campus Biomedico, Rome, Italy*

<sup>2</sup>*Thoracic Surgery and Oncology, Istituto Nazionale Tumori, Fondazione Pascale, IRCCS, Naples, Italy*

**Objectives:**

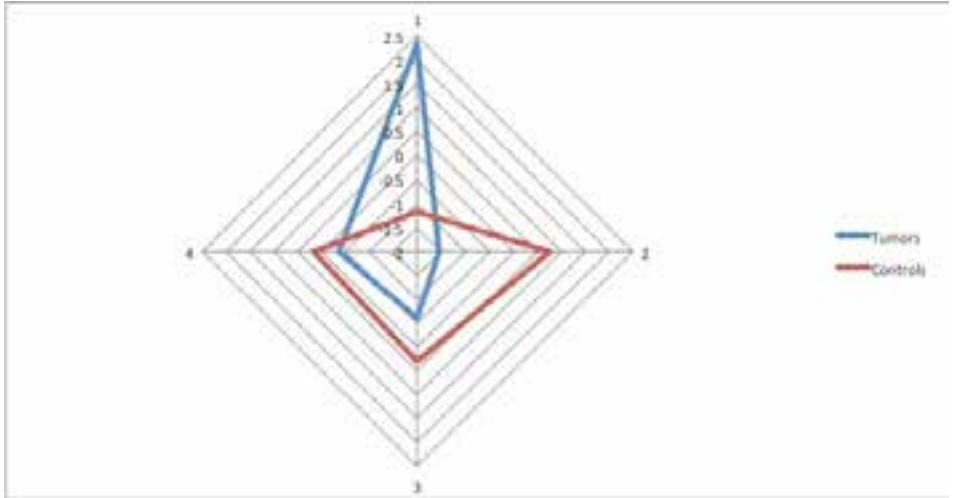
Breath composition may be suggestive of different conditions. E-nose technology has been used to separate volatile organic compounds (VOCs) in the breath of patients compared to the breath of healthy individuals. Bionote technology differs from cyranose based on a set of separate transduction features (ie, working principles, sensing material, and, array composition). Based on our previously published experience (PlosOne 2012; Lung Cancer 2010 and 2012; Sensors, 2013), we investigated the discriminating ability of BIONOTE in a high-risk population enrolled in a lung cancer screening program.

**Methods:**

Twenty-one individuals (7 diagnosed with lung cancer and 14 controls) were selected based on the attribution to the high risk category (ie, age, smoking status, COPD PlosOne 2012). We used a measure chain consisting of 1., a device named Pneumopipe (EU patent: EP2641537 (A1):2013-09-25) able to catch exhaled breath by an individual normally breathing into it and collect the exhalate onto an adsorbing cartridge; 2. an apparatus for thermal desorption of the cartridge into the sensors chamber; and, 3.a gas sensor array which is part of a sensorial platform named BIONOTE for the VOCs mixture analysis. Partial Least Square (PLS) has been used to build-up the model, with Leave-One-Out as cross-validation criterion.

**Results:**

Sensitivity and specificity were both 100% delineating a substantial difference between patients and healthy individuals (Fig.1). Each breath fingerprint analysis cost 10 euros.

**Conclusion:**

Our preliminary data show that BIONOTE technology may be used to reduce false positive rates resulting from lung cancer screening with LDCT in a cost-effective fashion. The model will be tested on a larger number of patients to confirm the reliability of these results.

**Disclosure:** No significant relationships.

## F-042

**CLINICAL IMPACT OF C-MET EXPRESSION AND MUTATIONAL STATUS IN PATIENTS WITH PRIMARY COLORECTAL CANCER LUNG METASTASES**

Thomas Schweiger<sup>1</sup>, V. Starkl<sup>1</sup>, C. Glogner<sup>1</sup>, O. Glück<sup>1</sup>, J. Jedamzik<sup>1</sup>, P. Birner<sup>2</sup>, W. Klepetko<sup>1</sup>, K. Hoetzenecker<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, Medical University of Vienna, Vienna, Austria*

<sup>2</sup>*Institute of Pathology, Medical University of Vienna, Vienna, Austria*

**Objectives:**

The c-MET tyrosine kinase is known to play a key role in tumor promotion in variety of cancers. The prognostic significance of c-MET pathway alterations has been previously described in primary colorectal cancer (CRC). However, data on the expression and genetic mutational status of CRC pulmonary metastases (PM) is lacking. We aimed to assess the clinical implications of alterations in the c-MET pathway in patients undergoing pulmonary metastasectomy.

**Methods:**

From 04/2009 to 11/2013 all patients with complete CRC lung metastasectomy were included in this study and prospectively followed-up. Tissue samples of 51 PM and 33 paired primary CRC were stained immunohistochemically for c-MET. Genetic alterations of c-MET were detected using an exome panel on a next generation sequencing platform.

**Results:**

IHC staining was successful in 50/51 (98.0%) of PM and in 33/33 (100%) of primary CRC. c-MET expression was significantly higher at the invasive front of the tumor compared to central tumor areas ( $p=0.020$ ). Increased expression levels of c-MET in PM were not significantly associated with a decreased time to lung recurrence ( $p=0.720$ ). However, patients with c-MET overexpression in PM had a significantly worse overall survival after metastasectomy ( $p=0.038$ ). Detailed results from the genetic mutational analysis will be presented at the meeting.

**Conclusion:**

To the best of our knowledge, this is the first structured evaluation of c-Met in the context of pulmonary metastasectomy for CRC. Our results suggest that overexpression of c-MET is associated with an impaired prognosis following complete resection. Moreover, this work provides a first rationale for the use of c-MET tyrosine kinase inhibitors in the future treatment of CRC lung metastases.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****16:00 - 18:00****ESTS-IASLC JOINT SESSION****F-043****THE PREDICTIVE VALUE OF RADIOLOGIC FEATURES OF GROUND-GLASS OPACITY ON TUMOR INVASIVENESS AND EGFR MUTATION**Jie Dai<sup>1</sup>, P. Zhang<sup>1</sup>, Y. Yang<sup>1</sup>, C. Wu<sup>2</sup>, S. Jiang<sup>3</sup>, X. Jia<sup>3</sup>, K. Fei<sup>4</sup>, J. Shi<sup>3</sup>, G. Jiang<sup>1</sup><sup>1</sup>Department of Thoracic Surgery, Shanghai Pulmonary Hospital Tongji University, Shanghai, China<sup>2</sup>Department of Pathology, Shanghai Pulmonary Hospital Tongji University, Shanghai, China<sup>3</sup>Department of Radiology, Shanghai Pulmonary Hospital Tongji University, Shanghai, China<sup>4</sup>Lung Cancer Center, Shanghai Pulmonary Hospital Tongji University, Shanghai, China**Objectives:**

Evaluation of ground-glass opacity (GGO) is a longstanding clinical problem. We aimed to investigate the computed tomography (CT) features correlating with the invasiveness of lung adenocarcinoma and to explore the imaging findings associated with epidermal growth factor receptor (EGFR) mutation in a series of GGOs.

**Methods:**

A total of 119 patients with a single GGO who were diagnosed pathologically as adenocarcinoma were retrospectively included. The solid volume proportion was calculated by semiautomatic algorithm. Histologic subtype was stratified into non-invasive lesions (NILs), including adenocarcinoma in situ and minimally invasive adenocarcinoma, and invasive pulmonary adenocarcinomas (IPAs). Multivariate logistic regression mode was conducted to identify the variables that could differentiate NIL from IPA and predict for an EGFR mutation.

**Results:**

There were 46 NILs and 73 IPAs. Among CT findings, IPAs were significantly larger diameter (16.3mm vs. 11.4mm,  $p<0.001$ ), higher solid volume proportion (8.2% vs. 0.9%,  $p<0.001$ ) and more frequently air bronchogram ( $p=0.002$ ), vascular invasion ( $p<0.001$ ), lobulated/irregular shape ( $p<0.001$ ), non-smooth margin ( $p<0.001$ ) and pleural tag ( $p<0.001$ ) in comparison to NILs. The multivariate logistic regression indicated that tumor maximal diameter (OR=1.252 [1.073-1.460]) and solid volume proportion (OR=1.458 [1.027-2.069]) were significant predictors of tumor invasiveness and the optimal cutoff values were 13mm and 1.3%, respectively. EGFR mutation was detected in 67 (56.3%) cases. GGOs with EGFR mutations were significantly larger diameter (13.4mm vs. 15.2mm,  $p=0.046$ ) and more frequently air bronchogram ( $p=0.001$ ) and non-smooth margin ( $p=0.021$ ) than did those with wide types. By multivariate logistic regression analysis, the air bronchogram (OR=7.834 [1.590-38.591]) was significantly associated with EGFR mutation even after the adjustment for patient's gender, age, and smoking history.

**Conclusion:**

Tumor maximal diameter and solid volume proportion were effective predictors of pathological invasiveness for pulmonary GGOs. In addition, an air bronchogram was well associated with EGFR mutation.

**Disclosure:** No significant relationships.



F-044

**SURGICAL RESULTS OF RADIOLOGICAL INVASIVE ADENOCARCINOMA WITH ADDITIONAL GROUND GLASS NODULES: COMPARISON WITH THE SOLITARY INVASIVE ADENOCARCINOMA**

Aritoshi Hattori, K. Suzuki, T. Matsunaga, K. Takamochi, S. Oh  
*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

Radiological invasive adenocarcinoma increasingly presents with synchronous, additional ground glass nodules (AGGNs). In contrast, surgical outcomes and the appropriate operative strategies in this situation remain unclear.

**Methods:**

Between 2008 and 2014, 473 patients underwent surgical resection for clinically node-negative lung adenocarcinoma less than 30mm in size with radiological invasive appearance. Radiological invasiveness was defined as a solid tumor with  $0.5 \leq \text{consolidation tumor ration (CTR)} \leq 1.0$  on thin-section computed tomography (CT).

**Results:**

Fifty-six (12%) patients showed dominant invasive adenocarcinoma lesion (DL) with AGGNs, whereas 417 (88%) showed solitary invasive adenocarcinoma lesion (SL). The mean number of AGGNs was 2.3 (range; 1-29). Thirty-four (61%) of DL showed radiologically mixed-GGO appearance, while 244 (59%) of SL revealed pure-solid on thin-section CT scan ( $p=0.0065$ ). Moreover, DL with AGGNs revealed oncologically less invasive compared with SL, indicating less presence of lymphovascular invasion (17% vs 33%;  $p=0.0098$ ), lower SUVmax level (3.12 vs 4.67;  $p=0.0035$ ), and earlier p-stage (89% vs 82% in p-stage I disease;  $p=0.0796$ ). Regarding the operative mode of DL with AGGNs, 50 (89%) underwent anatomical resection for DL. Initially unresected AGGNs have been developed in 14 (25%) patients. Among them, 4 patients have required staged surgical intervention for enlargement of AGGNs. The 5-year overall survival rates of DL with AGGNs and SL were 89.5% and 81.2% ( $p=0.2013$ ). A multivariate cox regression analysis revealed that tumor size, SUVmax level and consolidation status of DL or SL were significant prognostic factors for survival ( $p=0.0026, 0.0276, 0.0466$ ), whereas the presence of AGGNs was not ( $p=0.8364$ ).

**Conclusion:**

Radiological findings are independent significant prognostic factors in patients with clinically node-negative invasive adenocarcinoma, regardless of the presence of additional GGNs. Therefore, strict surgical management for dominant invasive lesion could be essential, while residual GGNs may not be involved in their survival due to their indolent nature.

**Disclosure:** No significant relationships.

**F-045****ADEQUACY OF STAGING NON-SMALL CELL LUNG CANCER - DUTCH LUNG SURGERY AUDIT**D J Heineman<sup>1</sup>, M. Ten Berge<sup>2</sup>, W.H. Schreurs<sup>1</sup><sup>1</sup>*Surgery, Medisch Centrum Alkmaar, Alkmaar, The Netherlands*<sup>2</sup>*DICA, Dutch Institute for Clinical Auditing, Leiden, The Netherlands***Objectives:**

Clinical staging of non-small cell lung cancer (NSCLC) determines the treatment that is offered to a patient. In some studies the agreement between clinical and pathological staging is as low as 50%, others publish results as high as 91%. In the Netherlands the Dutch Lung Surgery Audit (DLSA) started in 2012 and registered the cTNM and pTNM of almost all NSCLC patients receiving surgery. The objective of this study is to determine the adequacy of pre-operative staging of non-small cell lung cancer and identify risk factors for inadequate staging.

**Methods:**

We used retrospective data from the DLSA in 2013. We compared cTNM and pTNM and identified risk factors. We analysed the over and under staged groups and determined the amount of invasive staging methods used in under staged patients. We used chi square tests and logistic regression analysis to analyse the data.

**Results:**

1331 patients were included who all had primary resections for stage IA-IV non-small cell lung cancer without neoadjuvant treatment. 704 patients (53%) were correctly staged. 339 (25%) patients were under staged, 288 (22%) were over staged. In the under staged group 208 patients had a higher pN stage, of which 92 patients had unforeseen N2 disease (6.9%). In the over staged group 106 patients had a cN that was higher than the pN (8%).

**Conclusion:**

Adequacy of staging non-small cell lung cancer in the Netherlands is very low. Even in the era of Positron Emission Tomography scans half of patients have an unexpected pathological stage. Especially nodal staging remains very challenging and can have implications for the treatment offered to a patient. Solving these problems will improve non-small cell lung cancer care.

**Disclosure:** No significant relationships.



F-046

## DOES THE DEGREE OF PLEURAL INVASION INFLUENCE SURVIVAL IN COMPLETELY RESECTED NON-SMALL CELL LUNG CANCER? CHECKING THE VALIDATION OF T DESCRIPTOR IN THE TNM STAGING

Hiroyuki Ito<sup>1</sup>, H. Nakayama<sup>1</sup>, S. Watanabe<sup>2</sup>, H. Sakurai<sup>2</sup>, K. Suzuki<sup>3</sup>, S. Oh<sup>3</sup>, Y. Ode<sup>4</sup>, S. Takahashi<sup>4</sup>, H. Asamura<sup>5</sup>

<sup>1</sup>*Thoracic Surgery, Kanagawa Cancer Center, Yokohama, Japan*

<sup>2</sup>*Thoracic Surgery, National Cancer Center Hospital, Tokyo, Japan*

<sup>3</sup>*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

<sup>4</sup>*Thoracic Surgery, Shizuoka Cancer Center, Sunto-gun, Shizuoka, Japan*

<sup>5</sup>*Thoracic Surgery, Keio University, Tokyo, Japan*

### Objectives:

Pleural invasion (PL) may have survival influence in completely resected non-small cell lung cancer (NSCLC); it was reflected in the T descriptor of the latest TNM staging system. The aim of this study was to validate the influence of the extent of PL to overall survival (OS) by using the large multicenter database of National Cancer Center Consortium in Japan.

### Methods:

We retrospectively studied the clinicopathological features and OS of NSCLC 2566 patients who received completely anatomical resection; at least segmentectomy with lymph-node dissection from 2009 to 2011, especially in terms of PL.

### Results:

Median follow up time was 39.9 months and OS rate at 5 years was 80.6%. On multivariate analysis, variables which significantly influenced OS were gender, age, clinical and pathological stage, histology, lymphatic vessel invasion, vascular vessel invasion and pleural invasion. In 2000 cases without lymph-node metastasis, PL was still an independent factor for OS and hazard ratio (HR) of PL presence was 3.442 (95% confidence interval 2.571-4.607). PL0 was found in 1541 cases, PL1 264, PL2 78 and PL3 117. HR of PL1 versus PL0 was 4.208 (3.175-5.579), PL2 was 2.662 (2.276-3.114), PL3 was 1.920 (1.733-2.127). PL2 versus PL1 was 2.408 (1.646-3.523), PL3 was 1.557 (1.291-1.878). PL3 versus PL2 was 2.010 (1.153-3.506); they showed significant differences respectively. OS rate at 5 years of each PL status was the following; PL0 92.5%, PL1 78.2%, PL2 71.4% and PL3 64.4%. But in the PL3, cases classified as T2a which mean interlobar invasion did not show superior survival rate than larger T status cases (52.2% versus 66.6%,  $p=0.689$ ).

### Conclusion:

PL was an independent prognostic factor, and the validation of T descriptor of TNM staging system was mostly confirmed. But PL3 of interlobar invasion did not show good survival rate, thus further evaluation of interlobar invasion will be needed for upcoming TNM staging revision.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****15:30 - 17:30****BIOLOGY CLUB****F-047****ANALYSIS OF MICRORNA EXPRESSION IN MALIGNANT PLEURAL MESOTHELIOMA, ASBESTOSIS AND BENIGN PULMONARY DISEASE: A PRELIMINARY STUDY**

Luca Ampollini<sup>1</sup>, P. Mozzoni<sup>2</sup>, L. Gnetti<sup>3</sup>, M. Tiseo<sup>4</sup>, L. Rolli<sup>1</sup>, M. Solinas<sup>1</sup>, L. Ventura<sup>1</sup>, E.M. Silini<sup>3</sup>, P. Carbognani<sup>1</sup>, M. Rusca<sup>1</sup>, M. Goldoni<sup>5</sup>, M. Corradi<sup>5</sup>, A. Mutti<sup>5</sup>

<sup>1</sup>*Department of Surgical Sciences, Thoracic Surgery, University Hospital of Parma, Parma, Italy*

<sup>2</sup>*University of Parma, Italian Workers' Compensation Authority (INAIL) Research Center, Parma, Italy*

<sup>3</sup>*Diagnostic Department, Pathological Anatomy and Histology, Parma, Italy*

<sup>4</sup>*Department of Emergency and General Medicine, Medical Oncology, Parma, Italy*

<sup>5</sup>*Department of Clinical and Experimental Medicine, University of Parma, Parma, Italy*

**Objectives:**

to evaluate the diagnostic potential of a panel of microRNAs in plasma samples of patients with malignant pleural mesothelioma (MPM).

**Methods:**

a group of patients with pathological diagnosis of MPM were randomly selected from a prospective mesothelioma database. Similarly, a group of patients with asbestosis and one with benign pulmonary disease were chosen for comparison. A panel of miRNA including miR-16, miR-17, miR-21, miR-126 and miR-486 were evaluated. Analysis of covariance (ANCOVA) followed by Bonferroni post-hoc test, was used for multiple comparisons. P<0.05 was considered significant.

**Results:**

14 patients with malignant pleural mesothelioma, 14 patients with asbestosis and 21 patients with benign pulmonary disease were studied. The expression of miR-16 (p<0.0001), miR-17 (p<0.0001), miR-21 (p=0.004), miR-126 (p=0.0016) and miR-486 (p=0.003) was significantly lower in patients with asbestosis compared with subjects with benign pulmonary disease. The expression of miR-16 (p=0.018), miR-17 (p=0.024) and miR-126 (p=0.019) was significantly lower in patients with MPM compared with patients with benign pulmonary disease. Only miR-486 was able to discriminate patients with MPM in respect to patients with asbestosis (p=0.004). Considering patients with MPM, miR-17 (p=0.023) and miR-486 (p=0.015) were significantly more expressed in patients with epithelioid type than in patients with sarcomatoid and biphasic type.



**Conclusion:**

the expression of miR-16, miR-17 and miR-126 was able to distinguish patients with MPM compared with subjects with benign pulmonary diseases. miR-17 and miR-486 were significantly higher in patients with mesothelioma epithelioid type. The available data clearly support the role of miRNAs in the aetiology of MPM, suggesting their possible use as diagnostic markers of disease. Further large-scale studies are required to validate their usefulness in routine clinical settings.

**Disclosure:** No significant relationships.

F-048

**PROGNOSTIC IMPACT OF TUMOR-INFILTRATING CCR4+ LYMPHOCYTES IN PATHOLOGICAL T1 N0-2 M0 LUNG ADENOCARCINOMA**

Guang-Liang Qiang<sup>1</sup>, M. Anraku<sup>2</sup>, A. Ushiku<sup>3</sup>, E. Sato<sup>4</sup>, K. Nagayama<sup>2</sup>, J. Nitadori<sup>2</sup>, T. Murakawa<sup>2</sup>, K. Kakimi<sup>5</sup>, M. Fukayama<sup>3</sup>, J. Nakajima<sup>2</sup>

<sup>1</sup>*Thoracic Surgery, China-Japan Friendship Hospital, Beijing, China*

<sup>2</sup>*Department of Thoracic Surgery, Graduate School of Medicine, the University of Tokyo, Bunkyo-ku, Tokyo, Japan*

<sup>3</sup>*Pathology, Graduate School of Medicine, The University of Tokyo, Bunkyo-ku, Tokyo, Japan*

<sup>4</sup>*Pathology, Tokyo Medical University, Tokyo, Japan*

<sup>5</sup>*Immunotherapeutics, Graduate School of Medicine, The University of Tokyo, Bunkyo-ku, Tokyo, Japan*

**Objectives:**

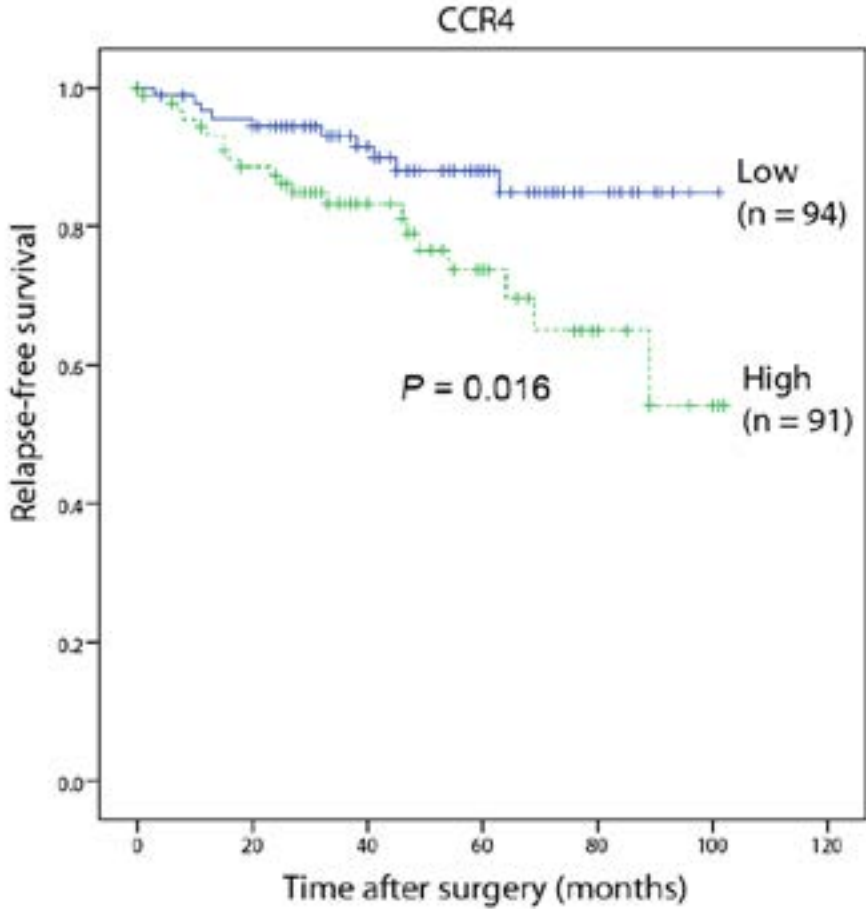
CC chemokine receptor type 4 (CCR4) was found to be a prognostic marker in various tumors. However, the role of CCR4 in lung cancer had not been well revealed. In this study, we investigated the expression of CCR4 in tumor-infiltrating lymphocytes (TILs) of lung adenocarcinoma and correlated it with clinicopathological characteristics and prognosis.

**Methods:**

The expression of CCR4, CD8, CD25, and Foxp3 in TILs was quantified by tissue microarray and immunohistochemistry in 185 completely resected pathological T<sub>1</sub> N<sub>0-2</sub> M<sub>0</sub> lung adenocarcinomas. All slides were digitalized with a digital slide scanner, and immunohistochemical results were quantitatively analyzed with an image analyzing program. The relationship between the expression of CCR4, CD8, and Foxp3 in TILs with clinicopathological characteristics and long-term survival were analyzed.

**Results:**

The expression of CCR4 was located in the nucleus of lymphocytes, correlated with T stage ( $P=0.016$ ), nodal involvement ( $P=0.017$ ), lymphovascular invasion ( $P=0.005$ ), and relapse ( $P=0.044$ ), but not with age ( $P=0.561$ ), gender ( $P=0.197$ ) or smoking history ( $P=0.161$ ). The 5-year overall survival rate of CCR4 high expression group was 86.7%, lower than that of CCR4 low expression group (91.7%) with statistically significant difference ( $P=0.023$ ); the 5-year relapse-free survival rate of CCR4 high expression group was 73.7%, lower than that of CCR4 low expression group (88.1%) with statistically significant difference ( $P=0.016$ ). In addition, Kaplan-Meier curve for overall survival indicated that CD8, CD25, and Foxp3 expression of TILs were not statistically associated with prognosis ( $P=0.181$ ,  $P=0.293$ , and  $P=0.851$ , respectively).



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**Conclusion:**

The expression of CCR4 in TILs significantly increased with the aggressiveness of lung adenocarcinoma and lymph node metastasis, indicating it may be a predictor of prognosis and potential therapeutic target in patients with lung adenocarcinoma.

**Disclosure:** No significant relationships.

F-049

**PROGNOSTIC IMPLICATION OF AQUAPORINS 1 EXPRESSION IN LUNG ADENOCARCINOMA**

Jacopo Vannucci<sup>1</sup>, L. Cagini<sup>1</sup>, M. Andolfi<sup>1</sup>, G. Bellezza<sup>2</sup>, F. Bianconi<sup>3</sup>, I. Ferri<sup>2</sup>, V. Ludovini<sup>4</sup>, R. Potenza<sup>1</sup>, A.M. Siggillino<sup>4</sup>, F. Puma<sup>1</sup>

<sup>1</sup>*Surgical Science, Thoracic Surgery Unit, University of Perugia, Perugia, Italy*

<sup>2</sup>*Medicine, Institute of Pathological Anatomy and Histology, Division of Cancer Research, Perugia, Italy*

<sup>3</sup>*Department of Electronic and Information Engineering, Perugia University, Perugia, Italy*

<sup>4</sup>*Department of Medical Oncology, Perugia, Italy*

**Objectives:**

Aquaporins (AQPs) are a group of transmembrane water-selective channel proteins playing a major role in regulation of water permeability of plasma membranes. AQPs have been identified as pro-tumorigenic and anti-apoptotic factors promoting tumor progression, invasion and metastasis. The recent reports of AQP1 overexpression in lung adenocarcinoma (AC), strongly suggests their involvement in molecular mechanisms of lung cancer. The aim of this retrospective cohort single centre study was to evaluate the expression and the prognostic significance of AQP1 in resected ACs.

**Methods:**

Patients submitted to pulmonary resection with systematic lymphadenectomy for AC were included. AQP1 expression was analyzed in the resected specimen by immunohistochemistry considering high expression immunoreactivity score (IRS)  $\geq 3$ . Clinical data, pathological TNM staging and follow-up were recorded. Multivariate Cox survival analysis and Fisher T-test were performed.

**Results:**

187 patients, median age 65 years, 71% male, median survival time 44 months, were submitted to lobectomies 69%, wedge resections 15%, bilobectomies 5%, anatomical segmentectomies 8% and pneumonectomies 2%. 114 patients were stage I, 27 stage II and 46 stage III. AQP1 overexpression was detected in 78 AC (41%), without significant differences due to stage of disease, grading or gender. The AQP1 protein overexpression group showed a shorter disease free survival ( $p=0,001$ ), HR 4.714663 [95% CI 1.932511 11.50216], confirmed in multivariate analysis adjusted by stage, grade, sex and age ( $p<0.0001$ , fig 1). Statistically significant difference in overall survival was not observed.

**Conclusion:**

Our results confirm the involvement of AQP1 in ACs. Immunohistochemistry analysis showed that AQP1 expression was irrespective of confounders and there was a significant correlation between AQP1 overexpression and worse DFS.

**Disclosure:** No significant relationships.



F-050

**EXPERIMENTAL EX-VIVO LUNG PERFUSION WITH SEVOFLURANE: EFFECT ON DAMAGED DONOR LUNG GRAFTS**

Xingyu Wang<sup>1</sup>, C. Francioli<sup>1</sup>, R. Parapanov<sup>1</sup>, C. Marcucci<sup>2</sup>, C. Kern<sup>2</sup>, J.Y. Perentes<sup>1</sup>, L. Piquilloud<sup>3</sup>, H. Ris<sup>1</sup>, L. Liaudet<sup>3</sup>, T. Krueger<sup>1</sup>, F. Gronchi<sup>2</sup>

<sup>1</sup>*Thoracic and Vascular Surgery, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>2</sup>*Anesthesiology, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>3</sup>*Intensive Care Medicine, University Hospital of Lausanne, Lausanne, Switzerland*

**Objectives:**

Ischemia-reperfusion injury is a key mechanism of graft damage during lung transplantation, which could be targeted by therapies applied during ex-vivo lung perfusion (EVLP). The inhalational anaesthetic sevoflurane was found to protect to some degree against ischemia-reperfusion injury when used for ventilation. In this experimental study we aimed to determine the therapeutic potential of volatile Sevoflurane added to the perfusate during EVLP of damaged lung grafts donated after circulatory death (DCD).

**Methods:**

Two groups of 6 Sprague-Dawley rats each were used. After cardiac arrest and a warm ischemic time of 1 hour the lungs were flushed with cold Perfadex<sup>®</sup>, harvested and kept for 2 hours at 4°C. Normothermic EVLP during 3 hours was performed using a customized circuit primed either with Steen solution<sup>®</sup> only (control group) or supplemented within the first 30 minutes of EVLP with a gas mixture containing 2% of sevoflurane (treatment group). Differential oxygen partial pressures in the perfusate (DppO<sub>2</sub>), vascular resistance (PVR), lung compliance (LC), peak airway pressure (PAWP) and lung weight gain (WG) were measured. At the end of EVLP, protein and lactate dehydrogenase (LDH) levels were determined in bronchoalveolar lavage (BAL) and cytokine-induced neutrophil chemoattractant factor 1 (CINC-1), tumor necrosis factor alpha (TNF- $\alpha$ ), interleukin-6 (IL-6) and protein carbonyl (index of oxidative stress) were determined in lung tissue.

**Results:**

Damaged lungs treated with sevoflurane during EVLP displayed significantly improved LC, reduced weight gain, lower TNF- $\alpha$ , LDH and protein carbonyl levels as compared to controls. PAWP, protein in BAL and IL-6 were diminished in treated lungs, but were not statistically different to controls. DppO<sub>2</sub>, PVR were found comparable in both groups.

**Conclusion:**

Intravascular administration of volatile sevoflurane during EVLP reduces inflammatory response and oxidative stress and improves the functional status of damaged rat DCD lungs.

**Disclosure:** No significant relationships.

F-051

**EUKARYOTIC TRANSLATION INITIATION FACTOR 3B ACCELERATES THE PROGRESSION OF ESOPHAGEAL SQUAMOUS CELL CARCINOMA**Fengkai Xu<sup>1</sup>, C. Lu<sup>1</sup>, X. Liu<sup>2</sup>, J. Gu<sup>1</sup>, Y. Yuan<sup>1</sup>, G. Zhao<sup>1</sup>, R. Liu<sup>2</sup>, X. Yu<sup>3</sup>, Y. Chu<sup>2</sup>, D. Ge<sup>1</sup><sup>1</sup>Thoracic Surgery, The Affiliated Zhongshan Hospital of Fudan University, Shanghai, China<sup>2</sup>Immunology, Key Laboratory of Medical Molecular Virology of MOE/MOH, School of Basic Medical Sciences, Fudan University, Shanghai, China<sup>3</sup>Nephrology, The Affiliated Zhongshan Hospital of Fudan University, Shanghai, China**Objectives:**

Eukaryotic translation initiation factor 3b (EIF3b) is one of the subunits of EIF3 and up-regulated in several cancers. However, its biological and clinical roles in esophageal squamous cell carcinoma (ESCC) remain unclear. This study aims to explore the role of EIF3b in the progression and prognosis of ESCC.

**Methods:**

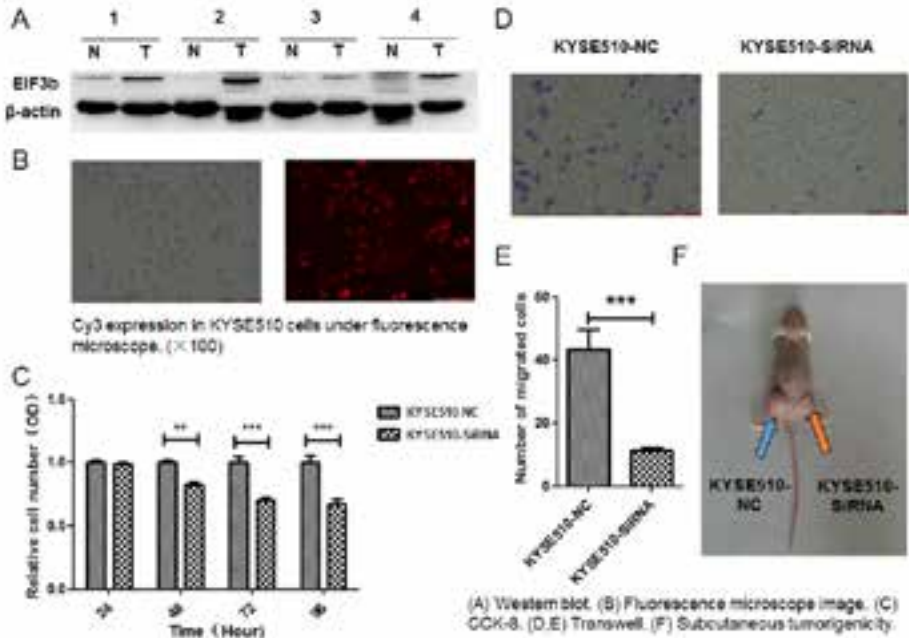
We detected the EIF3b expression in esophageal cancer and paracaecer tissues through immunohistochemistry and Western blot. The EIF3b expression in ESCC cell lines, KYSE510 and EC109, was knocked down through SiRNA. The efficiency and effect of the transfection were assessed through the observation of Cy3 expression by fluorescence microscope and EIF-3b expression by Western blot, respectively. The influence of the knock-down was evaluated by CCK-8, Transwell, wound-healing, cell apoptosis assays *in vitro* and subcutaneous tumorigenic assay *in vivo*. DFS and OS curves were drawn by the Kaplan-Meier product limit method. The effects of several risk factors on DFS and OS were analyzed by Cox proportional-hazards regression.

**Results:**

The expression of EIF3b was higher in ESCC tissues than that of the paracancer ones. *In vitro*, compared with the negative control, the knock-down of EIF3b inhibited cell proliferation and invasion, and accelerate cell apoptosis ( $p < 0.001$ ). *In vivo*, the subcutaneous tumors formed with EIF3b-SiRNA cells grew significantly slower than the ones formed with EIF3b-NC cells. Clinically, the postoperative disease free survival (DFS) and overall survival (OS) in patients with high EIF3b expression was significantly shorter than those in patients with low EIF3b expression (DFS: 48.00% vs 65.82%,  $p=0.015$ ; OS: 45.33% vs 63.29%,  $p=0.016$ ).



Figure 1. Part figures of experimental results.



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Univariate analysis of patients' survival

		DFS				
EIF3b expression	events/patients	Median DFS(mo)	<i>P</i>	events/patients	Median DFS(mo)	<i>P</i>
Low	36/75	NR	<b>0.015</b>	34/75	NR	<b>0.016</b>
High	52/79	24		50/79	30	

DFS, disease-free survival; OS, overall survival; NR, not reached.

**Conclusion:**

EIF3b expression contributes to the progression of ESCC and serves as a prognostic marker, which might become a novel therapeutic target.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****17:00 - 19:00****VATS/RATS SESSION****F-052****COMPARISON OF ONCOLOGIC OUTCOMES FOR PATHOLOGIC N1 OR N2 NON-SMALL CELL LUNG CANCER BY VIDEO-ASSISTED THORACIC SURGERY VERSUS THORACOTOMY**YooHwa Hwang, C.H. Kang, S. Park, J.S. Bok, J. Choi, I.K. Park, Y.T. Kim*Department of Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea***Objectives:**

The safety and feasibility of systemic mediastinal LN dissection by thoracoscopic lobectomy remain controversial, especially concerning the problem whether conversion from VATS to thoracotomy is necessary in postoperatively lymph node metastasis. The aim of this study was to compare oncologic outcomes including overall and disease free survival between thoracoscopic and thoracotomy lobectomy for the patients with pathologic N1 or N2 NSCLC.

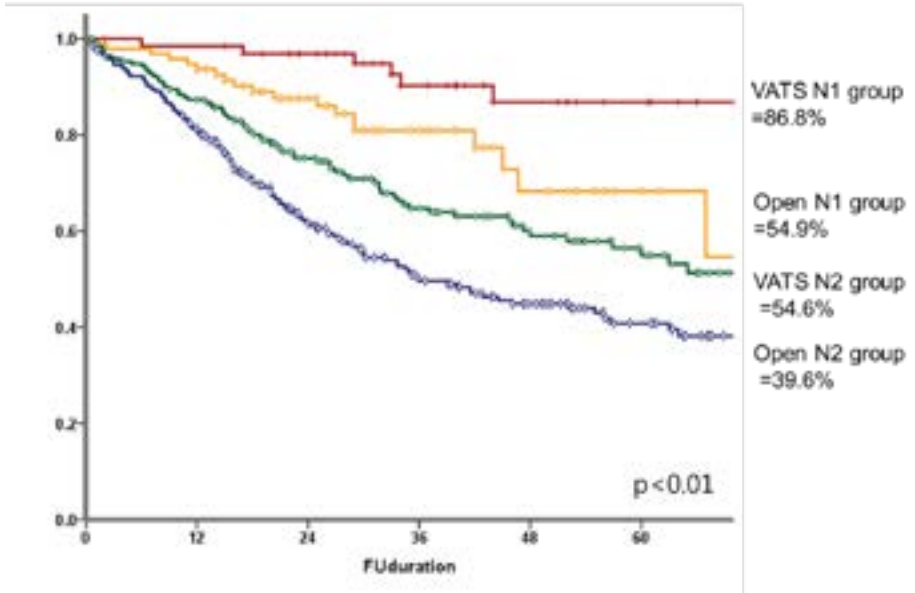
**Methods:**

We conducted a retrospective review of all patients who had a lobectomy for NSCLC in clinical and pathologic databases at our institute from Jan 2000 to Dec 2013. 945 patients underwent curative anatomical resection and systemic mediastinal lymph node dissection for N1 or N2 NSCLC by thoracoscopic surgery (total 160, N1=65, N2=95) or thoracotomy (total 785 N1=344, N2=441). Postoperative outcomes, disease-free survival and overall survival were compared between two groups.

**Results:**

Although thoracoscopic resection were performed in the patients with smaller sized tumor ( $3.1 \pm 1.6$  cm vs  $3.8 \pm 1.8$ cm,  $p < 0.01$ ), more than 60% of patients in VATS Group had pathologic T2 or 3 with pleural invasion. Operative mortality and postoperative complications were not significantly different between two groups. Total number of LN was  $32.61 \pm 14.2$  in open group versus  $26.86 \pm 10.1$  in VATS group ( $p < 0.01$ ). The rate of nodal metastasis (number of metastatic nodes/number of dissected nodes) was similar between the two groups. ( $p = 0.78$ ). Median follow-up was 72months. Both the incidence and distribution of recurrence were similar. The 5-year overall survival was significantly higher in the thoracoscopic groups. (86.8% vs 54.6% in pN1 NSCLC, 54.6 % vs 39.5% in pN2 NSCLC,  $p < 0.01$ ) (Figure 1).

### 5 – Year Overall Survival



Monday P.M.  
Abstracts 010 - 070

**Conclusion:**

Thoracoscopic lobectomy could be an acceptable and valuable approach in pathologic N1-N2 NSCLC, providing the safety and feasibility of systemic mediastinal LN dissection despite the presence of lymph node metastasis.

**Disclosure:** No significant relationships.

F-053

**COMPARISON OF ROBOTIC WITH VIDEO-ASSISTED THORACOSCOPIC LUNG RESECTION: LEARNING, OUTCOMES AND MORBIDITY**

G. Veronesi<sup>1</sup>, P. Solli<sup>2</sup>, P. Maisonneuve<sup>3</sup>, Alessandro Pardolesi<sup>1</sup>, P. Novellis<sup>1</sup>, N. Filippi<sup>1</sup>, D. Proverbio<sup>1</sup>, R. Bertolotti<sup>1</sup>, L. Spaggiari<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy*

<sup>2</sup>*Department of Thoracic Surgery, Papworth Hospital NHS Foundation Trust Cambridge, Cambridge, United Kingdom*

<sup>3</sup>*Division of Epidemiology and Biostatistics, European Institute of Oncology, Milan, Italy*

**Objectives:**

Robotic lung resection is gaining popularity despite limited published evidence. Comparative studies are needed to provide data on the safety and effectiveness of robotic resection. We compared our experience of robot-assisted resection with that of video-assisted thoracoscopic surgery (VATS) evaluating learning and early surgical outcomes.

**Methods:**

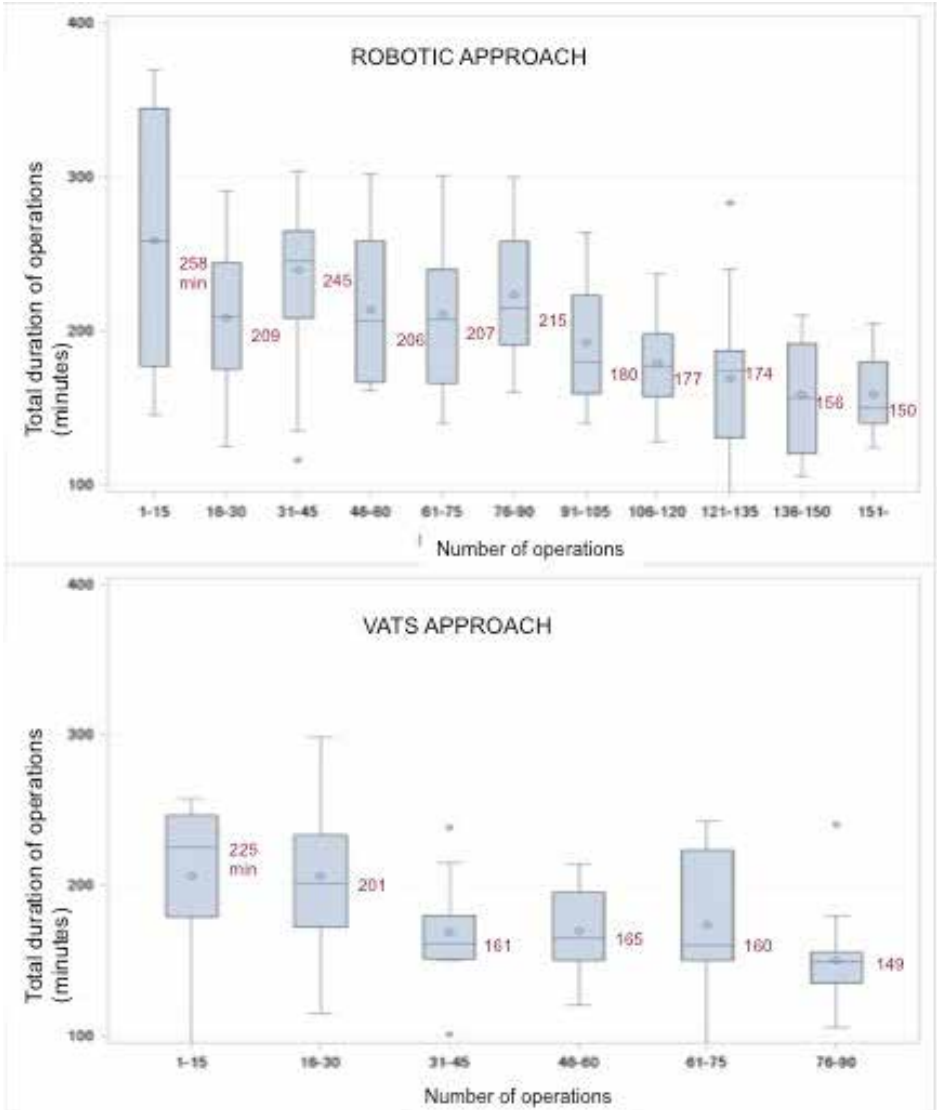
We retrospectively reviewed (prospectively maintained database) consecutive patients undergoing robotic surgery or VATS, from 2007 through 2013, for anatomic lung resections (lobectomies or segmentectomies) for primary lung cancer performed by GV for RAR, and PGS for VATS, both with comparable experience in open surgery. We identified 257 cases: 172 robotic and 85 VATS.

**Results:**

Median operating time for robotic surgery showed a two-phase improvement: a decrease after the first 15 cases (from 258 to 209 minutes) and a subsequent decrease to 180-150 minutes after 90 operations (Figure). For VATS, operating time reduced after the first 30 cases (Figure). For the first 30 robotic operations compared to first 30 VATS, conversion rate was lower (13% vs. 30%,  $p=0.21$ ); morbidity was higher (33% vs. 6.7%  $p=0.23$ ); surgery duration (median 217 min vs. 214 min;  $p=0.28$ ; mean 233 min vs. 206 min;  $p=0.09$ ) and duration of postoperative stay were similar (median 6 days;  $p=0.96$ ). Considering all interventions (172 RAR + 85 VATS), in robotic group compared to VATS more patients received radical lymph node dissection were lower (97.7% versus 88.2%,  $p=0.003$ ), and surgery duration was longer (median 190 min versus 172 min;  $p=0.04$ ).

**Conclusion:**

The robotic learning phase was associated with lower conversion rate and more frequent radical lymph node dissection than VATS, with similar operating time and worse morbidity (higher complication rate). Further studies focusing on quality of life and postoperative pain are required to better define the benefits of the robotic approach to anatomic resection for early-stage lung cancer.



**Disclosure:** No significant relationships.

## F-054

**THORACOSCOPIC ANATOMICAL SEGMENTECTOMY VERSUS OPEN SEGMENTECTOMY. A CASE MATCHED ANALYSIS AT A SINGLE CENTER**

Majed Refai<sup>1</sup>, M. Salati<sup>1</sup>, C. Pompili<sup>2</sup>, F. Xiumè<sup>1</sup>, R. Bucchianeri<sup>1</sup>, A. Brunelli<sup>2</sup>, A. Sabbatini<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy*

<sup>2</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

Pulmonary segmentectomy is indicated in some selected patients yet few studies explored thoracoscopic segmentectomy advantages. This study compares thoracoscopic segmentectomy (TS) with open segmentectomy (OS).

**Methods:**

This is an observational study performed on a prospective quality –controlled, electronic data base at a single center from 2000 till 2014. 122 anatomical segmentectomies; 100 OS and 22 TS. Propensity score case matching was performed to select samples of patients for balanced comparative analysis according to baseline characteristics. Within the two matched groups of patients (22 OS and 22 TS) operative and postoperative outcomes were compared.

**Results:**

22 well matched pairs of patients, undergoing OS and TS were compared. Table 1 shows the comparison between the two groups. We had similar operative time in both groups. Pleural effusion was significantly lower in the TS group (370ml vs 589ml p:0.006). Moreover incidence of total complications morbidity was higher in OS group (6vs 2 p:0.08). Chest tube duration was significantly lower in the TS group (6.2vs 2.3 p:0.004). However, hospital length of stay was shorter among the patients undergoing TS (4.4 vs 7 p:0.01).

**Conclusion:**

Video-assisted thoracoscopic segmentectomy is a safe procedure which was associated with better outcomes and reduced hospital stay when compared with an open segmentectomy.

**Table 1**  
Comparison between the matched groups

	<b>OS 22pts</b>	<b>TS 22pts</b>	<b>p-value</b>
<b>Operation time, min</b>	168.6 (45.2)	176.4 (48.1)	0.5
<b>Pleural effusion (1<sup>st</sup>48 hrs) , ml</b>	589,1 (379,2)	370 (162)	0.006
<b>Total complication, n</b>	6 (27%)	2 (9%)	0.08
<b>Air leak, days</b>	1.7 (4.4)	0.2 (0.7)	0.1
<b>Chest tube, days</b>	6.2 (6.6)	2.3 (0.5)	0.004
<b>Hospital stay, days</b>	7 (5)	4.4 (2.6)	0.01

**Disclosure:** No significant relationships.

F-055

**MINIMALLY INVASIVE THYMECTOMY FOR LARGE THYMOMAS IS ASSOCIATED WITH LOW PERIOPERATIVE MORBIDITY AND MORTALITY**Candice Wilshire, D. Shultz, R. Aye, A. Farivar, E. Vallières, B. Louie*Thoracic Surgery, Swedish Medical Center and Cancer Institute, Seattle, United States of America***Objectives:**

The size of thymic masses has generally been accepted as a determinant of operative approach, although no universal guidelines exist. Surgeons agree that lesions  $\leq 3$ cm are amenable to minimally invasive approaches which may otherwise limit visualization and specimen removal. Although removal of larger tumors has been published as case reports, no studies report perioperative outcomes of a patient cohort.

**Methods:**

We retrospectively reviewed patients with encapsulated thymomas  $\geq 3$ cm who underwent a thymectomy at our institution from 2001-2014, including a minimally invasive approach from 2008. Patients with carcinoma, metastases at presentation, or those who underwent induction chemoradiation were excluded. Patients were divided into 2 groups based on the operative approach: group 1 - minimally invasive and group 2 – open. Each was further sub-divided based on tumor size 3-5cm and  $>5$ cm. Complications were graded according to the Ottawa Classification. Results are reported as median and interquartile ranges unless otherwise stated.

**Results:**

A total of 41 patients were evaluated (22 in group 1 and 19 in group 2). The median age was 59 (49-68) and 23 (56%) were male. The tumor size was not significantly different between the groups: group 1 - 6cm (4-6) vs. group 2 – 6cm (5-9),  $p=0.08$ . Only 2 patients (10%) in group 1 encountered major postoperative morbidity and there were no peri-operative mortalities (Table 1). There were no significant changes in pathologic stage or overall complications and mortality. Post-operative narcotic analgesia and overall length of stay was significantly reduced in group 1.



Table 1. Perioperative outcomes of patients undergoing thymectomy					
	Group 1 (N=22)		Group 2 (N=19)		P Value G1 vs. 2
	3-5 cm (N=11)	>5 cm (N=11)	3-5 cm (N=4)	>5 cm (N=15)	
Median ASA score (IQR)	2 (2-3)	2 (2-3)	2 (1-2)	2	0.236
Median operative time, minutes (IQR)	210 (170-225)	175 (112-216)	183 (178-187)	156 (141-186)	0.927
Pathologic Masaoka					0.741
Stage I (%)	6 (55)	5 (45)	2 (50)	5 (33)	
Stage II (%)	5 (45)	5 (45)	1 (25)	8 (53)	
Stage III (%)	0	1 (9)	1 (25)	2 (13)	
Complications					0.641
Minor, grade I-II (%)	4 (36)	0	0	2 (13)	
Major, grade III-V (%)	2 (18)	0	1 (25)	4 (27)	
Median ICU days (IQR)	0 (0-1)	0 (0-1)	1	3 (3-5)	<b>0.016</b>
Return to OR (%)	1 (9)	0	0	1 (7)	0.535
Median days epidural/PCA (IQR)	1 (1-2)	1	1	3 (1-3)	<b>0.021</b>
Median CT duration (IQR)	2	1 (1-2)	3 (2-3)	3 (3-5)	0.337
Median hospital stay (IQR)	3 (2-3)	2 (1-3)	5 (4-9)	5 (4-8)	<b>0.011</b>
Perioperative mortality	0	0	0	0	
Median follow-up, months (IQR)	17 (9-29)		80 (40-92)		
Recurrent disease	0	0	0	0	

### Conclusion:

In thymomas larger than 3cm, a minimally invasive thymectomy is feasible and is associated with lower morbidity in addition to a lower requirement for post-operative narcotic analgesia and decreased ICU and shorter hospital stay. A prolonged postoperative surveillance is required to determine the oncologic efficacy of this resection approach.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****17:30 - 19:00****SESSION VI: INNOVATIVE/EXPERIMENTAL****F-056****HAS THE QUALITY OF REPORTING OF RANDOMIZED CONTROLLED TRIALS IN THORACIC SURGERY IMPROVED?**

Janet Edwards, N. Dharampal, W. Chung, M. Brar, R. Servatyari, C.G. Ball, J. Seto, S. Grondin  
*Surgery, University of Calgary, Calgary, Canada*

**Objectives:**

To evaluate the quality of reporting of randomized controlled trials (RCTs) in the thoracic surgery literature according to Consolidated Standards for Reporting of Trials (CONSORT) and to determine predictors of quality.

**Methods:**

All RCTs published in four principle journals between 1998-2013 were identified in PubMed. Two independent reviewers assessed each trial using the CONSORT checklist (1996 Edition) with discrepancies resolved by a third reviewer. Mean checklist score was compared between trials published from 1998-2005 and 2006-2013. The kappa statistic for inter-rater agreement was calculated. Mean scores from the two periods were compared using the Students' test with 95% confidence intervals. Univariable linear regression was then performed to identify predictors of quality (time period, number of authors, journal, geographic region, multi versus single center, anatomic area of thoracic surgery, and industry sponsorship).

**Results:**

After two rounds of review, 203 of the 2838 identified articles met inclusion criteria. The overall kappa coefficient was 0.95 indicating very good agreement between reviewers. The mean CONSORT score was significantly higher in 2006-2013 (mean 10.8; 95%CI: 10.3-11.2) than 1998-2005 (mean 9.3; 95%CI: 8.7-9.6). **Table 1** shows that there was strong evidence that mean CONSORT score increased with increased number of authors and industry sponsorship, and varied significantly according to journal and geographic region. Mean score was not influenced by area of thoracic surgery, although there was a trend toward higher scores in the transplant literature. The mean score was 2.01 points lower in single centred trials compared to multicentered trials (95%CI: -2.88 to -1.15).

**Table 1.** Univariate linear regression assessing predictors of increased quality of reporting according to CONSORT score.

Characteristic	Change in Mean CONSORT Score	95% Confidence Interval	P Value
<b>Number of Authors</b>			
Increase by one	0.09	0.052-0.13	<0.0001
<b>Journal*</b>			
Ann Thorac Surg	Baseline	-	
Eur J Cardiothorac Surg	0.12	- 0.76 to 1.01	<0.0001
J Thorac Cardiovasc Surg	0.56	- 0.53 to 1.65	
N Engl J Med	2.99	1.85 to 4.13	
<b>Geographic Area</b>			
Asia	Baseline	-	
Europe	1.16	0.17 to 2.14	<0.0025
North America	1.90	0.79 to 3.01	
Other	2.21	0.79 to 3.63	
<b>Anatomic Area of Thoracic Surgery</b>			
Mediastinum	Baseline	-	
Chest Wall	1.50	- 4.06 to 7.06	0.17
Pleura	2.0	- 5.76 to 9.76	
Lung	2.35	- 3.17 to 7.86	
Trachea	2.50	- 4.22 to 9.22	
Esophagus	2.81	- 2.81 to 8.43	
Transplant	8.0	0.24 to 15.76	
<b>Industry Sponsorship</b>			
No	0.65	- 0.39 to 1.68	0.0002
Yes	2.31	1.22 to 3.40	

\* Ann Thorac Surg = Annals of Thoracic Surgery; Eur J Cardiothorac Surg = European Journal of Cardiothoracic Surgery; J Thorac Cardiovasc Surg = Journal of Thoracic and Cardiovascular Surgery; N Engl J Med = New England Journal of Medicine

**Conclusion:**

Our study suggests that the quality of reporting in the thoracic surgery literature is improving with time and is predicted by factors including composition and geographic origin of the research group, industry sponsorship and journal of publication. Efforts should be made to improve quality of reporting in thoracic surgery.

**Disclosure:** No significant relationships.

F-057

**PYRROLIDINE DITHIOCARBAMATE ADMINISTERED DURING EXPERIMENTAL EX-VIVO LUNG PERFUSION ALLEVIATES LUNG DAMAGE AFTER EXTENDED WARM ISCHEMIC TIMES**

Cyril Francioli<sup>1</sup>, X. Wang<sup>1</sup>, R. Parapanov<sup>1</sup>, F. Gronchi<sup>2</sup>, J.Y. Perentes<sup>1</sup>, L. Piquilloud<sup>3</sup>, M. Gonzalez<sup>1</sup>, L. Liaudet<sup>3</sup>, T. Krueger<sup>1</sup>

<sup>1</sup>*Thoracic and Vascular Surgery, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>2</sup>*Anesthesiology, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>3</sup>*Intensive Care Medicine, University Hospital of Lausanne, Lausanne, Switzerland*

**Objectives:**

The use of ex-vivo lung perfusion (EVLV) is of particular interest in grafts where the risk of unidentified lung damage is high, such as donation after circulatory death (DCD). From withdrawal of life support or cardiac arrest to cold preservation DCD lungs are at risk to undergo hypotension and warm ischemia. In this situation the up-regulation of the Nuclear factor-kappa B (NF-κB), a family of transcription factors, plays a critical role in the inflammatory response. We therefore studied the potential of pyrrolidine dithiocarbamate (PDTC), an inhibitor of NF-κB pathway and antioxidant, to reduce the tissue damage of rat lungs harvested after circulatory death and an extended warm ischemic time.

**Methods:**

Two groups of 6 Sprague-Dawley rats each were used. Following cardiac arrest and 1 hour of warm ischemic preservation the lungs were flushed with cold Perfadex<sup>®</sup>, harvested and kept for 2 hours at 4°C. Normothermic EVLP during 4 hours was performed using a customized circuit primed either with Steen solution<sup>®</sup> only or supplemented with pyrrolidine dithiocarbamate (2.5mg/ml). Differential oxygen partial pressures in the perfusate (DppO<sub>2</sub>), pulmonary artery pressure (PAP), vascular resistance (PVR), lung compliance (LC), peak airway pressure (PAWP) and lung weight gain (WG) were measured. At the end of EVLP, protein content, lactate dehydrogenase (LDH), protein carbonyl, tumor necrosis factor 1 (TNF-1), cytokine-induced neutrophil chemoattractant 1 (CINC-1) and interleukin-6 (IL-6) levels were determined in bronchoalveolar lavage (BAL).

**Results:**

4 hours of EVLP with PDTC resulted in a significantly improvement of LC, PAP, PVR, PAWP, WG, DppO<sub>2</sub> and largely suppressed the increase of protein content, LDH, protein carbonyl, TNF-1, CINC-1 and IL-6 in BAL as compared to the untreated control lungs.

**Conclusion:**

Pharmacological intervention during EVLP aiming to inhibit the NF-κB pathway markedly improves the functional status of DCD lungs procured after prolonged warm ischemic times.

**Disclosure:** No significant relationships.



F-058

**INTRAOPERATIVE MERGED FLUORESCENCE IMAGE-GUIDED PULMONARY SEGMENTECTOMY**Hyun Koo Kim<sup>1</sup>, Y. Oh<sup>2</sup>, Y.H. Quan<sup>1</sup>, B. Kim<sup>2</sup>, K.N. Han<sup>1</sup>, Y.H. Choi<sup>1</sup><sup>1</sup>*Thoracic and Cardiovascular Surgery, Korea University College of Medicine, Korea University Guro Hospital, Seoul, Korea*<sup>2</sup>*Bio-convergence Engineering, Korea University, Seoul, Korea***Objectives:**

Intraoperative color and fluorescence merged imaging system (ICFIS) is a new technique that can potentially aid the demarcation of intersegmental borders during pulmonary segmentectomy. However, the optimal dosage of fluorescent dye to allow safe, sustained imaging during segmentectomy has not been determined.

**Methods:**

In the first phase of the study, 9 rabbits were subject to pulmonary segmentectomy. These were divided into 3 groups of 3 rabbits each that received intravenously injected indocyanine green (ICG) at concentrations of 3.0, 0.6, or 0.3 mg/kg respectively after ligating the dominant segmental pulmonary artery to the targeted segment. In the second phase, the optimal dose suggested from the first phase was used for ICFIS guidance during pulmonary segmentectomy in 5 pigs.

**Results:**

In the first phase of the study, ICG concentrations of 3.0, 0.6, and 0.3 mg/kg yielded mean fluorescence signal ratios between the targeted segment and normal lung of  $2.11 \pm 0.06$ ,  $2.02 \pm 0.17$ , and  $1.89 \pm 0.25$  respectively. The mean times for washout of ICG from the normal lung were 6, 3, and 1 respectively. From this, the concentration of 0.6 mg/kg was determined to be optimal, and hence was used in the second phase. With this concentration used, the mean washout time was found to be longer in pigs (mean 15 minutes) owing to slower blood circulation time in the large animal model. This provided adequate time for successfully completed ICFIS-guided segmentectomy in all 5 pigs without additional procedures required for demarcating the intersegmental planes (mean duration from ICG injection to completion of segmentectomy was 6 minutes).

**Conclusion:**

ICFIS visualization of intersegmental planes during segmentectomy is potentially feasible, but may be affected by the concentration of fluorescent dye used. Future studies will be required to confirm if an injected ICG concentration of 0.6 mg/kg provides optimal ICFIS results in humans.

**Disclosure:** No significant relationships.

F-059

**SINGLE TWIN-PORT VENO-VENOUS EXTRACORPOREAL LUNG SUPPORT DURING PULMONARY RESECTION IN PATIENTS WITH SEVERELY COMPROMISED PULMONARY FUNCTION**

Bassam Redwan<sup>1</sup>, L. Nique<sup>2</sup>, S. Freermann<sup>1</sup>, M. Semik<sup>1</sup>, S. Ziegeler<sup>2</sup>, N. Dickgreber<sup>3</sup>, S. Fischer<sup>1</sup>

<sup>1</sup>*Thoracic Surgery and Lung Support, Klinikum Ibbenbueren, Ibbenbueren, Germany*

<sup>2</sup>*Anesthesiology and Intensive Care Medicine, Klinikum Ibbenbueren, Ibbenbueren, Germany*

<sup>3</sup>*Thoracic Oncology and Respiratory Medicine, Klinikum Ibbenbueren, Ibbenbueren, Germany*

**Objectives:**

The intraoperative application of extracorporeal lung support (ECLS) during thoracic surgical procedures represents a modern concept with promising results. So far, pumpless extracorporeal interventional lung assist (iLA) and veno-venous or veno-arterial extracorporeal membrane oxygenation (ECMO) via dual cannulation were utilized for complete or partial lung support throughout the surgical procedure. We report the initial intraoperative application of low-flow singular double-lumen v-v-ECMO for ECLS during lung resection in patients with severely impaired preoperative pulmonary function.

**Methods:**

A total of four patients with severely impaired pulmonary function requiring pulmonary resections due to lung carcinoma were included in the current analysis. In all patients, a novel 24 Fr. twin-port double-lumen cannula (NovaPort twin, Novalung, Germany) was inserted percutaneously into the right femoral vein for ECLS. In two patients, pneumonectomy for lung carcinoma was previously performed.

**Results:**

The surgical procedures included two anatomic segmental resections, an extended double-sleeve right lower lobectomy with en-bloc resection of segment 2, as well as one VATS lobectomy of the right upper lobe. In both pneumonectomized patients, ECLS allowed for apnea phases up to 45 minutes. In the remaining two patients with severely impaired pulmonary function, protective low-pressure single lung ventilation was performed uneventfully. All patients were extubated in the operating room. In three patients, ECLS was disconnected at the end of the procedure. In one patient with persisting hypercapnia, ECLS was weaned and removed two hours after extubation. During the postoperative course, one patient developed severe hypercapnic failure. Non-invasive ventilation was not sufficient. Consequently, the patient was intubated and successfully weaned over a temporary dilation tracheostomy from mechanical ventilation.

**Conclusion:**

The use of this novel cannula during thoracic surgical procedures significantly simplifies ECMO-Support for ECLS and contributes to the safe performance of complex surgery in pulmonary compromised patients, thereby minimizing potential complications as seen with other forms of extracorporeal support.

**Disclosure:** No significant relationships.



F-060

**IN-VIVO PRE-VASCULARISED AND RE-CELLULARISED HUMAN ACELLULAR DERMIS IMPROVES EARLY BRONCHIAL ANASTOMOTIC HEALING IN AN IRRADIATED RODENT SLEEVE RESECTION MODEL**

Eric Roessner, F. Doyon, M. Vitacolonna, P. Hohenberger

*Division of Surgical Oncology and Thoracic Surgery, University Medical Centre Mannheim, Mannheim, Germany***Objectives:**

Combined neoadjuvant radiotherapy and parenchyma-preserving sleeve resection for lung cancer remains controversial due to potentially increased rate of anastomotic breakdown. In prior studies we proved that a cuff of human acellular dermis (hAD) seeded *in-vitro* with fibroblasts improved healing of irradiated bronchial anastomosis. We now investigated in a rodent sleeve resection model whether the use of an in-receptient *in-vivo* pre-vascularised and re-cellularized hAD could simplify the clinical routine and omit the need for a GCP-certified cell lab without compromising its value for wound healing.

**Methods:**

72 male Fisher rats underwent a transection and surgical anastomosis of the left main bronchus and were randomized to receive +/- irradiation treatment and +/- augmentation of the anastomosis. We used a dermal transplant that had been subcutaneously implanted in the rats to allow ingrowth of vessels and fibroblasts any by this way pre-vascularise and re-cellularize the graft prior to transferring it to the surgical site. The animals were sacrificed on day 7 and 14 postoperatively. Anastomotic bursting pressure and hydroxyproline concentration were measured as described before.

**Results:**

In the irradiated groups, the anastomotic bursting pressure was significantly higher in the pre-vascularized/ re-cellularized hAD matrix group at day 7 ( $88 \pm 10 \text{ kPa}$  vs.  $151 \pm 12 \text{ kPa}$ ,  $p < 0.0001$ ). Hydroxyproline levels showed a similar pattern in the irradiated group with significant differences at day 7 postop ( $149 \pm 10 \text{ nmol/mg}$  vs.  $207 \pm 11 \text{ nmol/mg}$ ,  $p < 0.0001$ ) but not at day 14 postoperatively.

**Conclusion:**

Augmentation of a bronchial anastomosis by a pre-vascularised and re-cellularized dermal matrix improves early wound breaking strength within the first 7 postop days. The *in-vivo* re-cellularization process simplifies routine clinical use compared to *in-vitro* re-cellularization. Such dermal matrices provide a new and easily usable tool to prevent anastomotic breakdown particularly after preoperative radiation therapy in locally advanced lung cancer.

**Disclosure:** E. Roessner: Research grants: Musculoskeletal Transplant Foundation (NPO), USA  
P. Hohenberger: Research grants: Musculoskeletal Transplant Foundation (NPO), USA

**F-061****CLINICAL EVALUATION OF TOPAZ PORTABLE DIGITALIZED SUCTION SYSTEMS IN THORACIC SURGERY**

Emi Sakai, T. Kohno, S. Fujimori, T. Ikeda, T. Harano, S. Suzuki, T. Iida  
*Respiratory Surgery Department, Toranomon Hospital, Minato-ku, Tokyo, Japan*

**Objectives:**

Thoracic surgical patients have chest drains inserted to quantify air leaks and aid in clinical decision-making regarding the removal of chest drains postoperatively. Thopaz is a portable suction unit which allowed continuous monitoring of the air leak. The aim of this study was to evaluate the safety and efficacy of the chest drain system in thoracic surgery.

**Methods:**

Patients undergoing pulmonary resection were randomised to use with Thopaz or analogue drainage system. The median length of postoperative chest drainage, median hospital length of stay and adverse events were assessed.

**Results:**

Between May 2014 and November 2014, 226 cases (3-ports VATS in 223, thoracotomy in 3) underwent pulmonary resection. Out of 226 cases, 160 cases (thoracotomy in 1) used Thopaz. The characteristics of patients with Thopaz were; 92 men and 68 women, with median age was  $62.7 \pm 15.9$  years old. Type of disease were; 87 primary lung cancer, 33 metastatic pulmonary tumor, 21 pneumothorax, 12 inflammatory disease and 11 other diseases. Type of resection were; 73 lobectomy, 30 segmentectomy and 68 wedge resection. Median hospital length of stay was  $6.0 \pm 3.0$  days. There was no significant difference between Thopaz and analogue drainage system in the median length (days) of drainage (3.39 vs 3.01 in lobectomy, 2.37 vs 3.06 in segmentectomy and 2.08 vs 1.88 in wedge resection). Out of 10 cases in Thopaz group with lung collapse after drain removal, 6 cases received an additional drainage procedure. There was no adverse event in each group.

**Conclusion:**

The use of Thopaz did not demonstrate advantages over the analogue drainage system in this study. So far, it may be necessary to get used to use this device to obtain some tips in using Thopaz. Further study seems to be necessary.

**Disclosure:** No significant relationships.





F-062

**NEW THERAPEUTIC APPROACH FOR LUNG CANCER**Yoshinori Sakata<sup>1</sup>, Y. Ino<sup>2</sup>, T. Todo<sup>2</sup>, N. Ikeda<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, Tokyo Medical University, Tokyo, Japan*<sup>2</sup>*Division of Innovative Cancer Therapy, The Institute of Medical Science, The University of Tokyo, Tokyo, Japan***Objectives:**

Lung cancer is the leading cause of death among cancer worldwide, because, presently, there is no effective treatment at recurrence or at advanced stages. The use of oncolytic herpes simplex virus type 1 (HSV-1) has been shown to be an effective therapeutic approach for a variety of cancer in preclinical models. A third generation oncolytic HSV-1, G47Δ, is currently used in multiple clinical trials in Japan with promising results. In this study, we investigated the potential of G47Δ as a new therapeutic modality for human lung cancer.

**Methods:**

Human lung cancer cell lines A549 (adenocarcinoma), EBC-1 (squamous cell carcinoma), LU99 (large cell carcinoma) and SBC-3 (small cell carcinoma) were used. Infectivity and cytopathic effects of G47Δ on lung cancer cell lines were assayed *in vitro*. Viral replication was determined by standard viral plaque assay. For *in vivo* studies, athymic mice harboring established subcutaneous tumors and lung tumors generated with A549 or EBC-1 were used.

**Results:**

All cell lines were susceptible and sensitive to G47Δ irrespective of histological types. Viral replication assay resulted in approximately a 200-fold increase in virus titer by 48 h. In subcutaneous xenograft models, intraneoplastic inoculations with G47Δ significantly inhibited the tumor growth compared with those with mock. In orthotopic xenograft models, intrapleural inoculations with G47Δ prolonged the survival time.

**Conclusion:**

Oncolytic HSV-1 G47Δ was effective in human lung cancer cell lines. Direct intratumoral inoculation of G47Δ induced an obvious therapeutic effect on lung cancer, suggesting G47Δ may be a potent therapeutic modality for all histological types of lung cancer.

**Disclosure:** No significant relationships.

**F-063****IS THERE ANY CORRELATION BETWEEN CDKN2 P16 AND MDM2 VARIANTS AND PROGNOSIS IN LUNG CANCER PATIENTS?**

Akif Turna<sup>1</sup>, E. Hekimoglu<sup>1</sup>, E. Yenilmez<sup>2</sup>, S. Turan<sup>2</sup>, O. Kucukhuseyin<sup>2</sup>, K. Kaynak<sup>1</sup>, I. Yaylim<sup>2</sup>

<sup>1</sup>*Department of Thoracic Surgery, Istanbul University, Cerrahpasa Medical Faculty, Istanbul, Turkey*

<sup>2</sup>*Department of Molecular Medicine, Istanbul University Institute for Experimental Research, Istanbul, Turkey*

**Objectives:**

CDKN2 p16 plays a crucial role in G1/S-transition in cell-cycle. It is known that double minute 2 (MDM2) protein negatively manages p53 expression level in modulating DNA repair, cell-cycle control, cell growth and apoptosis. The aim of this study is to investigate the association between CDKN2 p16 polymorphisms, the risk of lung tumor development and clinicopathologic parameters of operated lung cancer patients.

**Methods:**

Between January 2012 and May 2014, 94 operated pIA-pIIIA non-small cell lung cancer patients and 166 healthy control were included in this study. Seventy-six patients (80.8%) underwent open lobectomy, 4 patients (4.3%) had bilobectomy while 14 (14.9%) had undergone pneumonectomy. The genomic DNA was isolated with salting-out procedure and CDKN2 p16 540 C>G, CDKN2 p16 580 C>T and MDM2 SNP309 T>G polymorphisms was analyzed by PCR based techniques.

**Results:**

The genotypic frequencies of MDM2 SNP309 T>G and CDKN2 p16 540 C>G were significantly different between the study groups ( $p < 0.001$ ;  $p < 0.001$ ). However, the frequency of CDKN2 580 C>T genotype was not statistically significant between the groups. It was found that possessing CDKN2 p16 heterozygote genotype (CG) genotype 1.488 fold increases the risk of non small cell lung cancer development ( $p < 0.001$ ). In addition, possessing MDM2 SNP309 TT genotype increases 1,7 fold the risk from lung tumors in our patients ( $p = 0.006$ ). There were also statistically significant association between N status (N1 and N2) and CDKN2 p16 polymorphism ( $p = 0.02$ ), and perineural invasion ( $p = 0.01$ ). We found that, CDKN2 p16 polymorphism was an independent negative prognosticator in resected operable lung cancer patients (HR: 1.21, 95% confidence interval: 1.14-4.21,  $p = 0.02$ ).

**Conclusion:**

We found that CDKN2 p16 540 C>G and MDM2 SNP309 T>G seem to be an important factor in development of non-small cell lung tumors. It was also found to be associated with mediastinal lymph node involvement, perineural invasion and survival in resected lung cancer patients.

**Disclosure:** No significant relationships.



F-064

## “CONTRADICTIONARY TRENDS” DETECTED IN PLASMA DNA TO DISCRIMINATE MULTIPLE PRIMARY LUNG CANCER FROM METASTATIC LUNG CANCER

Xin Wang, G. Che, L. Liu

*Department of Thoracic Surgery, West-China Hospital, Sichuan University, Chengdu, China*

### Objectives:

It is often difficult for radiologist and clinicians to distinguish multiple primary lung cancers from metastatic tumors when the neoplasm arises the same time or several years after the previous radical surgery. Our aim was to develop a novel molecular approach as a noninvasive test to differentiate tumor origin. The feasibility of analyzing genomic instability by microsatellite of plasma DNA to distinguish multiple primary lung cancers from metastatic tumors was evaluated.

### Methods:

Matched normal, tumor, and plasma samples were obtained from 12 patients with single lesion. DNA was extracted, and the samples were subjected to microsatellite analysis using 6 markers (D2S1363, D6S1056, D7S1824, D10S1239, D15S822, and D22S689). Tumor and plasma samples were collected from 12 patients with multiple lesions. Of these 12 patients, 8 patients diagnosed with multiple primary lung cancers and 4 patients diagnosed as pulmonary metastasis according to ACCP guideline.

### Results:

In single lesion group, of 72 plasma tests performed, 33 (45.8%) displayed positive results. Corresponding to the 43 tumor samples with positive result, 31 (72.1%) could also be detected in plasma sample. In 6 patients, some positive loci were only detected in tumor cells. In contrast, one patient, we detected two positive loci (D2S1363 D10S1239) only in plasma DNA. In the group of multiple lesions group, 8 of 12 patients showed “contradictory trend” and 4 showed “unique trend” utilizing plasma sample. While, by analyzing tumor sample, 10 of 12 patients showed “contradictory trend” and 2 showed “unique trend”.

### Conclusion:

The identical alteration of microsatellite could be observed in both blood and the tumor. With polymorphic microsatellite markers, the “contradictory trend” detected in tumor cells and plasma DNA that represents multiple primary tumors, assist in discriminating of MPLC and metastatic cancer, extending the diagnostic possibilities of plasma microsatellite DNA as a non-invasive follow-up tool.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****19:00 - 20:30****OSCAR NIGHT VIDEOS****V-065****IDENTIFICATION OF THE INTER-SEGMENTAL PLANE BY PUNCTURE AND INSUFFLATION OF THE TRANSECTED BRONCHUS DURING VIDEO-ASSISTED ANATOMICAL SEGMENTECTOMIES.**

H. Decaluwé, Lieven Depypere, A. Stanzi, L.C. Silva Corten, W. Coosemans, P. Nafteux, J. Moons, H. Van Veer, D. Van Raemdonck, P. De Leyn  
*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

Presentation of an instructive video of a technique that helps identify the inter-segmental plane during vats anatomical segmentectomies by puncture and insufflation of the transected segmental bronchus.

**Video description:**

From a prospectively managed database we selected all patients that were intended to undergo a vats anatomic segmentectomy and evaluated the feasibility and success of the technique. To prevent air-emboli, the bronchovascular structures of the segment are transected first, then the segment is insufflated by introducing an endoscopic needle into the transected bronchus. The parenchyma is then stapled along the demarcation line. Result Between 10/2013 and 12/2014, consecutively, 15 patients were scheduled for an anatomical segmentectomy. These consisted of segment 6 (n=6), upper trisegmentectomies (n=3), lingulectomies (n=3) and S6-sparing lobectomies (n=3). The technique was not used in two S6-sparing lobectomies; instead the rest of the lung was ventilated to see the border between S6 and the rest of the lobe. In one S6-resection the technique was not applied because an as broad as possible resection was the intention, instead of a transection according to the inter-segmental plane. In two patients a successful vats segmentectomy was performed, followed by a vats lobectomy during the same surgery because of too narrow margin. In 12 patients the bronchus was successfully punctured and the segment insufflated with air. In two of them the neighboring segments also inflated by 'cross-ventilation'. These resulted in an unclear demarcation. However, after a couple of minutes these segments deflated and the segments to resect did not, giving away a demarcation line. In the other 10 cases a clear demarcation was seen instantly. There were no conversions to open surgery.

**Conclusions:**

Puncture and insufflation of a transected bronchus is feasible and seems to help to find the inter-segmental plane during vats anatomical segmentectomies.

**Disclosure:** No significant relationships.



V-066

**ROBOTIC ASSISTED THORACOSCOPIC BRONCHOPLASTY:  
A NOVEL TECHNIQUE**

April Grant, W. Bolton, J. Stephenson, A. Hale, S. Ben-Or

*Thoracic Surgery, Greenville Health System, Greenville, United States of America*

**Objectives:**

The first video assisted thoracoscopic surgical (VATS) lobectomy and bronchoplasty was performed in 2002. The literature has established VATS as a safe and effective technique for lobectomy, however only a few cases have reported utilizing VATS for bronchoplasty. A VATS lobectomy with bronchoplasty is a complex procedure made more challenging by its limitation in visualization and instrumentation. The advent of robotic technology has expanded the utility of minimally invasive surgery. Robotic assisted lobectomy with bronchoplasty has been demonstrated in rabbit and human cadaver models; however, to our knowledge, this video demonstrates the first in vivo human robotic bronchoplasty.

**Video description:**

The DaVinci™ robot system was utilized to perform a right lower lobectomy with bronchoplasty in a patient with an exophytic tumor of the right lower lobe involving the bronchus intermedius. In an effort to preserve the right middle lobe, the resection necessitated excision of the superior segment of the right lower lobe bronchus to include a portion of the bronchus intermedius. The excision was performed using robotic endoshears and the bronchoplasty utilized intracorporeal robotic suturing. The bronchial suture line was then reinforced with a pleural flap.

**Conclusions:**

We successfully completed a robotic assisted thoracoscopic right lower lobectomy with bronchoplasty. An R0 resection was obtained and there were no intra-operative or postoperative complications. This video clearly shows that robotic assisted thoracoscopic lobectomy with bronchoplasty is a safe and effective technique.

**Disclosure:** W. Bolton: Instructor for Intuitive Surgical.

S. Ben-Or: Instructor for Covidien.

V-067

**INTRATHORACIC GIANT NEURILEMMOMA**P. Solli<sup>1</sup>, Alessandro Pardolesi<sup>2</sup>, F. Petrella<sup>2</sup>, M. Scarci<sup>1</sup>, L. Spaggiari<sup>2</sup><sup>1</sup>*Department of Thoracic Surgery, Papworth Hospital, Cambridge, United Kingdom*<sup>2</sup>*Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy***Objectives:**

Benign neurilemoma are commune neurogenic tumors arising in the mediastinum. Herein we report a case of a giant neurilemoma with total collapse of the left lung and significant mediastinal shift.

**Video description:**

Female, 63years, non smoker, no comorbidity. 1995 first evidence of a small lesion (Ø 1.5cm) at the apex of left hemithorax; at that time the patient refused surgery until April 2013 when she became symptomatic (dyspnea, cough) and lesion reached the diameter of 18cm. Thorax and MRI Ct-scan were performed with evidence of a well-capsulated mass, occupying the entire left hemithorax with significant mediastinal shift but no signs of chest wall infiltration nor vertebral body foramina invasion. 18FDG-PETscan displayed ipermetabolic activity with SUV=15 and the CT-guided biopsy revealed a spindle cell proliferation evocating a neurilemoma. Patient underwent surgical resection via a left hemiclamsshell incision. The procedure started with dissection of innominate and subclavian veins, epi-aortic vessels and left phrenic and vagus nerves. The tumor was well encapsulated and its origin was identified at the origin of foramen between D3-D4 vertebral bodies. Surgery was complicated by an important bleeding from the venous vertebral plexus at that level (total blood loss 2 liters). Postoperative outcome was characterized by the development on 8<sup>th</sup> postoperative day of sudden important headache in the upright position; MRI revealed initial cerebellum tonsils erniation and the presence of air in the dural sac due to cerebrospinal fluid leakage. The patient was conservatively treated with intravenous fluids, steroids and bed rest in supine position for 10 days. A second MRI revealed absence of air and appropriate position of cerebellum. Patient completely recovered and discharged on 24<sup>th</sup> postoperative day.

**Conclusions:**

Giant mediastinal neurogenic tumors might present important vascular connection; a careful preoperative evaluation is mandatory to adequately plan the surgical procedure and prevent vascular injury.

**Disclosure:** No significant relationships.



V-068

## THORACOSCOPIC THYMECTOMY IN A PATIENT WITH RIGHT AORTIC ARCH

Y. Seong<sup>1</sup>, H. Moon<sup>1</sup>, Samina Park<sup>2</sup>

<sup>1</sup>*Thoracic and Cardiovascular Surgery, SMG-SNU Boramae Medical Center, Seoul, Korea*

<sup>2</sup>*Department of Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea*

### Objectives:

In the setting of a right sided aortic arch with an aberrant left subclavian artery, anatomy differs from that of normal including different course of left recurrent laryngeal nerve. We would like to present a case of thoracoscopic thymectomy in a patient with right sided aortic arch, in which the anatomical difference is clearly demonstrated.

### Video description:

A 66-year old male patient was diagnosed with an anterior mediastinal mass, with right-sided aortic arch and an aberrant left subclavian artery and Kommerel's diverticulum. We performed thoracoscopic thymectomy which was approached from the left side, using three ports. Carbon dioxide gas insufflation was used for better visualization. Thymectomy began from left lower pole and proceeded cephaladly. Unlike from a normal anatomy, left common carotid artery was coursing parallel right behind the innominate vein. The mass was located between ascending right-sided aorta and main pulmonary artery. During thymectomy the left side of the trachea was well visualized juxtamedial to the aberrant left subclavian artery, and we paid great attention in this area not to damage the left recurrent laryngeal nerve which has been previously reported to course this area. Both the left & right cervical poles were carefully dissected, then right pleura was opened and right lower pole was dissected. Right internal mammary vein and right phrenic nerve were identified, and thymectomy was finished. The specimen was retrieved in an endoscopic retrieval bag. A single 24Fr. chest tube was placed which was later removed on the second postoperative day. The patient was discharged on the third postoperative day without any complications.

### Conclusions:

Thoracoscopic thymectomy was safely performed with the left-side approach in a patient with right-sided aortic arch. Careful dissection is needed not to damage the left recurrent laryngeal nerve. We hope our video to offer information about different anatomy of thymus in right-sided aortic arch.

**Disclosure:** No significant relationships.

**V-069****VIDEO-ASSISTED THORACOSCOPIC EXCISION OF A LARGE MEDIASTINAL GOITER**Trevor C Upham, M.B. Marshall*Department of Surgery, Thoracic Surgery, Georgetown University Hospital, Washington, United States of America***Objectives:**

Mediastinal thyroid goiters are frequently removed either via supracervical incision, median sternotomy or thoracotomy. Here we demonstrate safe VATS excision of a large ectopic thyroid goiter adherent to the innominate vein, superior vena cava, trachea, pulmonary artery and aorta.

**Video description:**

This video first provides a brief history of present illness, imaging, and description of port placement. The video then demonstrates the key steps of the operation which include: - The patient was positioned in left lateral decubitus with her arm and elbow abducted to open up the axilla; - Four 5mm VATS ports were placed from the fourth to seventh interspace in a diamond configuration; - Carbon dioxide insufflation and 30 degree scope were used; - The mass was dissected away from the innominate vein, superior vena cava, trachea, pulmonary artery and aorta using hook electrocautery, bipolar cautery as well as blunt dissection; - The azygos vein was divided using a vascular stapler for safer access to the posterior vena cava; - The mass was placed in a bag for removal after partial morselization; - Intercostal nerve blocks were placed from T3-T10; - A single straight chest tube was placed.

**Conclusions:**

Excision of a large mediastinal goiter can be safely performed using VATS even when the mass is adherent to the great vessels and trachea.

**Disclosure:** No significant relationships.





V-070

## THOROSCOPIC RESECTION OF A COMPLEX POSTERIOR MEDIASTINAL CYST

Trevor C Upham, J.P. Costello, M.B. Marshall

*Department of Surgery, Thoracic Surgery Georgetown University Hospital, Washington, United States of America*

### Objectives:

This video will review the technical strategies for the minimally invasive resection of a complex posterior mediastinal cyst which include port placement, right sided approach and the use of pediatric instruments.

### Video description:

This video first provides a brief history of present illness, a review of imaging studies, and a bidigital depiction of the anatomic challenge of the operation. The video then documents the critical steps of the procedure which include: -A right sided approach. -Traction suture placement on the diaphragm -Use of pediatric instruments and a laparoscopic liver retractor -Dissection of the mass off of the aorta, spine, thoracic duct, vena cava.

### Conclusions:

Posterior mediastinal cysts can be safely resected using minimally invasive techniques. A laparoscopic liver retractor and traction sutures facilitate working behind the liver in the right chest.

**Disclosure:** No significant relationships.

**TUESDAY, 2 JUNE 2015****07:30 - 09:00****ESTS– EACTA JOINT SESSION****F-071****IS PREOPERATIVE PROTEIN-RICH NUTRITION EFFECTIVE ON POSTOPERATIVE OUTCOME IN NON-SMALL CELL LUNG CANCER SURGERY? A PROSPECTIVE RANDOMIZED STUDY**

S.O. Kaya, Tevfik Ilker Akcam, K.C. Ceylan, O. Samancilar, O. Ozturk, O. Usluer  
*Thoracic Surgery, Dr. Suat Seren Chest Disease and Thoracic Surgery Training and Research Hospital, Izmir, Turkey*

**Objectives:**

Protein-rich nutrition is necessary for wound healing of after surgery. In this study, the accuracy of pre-operative nutrition support was investigated for non-small cell lung cancer patients who underwent anatomical resection.

**Methods:**

A prospective study was planned with the approval of our institutional review board. Fifty-eight patients were randomized who underwent anatomic resection in our department between January 2014 - December 2014. Thirty-one patients were applied a pre-operative nutrition program with immune modulating formulae (enriched with arginine, omega-3 fatty acids and nucleotides) for ten days. There were 27 patients in control group that was fed with only normal diet. Patients that were diabetic or patients that were applied bronchoplastic procedures or neoadjuvant therapy were excluded from the study. Patients' basal serum albumin levels, which was defined as the serum albumin level before any the nutrition program, and post-operative third day serum albumin levels were calculated and recorded with the other data.

**Results:**

Anatomic resection was performed by thoracotomy in 20 patients and 11 patients were operated by videothoracoscopy in nutrition program group. On the other hand 16 patients were operated by thoracotomy and 11 patients were operated by videothoracoscopy in the control group. Control group patients' third day albumin level decreased to 25.71% of the basal level, but this decrease was only 14,69% for nutrition program group patients and the difference was statistically significant ( $p < 0,001$ ). Complications occurred in 12 patients (44.4%) in control group against 6 patients in the nutrition group ( $p = 0,049$ ). Mean chest tube drainage time was 6 (1-42) days in control group against 4 (2-15) days for the nutrition program group ( $p = 0,019$ ).

**Conclusion:**

Preoperative nutrition is accurate in decreasing the complications and chest tube removal time in non-small cell lung cancer patients that were applied anatomical resection.

**Disclosure:** No significant relationships.

F-072

**PREOPERATIVE ASSOCIATION OF GABAPENTIN AND LIDOCAINE PATCH 5% FOR THE PREVENTION OF ACUTE POST-THORACOTOMY PAIN: A PROSPECTIVE AND RANDOMIZED STUDY**

Juan J Fibla<sup>1</sup>, J. Hernandez<sup>1</sup>, A. Guirao<sup>1</sup>, A. Sierra<sup>2</sup>, L. Molins<sup>1</sup>

<sup>1</sup>Thoracic Surgery, Sagrat Cor University Hospital and Hospital Clinic, Barcelona, Spain

<sup>2</sup>Anaesthesiology, Sagrat Cor University Hospital, Barcelona, Spain

**Objectives:**

To evaluate the impact of preoperative gabapentin associated to lidocaine patch on acute post-thoracotomy pain.

**Methods:**

Prospective randomized study of 70 patients submitted to thoracotomy for lung cancer. Patients were divided in two independent groups (anterior thoracotomy–AT– and posterolateral thoracotomy–PT–). In each group patients were randomized to receive preoperatively 1200 mg of gabapentin plus a lidocaine patch 5% placed in the area where the thoracotomy would be performed (Group A, n=35) vs no preoperative treatment (Group B, n=35). All the patients received postoperatively bolus of 15 ml of local anaesthetic –levobupivacaine– through a paravertebral catheter every 6h combined with methamisol (every 6h). Subcutaneous meperidine was employed as rescue drug. Group A patients received gabapentin 600 mg/12h during the first 72 postoperative hours. The level of pain was measured with the visual analogic scale (VAS) at 1, 6, 24, 48 and 72 h after surgery. The need of meperidine as rescue drug and secondary effects was also recorded.

**Results:**

We did not register significant secondary effects in relation to gabapentin and lidocaine patch. After gabapentine administration 7 patients (20%) referred somnolence and 2 (5.6%) dizziness. Ten patients (14%) needed meperidine as rescue drug (group A:3/group B:7). Mean VAS values were: all the cases (n=70):5.1+2.1, AT (n=38):4.5+2.1, PT(n=32):5.8+1.7, Group A (n=35):4.5+2.1, Group B (n=35):5.7+1.9, Group A + AT (n=19):4.0+2.2, Group B + AT (n=19):5.0+2.0, Group A + PT (n=16):5.1+1.6 and Group B + PT (n=16):6.5+1.7.

**Conclusion:**

The synergistic preoperative administration of gabapentin and a lidocaine patch placed in the anatomical area where the thoracotomy was going to be performed produced a significant decrease on the acute post-thoracotomy pain levels (4.5 vs 5.7,  $p<0.05$ ). Both gabapentin and lidocaine patch were safe and well tolerated. Further studies are warranted to define the role of preventive synergistic analgesia in thoracic surgical practice.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

F-073

**ROLE OF THE GLASGOW PROGNOSTIC SCORE AS A PROGNOSTIC INDICATOR FOR LUNG CANCER SURGERY**

Mitsuaki Kawashima<sup>1</sup>, T. Murakawa<sup>1</sup>, J. Ichinose<sup>1</sup>, T. Shinozaki<sup>2</sup>, H. Hino<sup>1</sup>, T. Tsuchiya<sup>1</sup>, T. Murayama<sup>1</sup>, C. Konoeda<sup>1</sup>, K. Nagayama<sup>1</sup>, J. Nitadori<sup>1</sup>, M. Anraku<sup>1</sup>, J. Nakajima<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, Graduate School of Medicine, the University of Tokyo, Bunkyo-ku, Tokyo, Japan*

<sup>2</sup>*Department of Biostatistics, Graduate School of Medicine, the University of Tokyo, Bunkyo-ku, Tokyo, Japan*

**Objectives:**

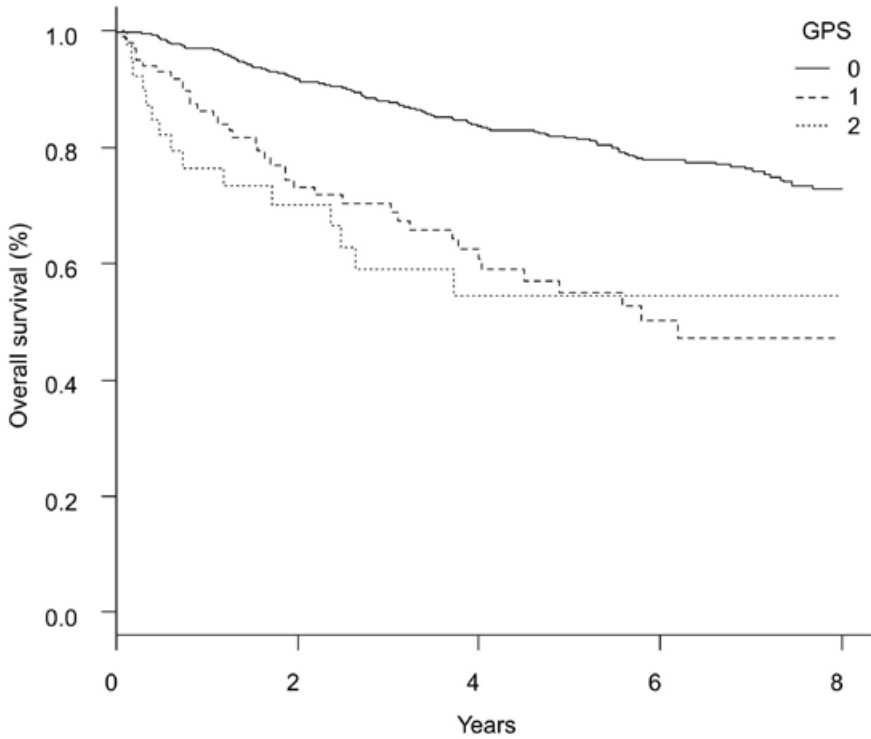
The Glasgow Prognostic Score (GPS), which consists of C-reactive protein (CRP) and albumin (Alb), is used as a prognostic factor in a variety of cancers. Here, we evaluated the role of the GPS in patients undergoing resection for primary lung cancer.

**Methods:**

We analysed 1043 patients with primary lung cancer who underwent potentially curative surgery between 1998 and 2012. The overall survival (OS) was estimated using the Kaplan-Meier method and compared using the log-rank test. Univariate and multivariate analysis of prognostic factors were assessed by Cox's proportional hazards regression model. The GPS was calculated based on cut-off values of 1.0 mg/dL for CRP and 3.5 g/dL for Alb as previously reported. A *P*-value of <0.05 was considered statistically significant.

**Results:**

There were 897 cases (86.0%) with GPS 0, 107 cases (10.2%) with GPS 1 and 39 cases (3.7%) with GPS 2. Five-year OS was 81.5 %, 54.9 % and 54.5% for the GPS 0, 1 and 2 (1 vs. 0: *P*<0.0001; 2 vs. 1: *P*=0.6590), respectively. Multivariate analysis revealed that age >75 (Hazard ratio (HR) = 1.8, 95% confidence interval (95%CI) 1.3-2.5), smoking habit (HR = 1.6, 95%CI 1.1-2.4), preoperative comorbidity (HR=2.3, 95%CI 1.6-3.1), higher CEA (HR=1.9, 95%CI 1.4-2.6), pathological stage (II vs. I: HR = 1.9, 95%CI 1.3-3.0; III vs. I: HR = 2.8, 95%CI 1.8-4.3), histologic tumour type (squamous cell carcinoma vs. adenocarcinoma (Ad): HR = 1.5, 95%CI 1.1-2.1; others vs. Ad: HR = 2.4, 95%CI 1.5-3.8), lymphovascular invasion (HR=2.2, 95%CI 1.5-3.2), surgical procedure (extended resection) (HR=2.0, 95%CI 1.3-3.1) and the GPS (1 vs. 0: HR = 1.6, 95%CI 1.1-2.4; 2 vs. 0: HR = 1.4, 95%CI 0.8-2.6) as independent prognostic factors for OS.



	Number at risk				
	0	2	4	6	8
GPS 0	896	686	452	262	121
GPS 1	106	57	34	19	8
GPS 2	39	20	11	6	5

**Conclusion:**

In lung cancer surgery, the GPS may be an independent prognostic indicator for the OS.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

**F-074****DOES SEGMENTECTOMY REALLY PRESERVE PULMONARY FUNCTION BETTER THAN LOBECTOMY FOR PATIENTS WITH EARLY STAGE LUNG CANCER?**

Hideki Suzuki<sup>1</sup>, J. Morimoto<sup>1</sup>, K. Nagato<sup>1</sup>, T. Nakajima<sup>1</sup>, T. Iwata<sup>1</sup>, S. Yoshida<sup>1</sup>, I. Yoshino<sup>1</sup>  
<sup>1</sup>General Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan

**Objectives:**

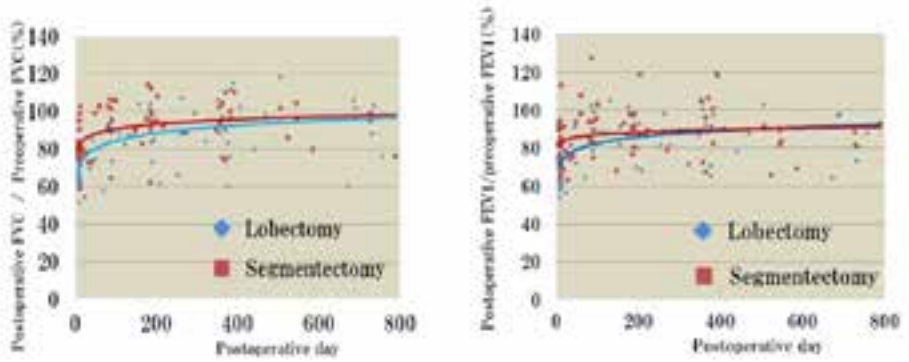
Although lobectomy was traditionally considered the standard surgical procedure for primary non-small cell lung cancer, segmentectomy for early staged lung cancer recently considered to yield outcomes equivalent to lobectomy. Controversy has still remained regarding the postoperative functional advantage in segmentectomy. The aim of this study is to compare the clinical outcomes and postoperative lung function after segmentectomy and lobectomy for non-small cell lung cancer.

**Methods:**

We retrospectively analyzed the patients, who had undergone segmentectomy (n=33) or lobectomy (n=27) for p-T1aN0M0 non-small cell lung cancer from 2009 to 2012. Functional testing included forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV1) at 5 periods (preoperatively, within 2, 6, 12 and more than 13 months postoperatively). To assess the chronological respiratory functional changes, the ratio of postoperative to preoperative FVC and FEV1 were compared between the two groups.

**Results:**

Clinical characteristics including preoperative lung functions showed no significant difference between the groups. The both rates of postoperative to preoperative values in FVC and FEV1 are significantly higher in the segmentectomy group than in the lobectomy group until 2 months after surgery; 81.8±9.5% vs. 70.7±8.9% ( $p<0.001$ ) for FVC, and 71.0±9.7% vs. 81.4±11.2% ( $p<0.01$ ) for FEV1. However, the ratios of the two groups were almost even at 6, 12 or more months after surgery. The ratios for FVC at 6 months after surgery was 95.5±11.5% in the segmentectomy group and 87.3±11.1% in the lobectomy group ( $p=0.06$ ), and the ratios for FVC in 12 or more after surgery was 93.4±13.1%, 95.4±11.3% in the segmentectomy group and 93.2±11.8%, 94.9±19.5% in the lobectomy group ( $p=0.97, 0.94$ ).



**Conclusion:**

Superiority of segmentectomy in pulmonary functional preservation was limited only in the early phase after surgery.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

**TUESDAY, 2 JUNE 2015****08:30 - 10:00****SESSION VIII: MIXED THORACIC I****F-075****DONOR LUNG ASSESSMENT USING SELECTIVE PULMONARY VEIN GASES**

Joseph Costa<sup>1</sup>, G. Singh<sup>1</sup>, S. Sreekanh<sup>1</sup>, K. Raza<sup>2</sup>, D. Lederer<sup>2</sup>, H. Robbins<sup>2</sup>, L. Shah<sup>2</sup>, J. Sonett<sup>1</sup>, S. Arcasoy<sup>2</sup>, F. D'Ovidio<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Columbia University Medical Center, New York, United States of America*

<sup>2</sup>*Division of Pulmonary, Allergy and Critical Care Medicine, Columbia University Medical Center, New York, United States of America*

**Objectives:**

Standard donor lung assessment relies on imaging, challenge gases and subjective interpretation of bronchoscopic findings, palpation and visual assessment. Central gases do not always represent true lung quality. We investigated using selective pulmonary vein (PV) gases to corroborate the subjective judgement during the intraoperative donor lung assessment.

**Methods:**

Starting 2012, donor lungs were assessed by intraoperative bronchoscopy, palpation, visual judgment of lung deflation upon temporary disconnection from ventilator, central gases from the aorta, and selective PV gases.  $pO_2 < 300$  on  $FiO_2$  of 1.0 were considered Low. CXR and last  $pO_2$  in ICU were also collected. Post-Tx primary graft dysfunction (PGD) and survival were monitored.

**Results:**

To date 292 donors have been assessed and 155 Tx's performed. Last  $pO_2$  in the ICU poorly correlated with intraoperative central  $pO_2$  ( $r=0.24$ ). Table shows the relationship of central  $pO_2$  with right and left inferior PV gases. Right inferior PV  $pO_2$  associated (Mann-Whitney,  $p<0.0001$ ) with findings at bronchoscopy (clean, median  $pO_2$  443, 25<sup>th</sup>-75<sup>th</sup> percentile range 349-512; poor 264, 178-408); palpation (good 463, 401-517, poor 264, 158-434); and visual assessment of compliance (compliant 429, 320-501, non compliant 205, 118-348). Left inferior PV  $pO_2$  associated ( $p<0.0001$ ) with findings at bronchoscopy (clean, median  $pO_2$  419, range 371-504; poor 254, 206-367); palpation (good 444, 400-517, poor 282, 211-419); and visual assessment of compliance (good 420, 349-496, poor 246, 129-330). At 72 hrs PGD 2 was in 9/155 (6%) and PGD3 in 10/155 (6.5%). 30 and 90-day mortalities were 3/155 (1.9%) and 7/155 (4.5%).



**Right Inferior Pulmonary Vein pO<sub>2</sub>**

	High	Low	
<b>Central pO<sub>2</sub></b>	High	39	146
	Low	20	23
	110	59	

False Positive Rate 66%, False Negative Rate 3%

**Left Inferior Pulmonary Vein pO<sub>2</sub>**

	High	Low	
<b>Central pO<sub>2</sub></b>	High	36	146
	Low	16	24
	118	52	

False Positive Rate 69%, False Negative Rate 7%

**Conclusion:**

Selective PV gases provide corroborative objective support to findings at bronchoscopy, palpation and visual assessment. Central gases do not always reflect true function of the lungs, having high false positive rate towards the individual lower lobe gas exchange. Objective measures of donor lung function may optimize donor surgeon assessment allowing for low PGD rates and low 90-day mortality.

**Disclosure:** No significant relationships.

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F-076

**HARMONIC® ULTRASONIC VERSUS ND:YAG AND ELECTROCAUTERY FOR NON-ANATOMIC LUNG RESECTION: AN EX VIVO STUDY**

Alfonso Fiorelli<sup>1</sup>, A. Reginelli<sup>2</sup>, A. Del Prete<sup>1</sup>, E. Carelli<sup>1</sup>, G. Messina<sup>1</sup>, D. Berritto<sup>2</sup>, S. Cappabianca<sup>2</sup>, R. Grassi<sup>2</sup>, M. Accardo<sup>3</sup>, M. Santini<sup>1</sup>

<sup>1</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

<sup>2</sup>*Radiology Unit, Second University of Naples, Naples, Italy*

<sup>3</sup>*Morpho-Cytopathologic Unit, Second University of Naples, Naples, Italy*

**Objectives:**

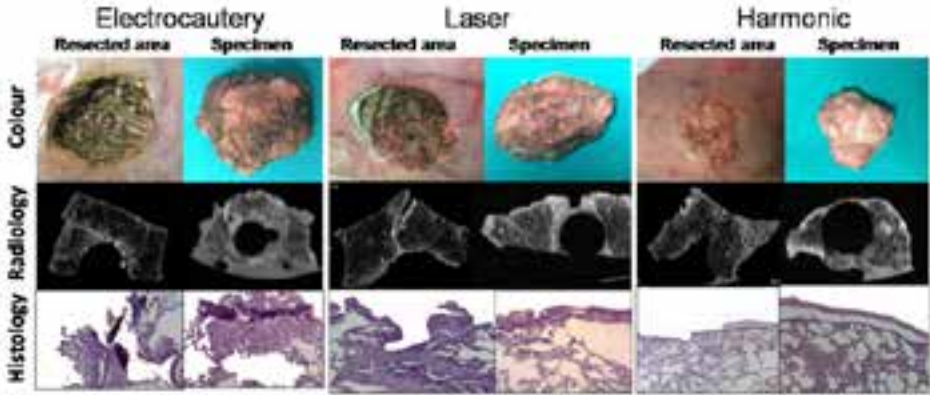
Harmonic Ultrasonic is used in thoracic surgery for haemostatic proprieties but no papers have investigated its use for lung resection, before the present. We evaluated the local tissue damage after non-anatomic lung resection using Harmonic compared with electrocautery, and Nd:YAG laser to estimate the feasibility of its clinical application.

**Methods:**

The study was conducted on 13 lungs taken from freshly slaughtered pigs. A capsule was implanted within parenchyma to simulate a tumor that was resected using Electrocautery, Nd:YAG laser, and Harmonic. The effects of each device on the resected area and on the specimen borders were evaluated in the light of (i) tissue colour variation (ranging from 0=no variation to 3=severe variation); (ii) parenchymal changes on T1 and T2-weighted Magnetic Resonance images (ranging from 0 to 3=severe changes compared to adjacent normal tissue); and (iii) histological tissue damage (ranging from 0 to 3=severe damage for the presence of >70% of oedematous and swollen cells). The intergroup differences were evaluated using ANOVA test.

**Results:**

Each study group included 25 non-anatomical resections. The surface of resected area and the borders of specimen of Electrocautery group showed a significant colour and radiological changes, and a more dramatic tissue damage compared with Harmonic and Laser group. Despite no significant, Harmonic versus Laser group presented less changes on colour, radiological and tissue damage of resected area and specimen (Figure 1).



Variables	Place	Electrocautery	Laser	Harmonic	p-Value
Color	Resected area	2.2 ± 0.5*	0.8 ± 0.1	0.5 ± 0.2	<0.05**
	Specimen	2.2 ± 0.5*	0.6 ± 0.4	0.4 ± 0.5	<0.05*
Radiology	Resected area	2.4 ± 0.5*	1.3 ± 0.4	1.0 ± 0.2	<0.05**
	Specimen	2.3 ± 0.4*	1.2 ± 0.4	1.0 ± 0.2	<0.05*
Histology	Resected area	2.5 ± 0.5*	1.4 ± 0.5	1.1 ± 0.3	<0.05**
	Specimen	2.3 ± 0.4*	1.2 ± 0.4	1.0 ± 0.2	<0.05*

**Conclusion:**

Our results confirmed the clinical feasibility of Harmonic for assessing small non-anatomical lung resection. It minimized the local tissue damage of resected area and specimen, facilitating the lung healing and avoiding ambiguous histological findings. For example, the necrosis within specimen borders may mimic cancer. However, our data should be confirmed by in vivo studies.

**Disclosure:** No significant relationships.

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F-077

**IDEAL POSITION OF SINGLE CHEST DRAIN AFTER LOBECTOMY-SEGMENTECTOMY?**

H. Melek, A.S. Bayram, M.M. Erol, G. Cetinkaya, Cengiz Gebitekin  
*Thoracic Surgery, Uludag University Faculty of Medicine, Bursa, Turkey*

**Objectives:**

Most of the surgeons place conventional two chest tubes to manage air leak and drainage after lung resection. The use of a single chest tube is an effective according to some randomized studies. However, the ideal place of the chest tube may vary in accordance with the resection type. In this study, we aimed to investigate effectiveness and ideal position of single chest tube placed after lobectomy/segmentectomy.

**Methods:**

The data was prospectively recorded and retrospectively reviewed that consisted of 173 out of 220 patients undergoing anatomic lung resection (excluding pneumonectomies, mortality and the patients who had two chest tube after resection) and placement of single chest tube after resection between January 2013 and September 2014. There were 128 males and 45 female with a mean age of 57,3y. Patients with single chest tube were divided into three groups; anterior (group 1, n=68), lateral (group 2, n=60), and posterior (group 3 n=45), respectively. We compared the results of complications (prolonged air leak, space and pleural effusion), additional chest tube insertion and the duration.

**Results:**

The study group consisted of 147 lobectomy and 26 segmentectomy. The mean duration of single tube is 5,9 day. Prolonged air leak was observed in 33(19%) patients. The second chest tube insertion was necessary in 20 (11,6%) patients. There was no statistically significant difference between the groups (table 1). However, considering patients undergoing only upper lobectomy, patients in group 3 required more additional drainage than the other groups ( $p=0,03$ ). On the other hand, significantly less morbidity was observed in lower lobectomy group compared to upper/middle lobectomy ( $p=0,04$ ).

Table 1. The characteristics of the patients

	Anterior	Lateral	Posterior	Total	p
Case Number	68	60	45	173	
Male	54 (79%)	43 (72%)	31 (69%)	128 (74%)	0,19
Mean Age	57,3 (17-76)	57,5 (21-74)	57,2 (20-75)	57,3 (17-76)	
Malignancy	56 (82%)	52 (86,7%)	35 (78%)	143 (82,7%)	0,49
DLCO %	80 (50-101)	73(48-130)	71 (42-94)	75 (42-130)	0,78
Videothoracoscopy	15 (22%)	16 (26,7%)	10 (22%)	41 (23,7%)	0,79
Lobectomy	59 (87%)	48 (80%)	40 (89%)	147 (85%)	0,09
UL - Bilobectomy Sup	40 (59%)	23 (38%)	17 (38%)	80 (46%)	
LL - Bilobectomy Inf.	15 (22%)	20 (33%)	20 (44%)	55 (32%)	
Middle Lobectomy	4 (6%)	5 (8%)	3 (7%)	12 (7%)	
Segmentectomy	9 (13%)	12 (20%)	5 (11%)	26 (15%)	0,13
Upper Lobe	8 (12%)	9 (15%)	2 (4%)	19 (11%)	
Lower Lobe	1 (1%)	3 (5%)	3 (7%)	7 (4%)	
The Use of Fibrin Glue	27 (39,7%)	24 (40%)	14 (31%)	65 (37,5%)	0,65
Side					0,96
Right	37 (54%)	34 (57%)	25 (56%)	96 (55,5%)	
Left	31 (46%)	26 (43%)	20 (44%)	77 (44,5%)	
Prolonged Air Leak (PAL)	14 (20,6%)	11 (18%)	8 (18%)	33 (19%)	0,91
Complication	10 (15%)	13 (21,7%)	12 (26,7%)	35 (20%)	0,28
Space	8 (12%)	6 (10%)	8 (18%)	22 (12,7%)	0,47
Effusion	1 (1,5%)	4 (6,7%)	5 (11%)	10 (6%)	0,09
Extra Tube	4 (6%)	9 (15%)	7 (15,6%)	20 (11,6%)	0,17
Duration of Tube (Day)	6,3 (3-27)	6,5 (2-30)	4,7 (2-14)	5,97 (2-30)	0,7
Hospitalization Time (Day)	6,9 (3-35)	6,5 (2-26)	5,1 (3-8)	6,33 (2-35)	0,7

UL: upper lobectomy, LL: lower lobectomy

### Conclusion:

Placement of single chest tube is an effective in most of the patients after lobectomy/bilobectomy and segmentectomy. Anterior-lateral drain placement after upper lobectomy and posterior drain placement after lower lobectomy is more effective.

**Disclosure:** No significant relationships.

F-078

**SUMMARIZED INSTITUTIONAL EXPERIENCE OF PEDIATRIC AIRWAY SURGERY**

Konrad Hoetzenecker<sup>1</sup>, T. Schweiger<sup>1</sup>, M. Leonhard<sup>2</sup>, I. Roesner<sup>2</sup>, D. Denk-Linnert<sup>2</sup>, B. Schneider-Stickler<sup>2</sup>, W. Bigenzahn<sup>2</sup>, W. Klepetko<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, Medical University of Vienna, Vienna, Austria*

<sup>2</sup>*Division of Phoniatrics and Logopedics, Medical University of Vienna, Vienna, Austria*

**Objectives:**

The management of pediatric airway stenosis is complex and requires a dedicated team, consisting of thoracic surgeons, ENT surgeons, pediatricians and anesthetists. The majority of pediatric laryngotracheal stenosis is a sequela of prematurity and prolonged postpartal intubation/tracheostomy. Surgical correction is often difficult due to a frequent combination of glottic and subglottic defects.

**Methods:**

In 2012 the Laryngotracheal program Vienna was launched. Since then, 18 pediatric patients were surgically treated for (laryngo-) tracheal stenosis.

**Results:**

The mean age of our patients was 62 months (range: 2-180). Laryngotracheal stenosis extending up to level of the vocal cords was evident in nine patients. Four children were diagnosed with an isolated subglottic and two with tracheal stenosis. Three patients had a long-segment congenital malformation together with vascular ring anomalies. Five children were pre-treated by rigid endoscopy before surgical correction, 9 out of our 18 patients had a tracheostomy at the time of operation. Different techniques of corrections were applied: laryngotracheal reconstruction (n=4), extended partial cricotracheal resection (n=4), cricotracheal resection with or without anterior split or dorsal mucosal flap (n=4), slide tracheoplasty (n=2), tracheal resection (n=4). In eight patients a rib cartilage interposition was necessary in order to obtain a sufficient lumen enlargement and in seven of these patients an LT-Mold was placed to stabilize the reconstruction. We lost two patients, who were referred to our institution after failure of multiple preceding interventions, two and three months after the operation. Twelve patients are currently in an excellent, two are in an acceptable condition without a need for an intervention. One patient required an endoscopic re-intervention 18 months after the operation, one child is currently still cannulated.

**Conclusion:**

Pediatric airway surgery is complex and requires a dedicated interdisciplinary team. An armamentarium of different resection and reconstruction techniques is necessary in order to achieve good long-term results.

**Disclosure:** No significant relationships.



F-079

**RISK FACTORS OF POSTOPERATIVE ANXIETY AND DEPRESSION AFTER SURGICAL TREATMENT OF LUNG CANCER**Samina Park<sup>1</sup>, C.H. Kang<sup>1</sup>, Y. Hwang<sup>1</sup>, Y. Seong<sup>2</sup>, H.J. Lee<sup>1</sup>, I.K. Park<sup>1</sup>, Y.T. Kim<sup>1</sup><sup>1</sup>*Department of Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea*<sup>2</sup>*Thoracic and Cardiovascular Surgery, SMG-SNU Boramae Medical Center, Seoul, Korea***Objectives:**

Psychological distress associated with cancer treatment is an emerging issue in the management of cancer patients. The aim of this study was to identify prevalence and risk factors of postoperative anxiety and depression after surgical treatment of lung cancer.

**Methods:**

The patients who underwent curative surgical resection due to primary lung cancer were included in this study. The patients with complicated treatment history (recurrent or metastatic lung cancer or neo-adjuvant treatment) and the patients taking psychiatric medication were excluded. We prospectively evaluated the degree of pre- and postoperative anxiety and depression using the questionnaire, Hospital Anxiety Depression Scale. Clinical factors associated with lung cancer and social factors associated with the patients were analyzed.

**Results:**

A total of 278 of patients were enrolled and mean age was 62 years. Thoracoscopic resection was performed in 246 patients (88.5%). The prevalence of preoperative anxiety and depression were 7.9% (n=22) and 11.5% (n=32) and they changed to 9.4% (n=26) and 19.4% (n=54) postoperatively (p-value=0.374, <0.001, respectively). Gender, age, marital status, advanced stage, alcohol abuse, smoking status, length of hospital stay, pulmonary function, and preoperative comorbidities were not associated with postoperative anxiety and depression. Multivariate analysis revealed that thoracotomy was a risk factor of postoperative anxiety, when adjusted by preoperative anxiety (OR=4.5, p-value=0.002). As for risk factors of postoperative depression, thoracotomy (OR=3.4, p-value=0.009), postoperative dyspnea (OR=4.8, p-value<0.001), severe pain (OR=3.9, p-value=0.001), and diabetes mellitus (OR=3.0, p-value=0.012) were identified after adjusting by preoperative depression. Twenty four patients were referred to mental health professionals and provided supportive psychotherapy or pharmacologic intervention. Among them, 14 patients (56%) were diagnosed with adjustment disorder.

Risk factors of postoperative anxiety and depression						
	<b>Anxiety (n=26)</b>					
	Univariate analysis			Multivariate analysis		
	OR	CI (95%)	P-value	OR	CI (95%)	P-value
Body Mass Index	0.883	(0.761-1.024)	0.100			NA
Preoperative anxiety	4.425	(1.559-12.562)	0.003	5.610	(1.873-16.803)	0.002
Thoracotomy	4.222	(1.661-10.734)	0.005	4.563	(1.731-12.029)	0.002
Postoperative complication	2.435	(1.020-5.812)	0.040			NA
Pain (VAS $\geq$ 5)	2.404	(1.031-5.607)	0.038			NA
Dyspnea	2.029	(0.900-4.573)	0.083	2.136	(0.910-5.017)	0.081
Low level of education	2.254	(0.994-5.110)	0.047			NA
	<b>Depression (n=54)</b>					
	Univariate analysis			Multivariate analysis		
	OR	CI (95%)	P-value	OR	CI (95%)	P-value
Age $\geq$ 65	2.033	(1.103-3.749)	0.021			NA
Body Mass Index	0.873	(0.782-0.976)	0.017			NA
DM	1.956	(0.962-3.977)	0.061	3.057	(1.274-7.335)	0.012
Employed	0.513	(0.267-0.984)	0.042			NA
Thoracotomy	2.473	(1.111-5.505)	0.023	3.461	(1.360-8.808)	0.009
Pain (VAS $\geq$ 5)	3.163	(1.665-6.007)	<0.001	3.969	(1.810-8.704)	0.001
Dyspnea	4.889	(2.577-9.277)	<0.001	4.856	(2.312-10.200)	<0.001
Preoperative depression	10.392	(4.660-23.176)	<0.001	17.103	(6.435-45.452)	<0.001
Low level of education	1.934	(0.996-3.755)	0.049			NA





**Conclusion:**

Postoperative psychological distress especially postoperative depression increased after surgical treatment of lung cancer. Postoperative anxiety and depression were aggravated by residual symptoms after surgery, however thoracoscopic surgery had a preventive role for postoperative anxiety and depression.

**Disclosure:** No significant relationships.

## F-080

**SUBLOBAR RESECTIONS VS. LOBECTOMY FOR STAGE I NON-SMALL CELL LUNG CANCER: AN APPROPRIATE CHOICE IN HIGH-RISK ELDERLY PATIENTS?**

A. Fiorelli<sup>1</sup>, F.P. Caronia<sup>2</sup>, N. Daddi<sup>3</sup>, D. Loizzi<sup>4</sup>, L. Ampollini<sup>5</sup>, N.P. Ardò<sup>4</sup>, R. Potenza<sup>6</sup>, P. Carbognani<sup>5</sup>, F. Ardissoni<sup>7</sup>, F. Sollitto<sup>4</sup>, S. Mattioli<sup>3</sup>, F. Puma<sup>8</sup>, M. Santini<sup>1</sup>,  
Mark Ragusa<sup>6</sup>

<sup>1</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

<sup>2</sup>*Thoracic Surgery, Mediterranean Oncologic Institut, Catania, Italy*

<sup>3</sup>*Thoracic Surgery Unit, University Hospital of Bologna, Bologna, Italy*

<sup>4</sup>*Thoracic Surgery, University of Foggia, Foggia, Italy*

<sup>5</sup>*Department of Surgical Sciences, Thoracic Surgery, University Hospital of Parma, Parma, Italy*

<sup>6</sup>*Thoracic Surgery Unit, University of Terni, Terni, Italy*

<sup>7</sup>*Thoracic Surgery Unit, University of Turin, Orbassano, Italy*

<sup>8</sup>*Thoracic Surgery Unit, University of Perugia, Perugia, Italy*

**Objectives:**

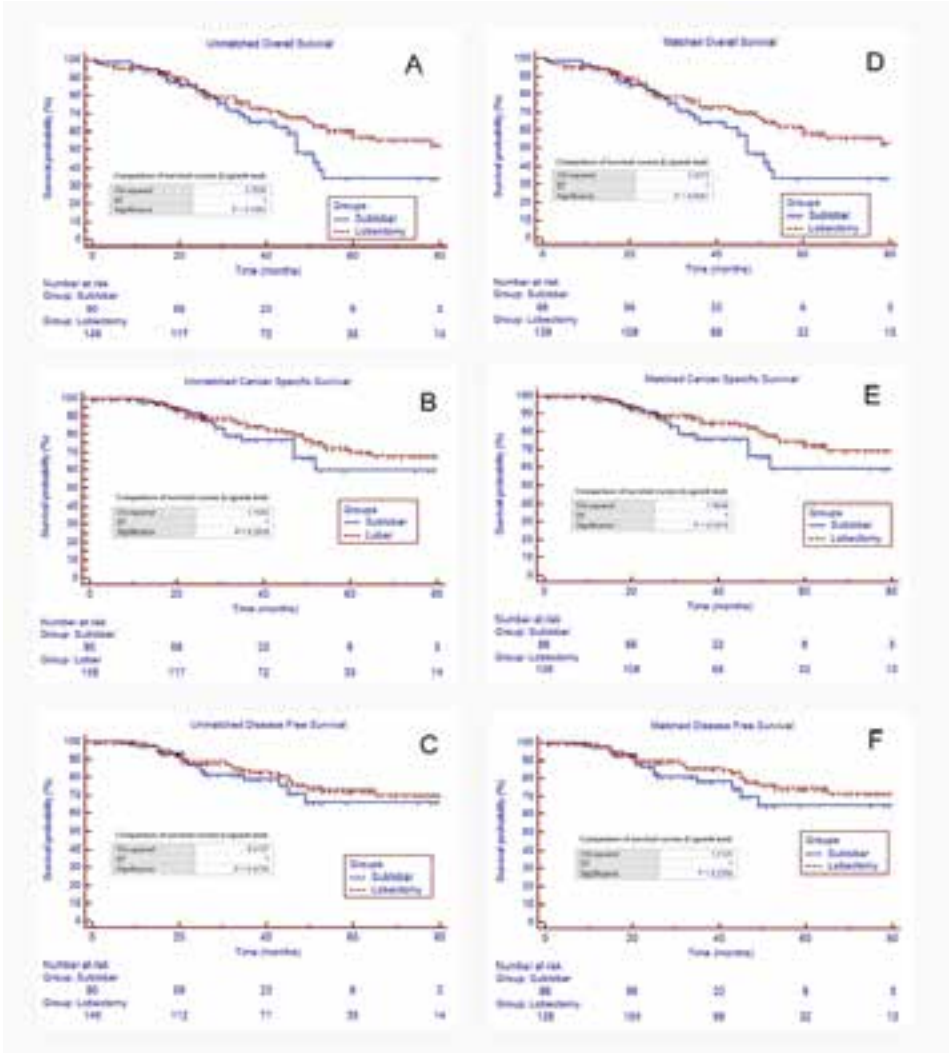
Even though lobectomy remains the standard therapy for NSCLC, sublobar resections are commonly used for elderly patients with serious co-morbidities and poor cardio-pulmonary reserve. We investigated if sublobar resections, performed as a compromise solution, afforded recurrence and survival rates equivalent to lobectomy in high-risk elderly patients, a still controversial issue due to paucity of literature data.

**Methods:**

This is a retrospective multicenter study including consecutive patients aged > 75 years operated for Clinical Stage I NSCLC between January 2007 and December 2013. Clinico-pathological data, postoperative morbidity and mortality, recurrence rate and vital status were retrieved. Overall survival (OS), cancer specific survival (CSS) and disease-free survival (DFS) were assessed. Kaplan-Meier method, Log-rank test, Cox regression analysis and propensity score matching were used in the statistical analysis.

**Results:**

239 patients (median age: 78 years) were enrolled. Lobectomies were performed in 149 (62.3%) patients, sublobar resections in 90 (39 segmentectomies, 51 wedge resections). Sublobar group patients had a lower ppoFEV1% (50±20 versus 69±18; p<0.0001) and ppoDLCO% (56±10 versus 71±14; p<0.0001) and a higher Charlson comorbidity index (8.5±0.9 versus 6.4±1.1; p<0.0001) while lobectomy patients had a higher incidence of unexpected pN2 disease (9% versus 2%; p=0.3) probably due to different attitudes regarding lymphadenectomy. There was no significant difference in postoperative morbidity (p=0.5), mortality (p=0.9), OS (p=0.1, Figure 1/A), CSS (p=0.2; Figure 1/B), and DFS (p=0.2; Figure 1/C) between the two groups of patients. Even after adjusting for 1:1 propensity-matching score and matched pair analysis, results were unchanged (Figure 1 D/E/F). Tumor size (p=0.01) and pN2 disease (p=0.003) were independent negative prognostic factors.



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**Conclusion:**

Our data showed that high-risk, elderly patients may benefit from sublobar resections which provide similar postoperative morbidity and mortality rates and equivalent long-term survival, compared to lobectomy. Future prospective studies should corroborate such results.

**Disclosure:** No significant relationships.

## F-081

**VARIABILITY IN LENGTH OF STAY AFTER UNCOMPLICATED PULMONARY LOBECTOMY: IS THERE AN OPTIMAL LENGTH OF STAY?**

M. Smith<sup>1</sup>, G. Giambone<sup>2</sup>, A. Poon<sup>2</sup>, L. Gaber-Baylis<sup>3</sup>, X. Wu<sup>2</sup>, S. Paul<sup>1</sup>, A. Bhat<sup>4</sup>, R. Zabih<sup>4</sup>, N. Altorki<sup>1</sup>, P. Fleischut<sup>2</sup>, Brendon Stiles<sup>1</sup>

<sup>1</sup>*Department of Cardiothoracic Surgery, Weill Cornell Medical College, New York, United States of America*

<sup>2</sup>*Department of Anesthesiology, Weill Cornell Medical College, New York, United States of America*

<sup>3</sup>*Department of Healthcare Policy And Research, Weill Cornell Medical College, New York, United States of America*

<sup>4</sup>*Computer Science, Cornell University, Ithaca, United States of America*

**Objectives:**

Previous studies have identified predictors of prolonged length of stay (LOS) following pulmonary lobectomy. However, LOS typically has a direct relationship to postoperative complications. We sought to determine the LOS and factors associated with variability after uncomplicated pulmonary lobectomy.

**Methods:**

Analyzing the State Inpatient Databases, Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality database, we reviewed lobectomies performed (2009-2011) in California, Florida, and New York. LOS and comorbidities were identified. Multivariable regression analysis (MVA) was used to determine factors associated with LOS greater than the mean. Patients with postoperative complications or death were excluded.

**Results:**

Among 22,647 lobectomies performed, we identified 13,099 patients (58%) with uncomplicated postoperative courses. Median age was 67; 44% were male; 76% were white, 57% Medicare; and median DEYO comorbidity score was 3. The majority of cases (55%) were performed by open thoracotomy, while 45% were VATS/robotic. Despite the lack of complications, there was a wide distribution in LOS (Figure 1). Mean LOS for the entire cohort was 5.6 days (SD:3.8; Range 0-75). By MVA, predictors of prolonged LOS included thoracotomy (OR 2.6, CI 2.4-2.8) vs. VATS/robotic approach, age  $\geq 75$  (OR 1.4, CI 1.2-1.7), male gender (OR 1.2, CI 1.1-1.3), state procedure performed (California [OR 1.3, CI 1.2-1.] or Florida [OR 1.3, CI 1.2-1.5] vs. New York), Medicaid payer (OR 1.9, CI 1.6-2.3) vs. Medicare, COPD (OR 1.6, CI 1.4-1.8), renal disease (OR 1.6, CI 1.3-1.9), and CHF (OR 1.6, CI 1.2-2.2).

**Conclusion:**

Variability exists in LOS following even uncomplicated pulmonary lobectomy. Variability is driven by clinical factors including age, gender, payer, and comorbidities, but also by regional variation and surgical approach. All of these factors should be taken into account when designing clinical care pathways or when allocating payment resources. Attempts to define an optimal LOS depend heavily upon the patient population studied.



**Disclosure:** A. Bhat: Analytical Care. Private company of which author is part owner.  
R. Zabih: Analytical Care. Private company of which author is part owner.  
P. Fleischut: Analytical Care. Private company of which author is part owner.

**F-082****SMARTPHONE APPLICATION FOR FAST LUNG CANCER RISK ASSESSMENT**

Zalan Szanto, I. Benkő, L. Jakab, G. Szalai, A. Vereczkei  
*Department of Thoracic Surgery, University of Pécs, Pécs, Hungary*

**Objectives:**

The importance of the early NSCLC diagnosis is inevitable but 75% of the cases are still diagnosed in an advanced, inoperable stage. Screening with IdCT of the high risk population can improve the early diagnosis, but it might be aggravated by the complex task of risk group selection and recruitment. The aim of our study was to create and test a novel way to select and manage high risk population for NSCLC with smart communication devices. Mobile phones, tablets offering fast data analysis and record via software applications adding the possibility of geographical localisation with GPS coordinates.

**Methods:**

We constructed a free lung cancer risk assessment application (LungScreen) for Android and iOS mobile platforms. The application calculates and shows individual NSCLC risk based on Bach's protocol after collecting demographic data, smoking status, possible environmental harms of the participant. Based on GPS coordinates the high risk participant is navigated to the nearest Screening Center for further investigation. We analysed the records of the application in a two month test period aided by an informative campaign in Hungary.

**Results:**

In the two months test period 6141 participants downloaded and completed the risk assessment test (Male/Female 3888/2253, Age range 8-89 years, mean age 36,01 year). 3081 participants were active smokers, high risk criteria was calculated in 519 cases, in which further screening investigation were suggested. 5113 results were from Hungary, 1028 tests from 28 other countries (e.g. Germany, France, UK, USA, Japan etc)

**Conclusion:**

Lung cancer risk assessment via mobile devices allows free, fast and efficient way to select, manage and localize high risk population for NSCLC. By omitting the complex recruitment process it can aid to initiate screening trials. Giving immediate personalised feedback and individual direction to diagnostic centers can facilitate early diagnosis of operable NSCLC cases.

**Disclosure:** No significant relationships.



F-083

**NON-STEROIDAL ANTI-INFLAMMATORY DRUGS INCREASE RECURRENCE RISK FOLLOWING SURGICAL PLEURODESIS FOR PRIMARY PNEUMOTHORAX**

Peter Yu, H. Lim, N. Yam, A. Sihoe

*Department of Surgery, The University of Hong Kong, Hong Kong***Objectives:**

Non-steroidal anti-inflammatory drugs (NSAID) have been shown to reduce the histopathological quality of pleurodesis in animal studies, but their effect on pleurodesis in humans has not been investigated.

**Methods:**

During January 1999 - January 2003 - when NSAIDs were still commonly used following pneumothorax surgery - 176 consecutive patients received video-assisted thoracic surgery (VATS) pleurodesis for primary pneumothorax (exclusions: secondary pneumothorax or previous pleurodesis). Recurrence defined as any new clinically or radiographically detected ipsilateral pneumothorax following surgery was documented.

**Results:**

At the surgeon's discretion, an NSAID (Naproxen) was used for postoperative analgesia in 44 patients (25%). All major demographic and clinical factors were similar amongst the NSAID and control patients (Table 1). After a median follow-up of 162.4 months (range 143-191 months), 11 patients (25%) in the NSAID group had recurrence, compared to 12 patients (9%) in the control group (HR=2.97 [95% CI 1.14-7.79], p=0.006). Life table analyses demonstrated no significant effect of NSAID on recurrence in the first 6 months (HR=2.50 [95% CI 0.64-9.77], p=0.118), but significantly higher recurrence at 9 months (HR = 3.54 [95% CI 1.01-12.48], p=0.015) and thereafter. History of smoking is paradoxically associated with lower recurrence risk (HR=6.17 [95% CI 2.72-13.97], p<0.001). The effect of NSAID on recurrence is more pronounced in non-smokers (HR = 3.46 [95% CI 1.21-9.89], p=0.003), but not significant in smokers (HR=1.53 [95% CI 0.11-21.24], p=0.725). The mean total dose of NSAID use showed a trend of association with recurrence (Recurrence: 2113 mg; No recurrence: 1803 mg; p=0.053). Recurrence was not correlated with any other demographic or clinical variables. Use of NSAID failed to reduce pain scores on post-op day 1.

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	Entire cohort	NSAID group	Control group	p value
Number of procedures	176	44	132	
<b>Demographic variables</b>				
Male	150 (85.2%)	38 (86.4%)	112 (84.8%)	1.000
Mean age (years)	24.9	24.5	25.0	0.850
Smoker	81 (46.0%)	20 (45.5%)	61 (46.2%)	1.000
<b>Operative variables</b>				
Rebleeds/leak	120 (68.2%)	40 (90.9%)	110 (83.3%)	0.329
Infection/Chemical pleurodesis	89 (51.1%)	25 (56.8%)	64 (48.5%)	0.585
Post-operative air leak	45 (24.4%)	11 (27.3%)	31 (23.5%)	0.885
Mean pain score on post-op day 1 (0-10 point scale)	1.19	1.39	1.11	0.715
Residual air space on CXR before discharge	32 (18.2%)	12 (27.3%)	20 (15.2%)	0.342

**Conclusion:**

Use of NSAIDs after surgical pleurodesis for primary pneumothorax increases recurrence risk, while being ineffective in pain control. Routine NSAIDs use following surgical pleurodesis should be avoided, particularly for non-smokers.

**Disclosure:** No significant relationships.



**TUESDAY, 2 JUNE 2015****09:00 - 10:30****SESSION IX: PULMONARY NEOPLASTIC II****F-084****SURGICAL MANAGEMENT OF MULTIFOCAL GROUND GLASS OPACITIES OF THE LUNG**

Aritoshi Hattori, K. Suzuki, T. Matsunaga, K. Takamochi, S. Oh  
*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

Efficacy of surgical management for multifocal ground glass opacity (GGO) lesions has not been well known. The aim of this study was to evaluate the clinical characteristics and surgical outcome in patients underwent pulmonary resection for multifocal GGOs of the lung.

**Methods:**

Between 1996 and 2012, 131 patients underwent surgical resections for multiple lung cancers. Multifocal GGO (MFGGO) lesions was defined that all of the tumors showed GGO dominant appearance with a consolidation/tumor ratio (CTR)  $\leq 0.5$  on thin-section CT findings.

**Results:**

Among 131 patients, 53 (40%) showed MFGGO. They revealed female predominance, less frequent smoking status, smaller tumor size, lower CEA and SUVmax level than those of non-MFGGO ( $p=0.0061, 0.0179, 0.0001, 0.0038, 0.0001$ ). Furthermore, MFGGO showed significantly larger number of GGOs with a mean of 5.3 (range, 2-41) ( $p<0.0001$ ). The total number of MFGGO lesions was 278. Histologically, they revealed invasive or minimally invasive adenocarcinoma in 171 (51%) lesions, adenocarcinoma in situ in 72 (26%) and atypical adenomatous hyperplasia in 62 (22%), and only 3 (1%) showed inflammatory lesions. EGFR and K-ras mutations were detected in 57% and 7%, respectively. Sublobar resection was indicated in 80% of synchronous surgery. Of the 34 patients underwent staged surgery, sublobar resections were indicated in 33 (97%), including re-anatomical pulmonary resections in 5 (14.7%), namely, lobectomy or segmentectomy followed by previous ipsilateral segmentectomy or lobectomy. Local recurrence was found in 2 (3.8%). Unresected or new GGOs have been developed in 19 (36%) patients, all of which remained pure-GGO less than 10mm and followed by thin-section CT. The 5-year survival rate after surgical resections for MFGGO and non-MFGGO was 97.6% and 74.6% ( $p=0.0097$ ).

**Conclusion:**

Acceptable local control and long-term surgical outcomes could be obtained for multifocal GGO lesions of the lung by aggressive curative resections combined with limited resections.

**Disclosure:** No significant relationships.

F-085

**INDOCYANINE GREEN FLUORESCENCE FOR LOCALIZATION OF HUMAN LUNG CANCER; A PRELIMINARY ANIMAL STUDY**

Kentaro Hirohashi<sup>1</sup>, T. Anayama<sup>1</sup>, H. Wada<sup>1</sup>, T. Kato<sup>1</sup>, S. Keshavjee<sup>1</sup>, K. Orihashi<sup>2</sup>, K. Yasufuku<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, Toronto General Hospital, Toronto, Canada*

<sup>2</sup>*Department of Surgery, Kochi University, Kochi, Japan*

**Objectives:**

Recent advance in CT technology has enabled detection of small pulmonary nodules. Minimally invasive thoracic surgery is becoming the standard of care for surgical resection of such tumors. However, localization of small lung tumor is a challenge. The purpose of this study was to determine the optimal interval between Indocyanine green (ICG) administration and the detection of ICG fluorescence at the tumor site, and clarify the feasibility of ICG fluorescence to localize pulmonary nodules.

**Methods:**

Subcutaneous xenograft model study: Nude mice and human non-small cell lung cancer cell lines (A549, H460, and MGH-7) were used for this study (n=3/cell line). 2mg/kg of ICG was administered intravenously and fluorescence images were obtained using *in-vivo* fluorescence imager. The tumor to background ratio (TBR) was calculated. Orthotopic lung cancer model study: Detection of i.v. administered ICG fluorescence in lung cancer was examined in human orthotopic lung cancer xenograft model. Eleven mice and H460 cells were used for this study. Based on the results of the previous study, potential optimal intervals were determined, followed by ICG fluorescence imaging of lung cancer.

**Results:**

The peak of TBRs was at 24-72h after ICG administration regardless cancer cell types. The subcutaneous tumor to normal lung ratio in A549 mice was much higher compared to those in H460 and MGH-7 mice ( $p<0.001$ ). 9h, 48h and 120h were selected as the potential optimal intervals. The lung cancer to normal lung ratio was much higher at 48h after ICG administration compared to those at 9h and 120h after ICG injection ( $p<0.0001$ ).

**Conclusion:**

ICG fluorescence exhibited the peak TBR at 48h after systemic administration. Further study using the high sensitivity fluorescence endoscope may enable detection of ICG fluorescence in lung cancer. It may be one of the fundamental basis for proceeding to clinical trials.

**Disclosure:** No significant relationships.



F-086

**WHAT IS THE DEFINITION OF “PART-SOLID TUMOR” IN LUNG CANCER?**

Takeshi Matsunaga, K. Takamochi, S. Oh, K. Suzuki

*General Thoracic Surgery, Juntendo University, Tokyo, Japan***Objectives:**

One of the matter of debate as to early lung cancer is the method of evaluation of ground glass opacity (GGO) on thin-section computer tomography (CT). The word, “Part Solid” is frequently misused and there has been no consensus for this terminology. We proposed a simple resolution for this debate.

**Methods:**

A retrospective study was conducted on consecutive 775 patients with resected lung cancer of clinical stage IA between 2008 and 2013. All patients underwent preoperative thin-section CT and authors reviewed radiological findings for all cohorts. We divided part-solid tumor (PST) having component of ground glass and consolidation into two categories using radiologic criteria of consolidation/tumor ratio (C/T ratio) 0.5 and lung cancers were classified into four groups as follows; A: pure ground glass nodule (pGGN) (C/T ratio=0), B: Ground glass-predominant PST (GP-PST) ( $0 < \text{C/T ratio} < 0.5$ ), C: Consolidation-predominant PST (CP-PST) ( $0.5 \leq \text{C/T ratio} < 1$ ), D: Solid tumor (ST) (C/T ratio=1). We investigate clinicopathological features in four groups and the prognosis between GP-PST and CP-PST.

**Results:**

The incidence of nodal involvement was 11.2% (87/775). Among four groups, 0% (0/130) in pGGN, 0% (0/127) in GP-PST, 4.3% (8/185) in CP-PST and 23.7% (79/333) in ST (p-value < 0.0001). The incidence of lymphatic invasion was 0% (0/130) in pGGN, 0.8% (1/127) in GP-PST, 16.8% (31/185) in CP-PST and 46.2% (154/333) in ST (p-value < 0.0001). Among PST lung cancers, predictors for lymphatic invasion were C/T ratio (GP-PST vs CP-PST) (HR=20.631, 95%CI: 2.755-154.508) and Tumor size (T1a vs T1b) (HR=3.228, 95%CI: 1.413-7.375) in multivariate analysis. And the differences in recurrence-free survival between GP-PST and CP-PST were statistically significant (98.9% vs. 96.6% (3y), 98.9% vs. 91.3% (5y), p-value=0.044).

**Conclusion:**

“Part-Solid Tumor (PST)” included two categories as to invasiveness and prognosis on the radiologic criteria of C/T ratio 0.5. We should distinguish between ground glass-predominant PST and consolidation-predominant PST and those terminologies should be strictly defined to investigate early lung cancer.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

F-087

**PREOPERATIVE LOW BODY MASS INDEX AND ELEVATED SERUM C-REACTIVE PROTEIN ARE RISK FACTORS FOR THE MORTALITY AFTER LUNG RESECTION OF NON-SMALL-CELL LUNG CANCER IN SMOKERS**

Masashi Nagata, H. Ito, T. Matsuzaki, H. Furumoto, T. Isaka, T. Nishii, H. Nakayama  
*General Thoracic Surgery, Kanagawa Cancer Center, Yokohama, Japan*

**Objectives:**

Body mass index (BMI) has been reported to be risk factor for the prognosis of advanced lung cancer. Even in patients with resectable lung cancer, not a few heavy smokers have chronic obstructive pulmonary disease (COPD) and are lean, which may suggest pulmonary cachexia. Inflammation induced by COPD or lung cancer is supposed to be one of causes promoting cachexia. We hypothesized that preoperative BMI and CRP were risk factors for the patients with non-small-cell lung cancer (NSCLC) who adopted curative lung resection, especially in smokers. The purpose of this study was to analyze whether this hypothesis has validity.

**Methods:**

We retrospectively reviewed 678 patients who underwent curative lobar resection for NSCLC in our hospital from 2006 to 2010. Median age at operation was 68 (range 35-90). Median follow up period was 60 months (2-108). They were divided into 421 smokers and 257 non-smokers. For each groups, we investigated the clinico-pathological factors associated with shorter overall survival (OS).

**Results:**

In smokers group, there were 355 males and 66 females. Median Brinkman index in this group was 840. 3-year and 5-year OS were 86.1%, and 75.9%. Of 111 deaths in this group, 68 were due to lung cancer. In multivariate analysis, BMI $\leq$ 20.6 ( $p=0.040$ , RR 1.62 (1.02-2.54)) and preoperative CRP $\geq$ 0.13 ( $p=0.037$ , RR 1.56 (1.03-2.40)) were significantly associated with higher mortality as well as high age, male, advanced pathological stage, poor blood gas test. Comorbidity and respiratory function test were neither related. On the other hand, in non-smokers group, BMI and CRP were not associated to poorer prognosis either.

**Conclusion:**

Low BMI and slightly elevated CRP were predictive factors for shorter OS after lung resection for NSCLC in smokers, which were independent of factors related to lung cancer. We further need to recognize the importance of nutritional control and COPD management.

**Disclosure:** No significant relationships.



F-088

**SURGICAL APPROACH IS SUPERIOR TO PALLIATIVE TREATMENT IN OLIGOMETASTATIC LUNG CANCER**

Till Ploenes, A. Lopez-Pastorini, C. Ludwig, E. Stoelben  
*Thoracic Surgery, Lung Clinic Cologne, Cologne, Germany*

**Objectives:**

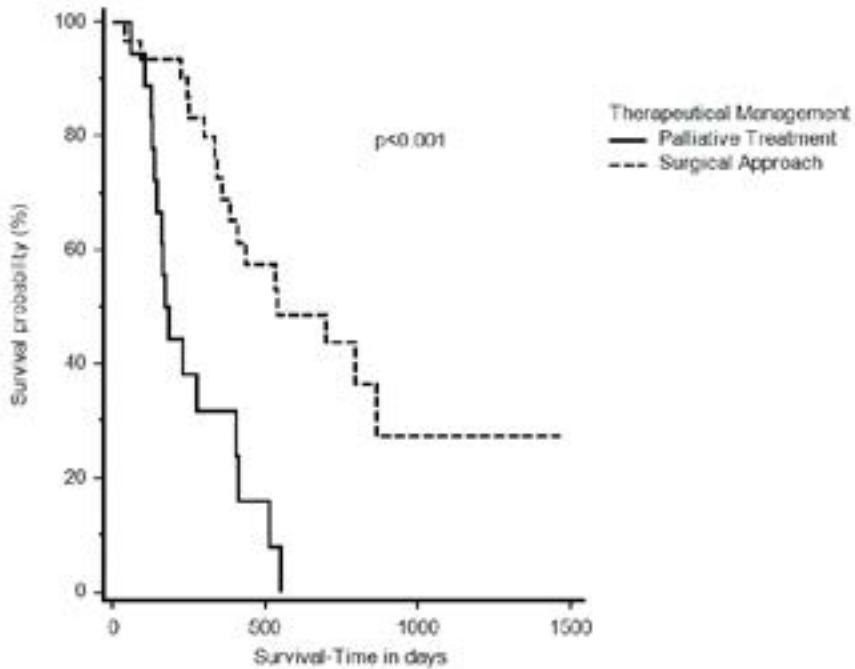
The prognosis of metastatic lung cancer is poor and chemotherapy can improve the median survival for only a few months. In this study, we compared two groups of patients with oligometastatic lung cancer, who received palliative treatment or multimodal treatment with surgical approach.

**Methods:**

We conducted a retrospective review of all patients with synchronous extrapulmonary oligometastatic disease diagnosed between 2010 and 2013. All Data were extracted from the medical database of our department and further analysed.

**Results:**

There were 52 patients diagnosed for oligometastatic lung cancer between 2010 and 2014. A cohort of 32 patients was treated surgically in a multimodal approach, but 19 patients refused surgery. These patients were treated by palliative chemotherapy or other palliative treatment like radio-chemotherapy etc. Mean overall survival was 438 days in the surgically treated group and 256 days in the palliative group ( $p < 0.001$ , Fig.1). In the surgically treated group, survival was correlated to pathologic T stage (pT1 957, pT2 449 and pT3 469 days mean overall survival time, respectively,  $p < 0.05$ ) and lymph node involvement (with mediastinal lymph node involvement 578 and without mediastinal lymph node involvement 756 days mean overall survival time). *Fig.1 Survival of patients, ether treated in a combined surgical/multimodal approach or palliative management. (Mean overall survival of 438 days in the surgical treated group and 256 days in the palliative group,  $p < 0.001$ ).*

**Conclusion:**

Based on our data we concluded that an aggressive surgical approach in oligometastatic NSCLC can result in a notable benefit for patients with an acceptable mortality and morbidity. A prospective randomized study is necessary and may be feasible.

**Disclosure:** No significant relationships.



F-089

**30-MORTALITY AFTER LUNG CANCER RESECTION CANNOT BE USED AS AN INDIVIDUAL SURGEON QUALITY OUTCOME IN THORACIC SURGERY**

Chiara Proli, M.E. Cufari, H. Raubenheimer, M. Al-Sahaf, L. Shedden, G. Luciano, M. Mesa-Guzman, E. Lim

*Department of Thoracic Surgery, Royal Brompton Hospital, London, United Kingdom*

**Objectives:**

In October 2014 the SCTS released data on individual surgeon volume and Trust performance for lung cancer resection. The implicit assumption is benchmarking of the performance. We sought to determine the impact of individual surgeon volume in relation to each death associated with the average 30-day mortality rate of 2.2% using conventional SCTS data driven performance control limits (i.e. funnel plots).

**Methods:**

Data released by the SCTS were downloaded, compiled and analysed. Each step change for individual mortality was calculated, and alter limits were modelled using (SCTS conventional) binomial 99% confidence limit.

**Results:**

Data from 29 units were published with the annual volume of 125 surgeons for 2012. Data from 6 surgeons were excluded for no lung resections performed. In the remaining 118 surgeons, the mean (SD) annual lung resection volume for cancer was 42 (27). A total of 25% of surgeons performed 18 resections (or less) per year. For 50% of surgeons undertaking 40 resections (or less) each death represents at least 2.5% (0 to 13%) of their annual work load. Using a 99% binomial confidence limit at 50 cases, the upper alert is 16%. Therefore for the majority of surgeons, a mortality rate of 15% which is 7.5 fold higher than average would not trigger the conventional SCTS alert limits.

**Conclusion:**

Lung cancer resection volumes for individual surgeons are low and for the majority each patient death carries a disproportionately high weighting that may encourage risk adverse behaviours whilst simultaneously failing to detect 7.5 fold increased mortality rates using conventional SCTS limits.

**Disclosure:** No significant relationships.

**F-090****SURVIVAL OF PATIENTS WITH CLINICAL STAGE IIIA N2 NON-SMALL CELL LUNG CANCER: IMPACT OF THE NEW CATEGORIZATION OF N2 INVOLVEMENT ON 3<sup>RD</sup> EDITION ACCP GUIDELINES ACCORDING TO TYPES OF MULTIMODALITY THERAPY**

Yoshihisa Shimada, Y. Kato, J. Maeda, K. Yoshida, M. Hagiwara, M. Kakihana, N. Kajiwara, T. Ohira, N. Ikeda

*Department of Thoracic Surgery, Tokyo Medical University, Tokyo, Japan*

**Objectives:**

Patients with c-IIIa N2 NSCLC show a broad spectrum of disease in both the extent and bulk of nodal involvement. The significance of the 3<sup>rd</sup> edition ACCP categorization of radiological N2 status will therefore be considered. The aim of this study is to examine the treatment outcomes according to types of multimodality therapy.

**Methods:**

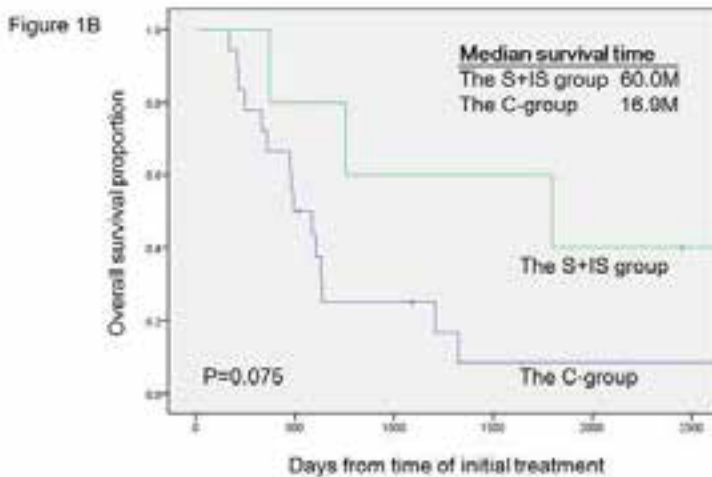
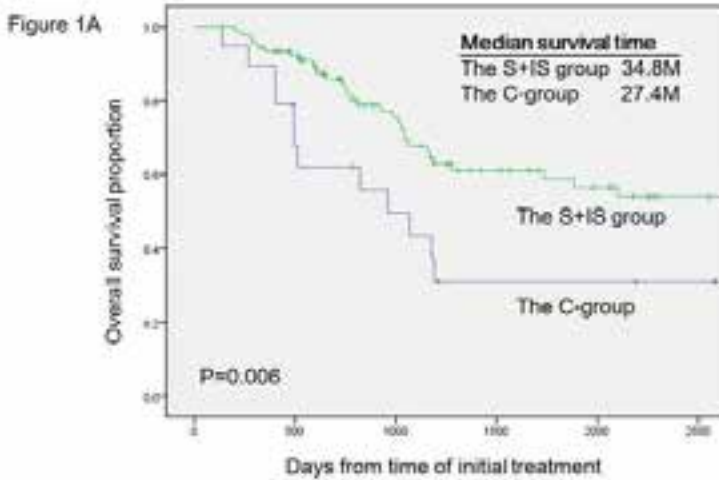
We retrospectively reviewed a database of 175 patients with c-IIIa N2 NSCLC who underwent surgery followed by adjuvant chemotherapy (S-group: n=72), induction treatment followed by surgery (IS-group: n=56), and chemoradiotherapy (C-group: n=47) from January 2001 through December 2013. The patient of the IS and C-group were administered platinum-based chemotherapy with a third or fourth generation agent. The cN2 status was stratified into 2 groups; discrete N2 (DN2) and infiltrative N2 (IN2).

**Results:**

The 5-year overall survival (OS) rates for the S, IS, and C-group were 46%, 57%, and 19% (p<0.001), respectively. The ACCP classification was a significant prognostic indicator, but the number of involved station was not; the 5-year OS rates for DN2 and IN2 were 54% and 17% (p<0.001). In the patients who underwent surgery (the S+IS-group, n=128), 95% of the patients had DN2, whereas in the C-group, 51% of the patients had DN2 (p<0.001). The 5-year OS rates for DN2 were 59% in the S+IS-group, and 31% in the C-group (p=0.006) and those for IN2 were 40% and 8% (p=0.075). In the S+IS-group, the proportion of cN2/pN2 was 52%, the proportion of R0 resection was 95%, and sex was significant for OS on multivariate analysis. The proportion of clinical and pathological downstaging was 51% and 49%, and all the patients who underwent pneumonectomy survived 5 years in the IS-group.



Overall survival rates estimated from time of initial treatment according to N2 involvement status: discrete N2 (Figure 1A) and infiltrative N2 (Figure 1B).



**Conclusion:**

Our results demonstrated that the ACCP categorization is usefulness for predicting prognosis, and the S+IS group showed better OS, especially in DN2 status.

**Disclosure:** No significant relationships.

Tuesday A.M.  
 Abstracts 071 - 105

**F-091****EVOLUTION OF LUNG SPARING STRATEGY BY SLEEVE LOBECTOMY AND INDUCTION THERAPY FOR NON-SMALL CELL LUNG CARCINOMA: 20 YEAR-EXPERIENCE AT A SINGLE INSTITUTION**

Tetsuzo Tagawa, T. Iwata, T. Nakajima, H. Suzuki, K. Nagato, T. Yamamoto, T. Inage, J. Morimoto, K. Tanaka, T. Yun, T. Kamata, S. Yoshida, I. Yoshino  
*General Thoracic Surgery, Chiba University, Chiba, Japan*

**Objectives:**

To elucidate the evolution of lung-sparing strategy avoiding pneumonectomy by sleeve lobectomy and induction therapy for central non-small cell lung carcinoma.

**Methods:**

We retrospectively reviewed the records of 2047 patients with non-small cell lung carcinoma who underwent surgery at our institution between 1994 and 2013. There were 152 patients who underwent broncho ± angioplastic sleeve lobectomy (SL) and 54 patients who underwent pneumonectomy (PN). Patient demographics and outcomes between the two groups were compared by t-test, x2 analysis and log-rank test. Then, the study period was divided into 4 periods with 5 years each and the trends of surgical strategy were analyzed focusing on SL/PN ratio.

**Results:**

PN showed a significantly advanced pathological stage, and a larger tumor size than SL, whereas there were no significant differences in age, histology, the ratio of complete resection (PN: 96.3%, SL: 93.4%) and 30-day mortality rate (PN: 3.7%, SL: 0%) between the two groups. Overall 5-year survival rate of SL was significantly higher than that of PN (31.1% vs 14.8%,  $p=0.0024$ ). The ratio of PN in total surgeries significantly decreased over the 4 periods (1994-1998, 1999-2003, 2004-2008, 2009-2013) from 5.63% to 3.17%, 1.40% and 1.38%, respectively ( $p=0.0002$ ). In contrast, the SL/PN ratio significantly increased over the 4 periods from 1.64 to 2.50, 3.71 and 5.56, respectively ( $p=0.041$ ). During the last period (2009-2013) when we introduced induction therapy for patients with central tumors or with mediastinal nodal involvement, 38 out of 651 who received surgery underwent induction therapy. The SL/PN ratios of those who underwent induction therapy and who did not were 15 (PN: 1, SL: 15) and 4.38 (PN: 8, SL: 35), respectively.

**Conclusion:**

Lung-sparing strategy by sleeve resection could decrease the ratio of pneumonectomy to less than 2% and improved long-term outcome. Induction therapy seemed to facilitate the sleeve resection and increase the SL/PN ratio.

**Disclosure:** No significant relationships.



F-092

## IMPACT OF PATIENT SELECTION AND TREATMENT STRATEGIES ON OUTCOMES AFTER LOBECTOMY FOR BIOPSY-PROVEN STAGE IIIA PN2 NON-SMALL CELL LUNG CANCER

Chi-Fu Jeffrey Yang<sup>1</sup>, R.R. Meyerhoff<sup>2</sup>, K.L. Anderson<sup>1</sup>, S. Adil<sup>1</sup>, M. Hartwig<sup>1</sup>, D. Harpole<sup>1</sup>, T. D'Amico<sup>1</sup>, M. Berry<sup>3</sup>

<sup>1</sup>*Surgery, Duke University, Durham, United States of America*

<sup>2</sup>*Immunology, Duke University, Durham, United States of America*

<sup>3</sup>*Cardiothoracic Surgery, Stanford University, Stanford, United States of America*

### Objectives:

We evaluated the impact of patient selection and treatment strategies on long-term outcomes of patients who had lobectomy after induction therapy for stage IIIA pN2 non-small cell lung cancer.

### Methods:

The impact of various patient selection, induction therapy and operative strategies on survival of patients with biopsy-proven stage IIIA pN2 NSCLC who received induction chemotherapy followed by lobectomy from 1995-2012 was assessed using Cox proportional hazard analysis.

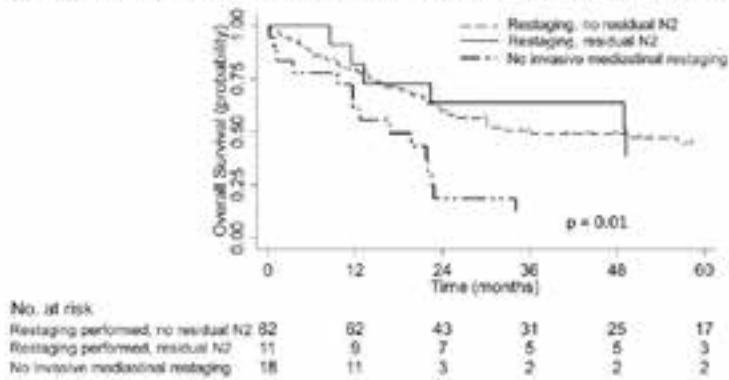
### Results:

From 1995-2012, 111 patients had lobectomy for stage IIIA pN2 NSCLC after induction chemotherapy with an overall 5-year survival of 39%. Compared to induction chemotherapy alone, patients given additional induction radiation were more likely to have down-staging from N2 to N0 (66% vs 40%,  $p=0.006$ ) but had worse 5-year survival in univariate analysis (31% vs 48%,  $P=0.03$ ). Patients who did not have residual N2 disease by mediastinal restaging had a 5-year survival of 45% compared with 38% for patients who were noted to have residual microscopic N2 disease by restaging and 12% for patients who did not undergo restaging (figure) ( $p=0.01$ ). Patients who had multistation residual N2 disease on final pathology were more likely to have not undergone mediastinal restaging prior to resection (OR 7.1,  $p=0.009$ ). In multivariable analysis, the particular induction therapy strategy or surgical approach used, as well as the extent of mediastinal disease were not important predictors of survival. However, increasing age (HR, 1.03;  $P=0.04$ ) and lack of invasive mediastinal restaging (HR 2.02;  $P=0.02$ ) predicted worse survival.

### Conclusion:

For stage IIIA pN2 NSCLC, treatment with induction chemoradiation does not improve survival over induction chemotherapy alone. The strategy of assessing response to induction therapy with pathologic mediastinal restaging allows one to select appropriate patients for complete resection and is associated with an excellent 5-year overall survival of 39% in this population.

## Survival of Stage IIIA pN2 Patients Stratified by Invasive Mediastinal Restaging Approach



**Disclosure:** C.J. Yang: American College of Surgeons Resident Research Scholarship.

R.R. Meyerhoff: Medical Scientist Training Program T32GM007171 (RRM).

M. Hartwig: Grant support included the NIH funded Cardiothoracic Surgery Trials Network, 5U01HL088953-05.

T. D'Amico: Consultant for Scanlan International, Inc.

M. Berry: Grant support included the NIH funded Cardiothoracic Surgery Trials Network, 5U01HL088953-05.

**TUESDAY, 2 JUNE 2015****10:30 - 12:30****ESTS – PORTUGUESE - BRAZILIAN JOINT SESSION****F-093****DETECTION ON NEUROENDOCRINE LUNG TUMOURS BY SOMATOSTATIN RECEPTORS (SSTR2 AND SSTR5): IMPROVING THEIR DIAGNOSIS AND FOLLOW-UP**

José María Matilla<sup>1</sup>, H. Borrego<sup>2</sup>, A. Cueto<sup>3</sup>, P. Becerra<sup>4</sup>, C. Simon<sup>5</sup>, M. Cebollero<sup>5</sup>, R. Guijarro<sup>6</sup>, E. Pastor<sup>6</sup>, I. Muguruza<sup>7</sup>, S. Vicente<sup>7</sup>, M. García Yuste<sup>1</sup>, Emetne-Separ Members<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University Hospital Valladolid, Valladolid, Spain*

<sup>2</sup>*Pathology, University Hospital Valladolid, Valladolid, Spain*

<sup>3</sup>*Thoracic Surgery, Virgen de las Nieves Hospital, Granada, Spain*

<sup>4</sup>*Pathology, Virgen de las Nieves Hospital, Granada, Spain*

<sup>5</sup>*Thoracic Surgery, Gregorio Marañón Hospital, Madrid, Spain*

<sup>6</sup>*Thoracic Surgery, University General Hospital Valencia, Valencia, Spain*

<sup>7</sup>*Thoracic Surgery, Jimenez Díaz Foundation, Madrid, Spain*

**Objectives:**

To study in lung neuroendocrine carcinomas - typical carcinoid (CT), atypical carcinoid (AC) and large cell neuroendocrine carcinoma (LCNC) - the presence of somatostatin receptors (SSTR 2 and SSTR5), to improve the clinical monitoring of patients in order to detect the tumour recurrence.

**Methods:**

Patients undergoing surgery for lung neuroendocrine tumours in the last two years (86 cases in five centers): 53 TC, 25 AC and 8 LCNC. • 2.1. Determination of somatostatin receptors (SSTR2 and SSTR5) in lung neuroendocrine tumoural tissue. • 2.2. Clinical follow-up of patients: thoracoabdominal helicoidal CT and SPECT-CT-111 In-pentetreotide. Periodicity 6, 12 and 24 months • 2. 3. Analysis of the correlation of findings between the two scans (Chi square and Fisher exact test) and follow-up of patients (tumour recurrence and survival, Kaplan Meier).

**Results:**

The receptors' presence in the different analyzed tumours is showed itself in the Table 1.A. There is not significant correlation between the receptors' presence and the findings of Nuclear Medicine ( $p=0.53$ ). The absence of somatostatin receptors type 2 (SSTR2) in the tumoural tissue associates a major incident of metastases ( $p=0.025$ ) (Table 1.B: Correlation between somatostatin receptors and metastases at follow-up.). There are not significant differences in the survival of the patients in relation with the presence of both somatostatin receptors in our sample ( $p=0.894$ ).

A.		SSTR +		SSTR2 +		SSTR 5 +	
Expression of SSTR	n	n	%	n	%	n	%
Typical Carcinoid	53	36/40	90.0	29/40	72.5	35/40	87.5
Atypical Carcinoid	25	20/21	95.2	12/21	57.1	18/21	85.7
Large Cell NC	8	6/6	100	4/6	66.7	6/6	100
Global	86	62/67	92.5	45/67	67.2	59/67	88.1

B.		p					
Correlation SSTR receptors / metastases	n	SSTR +		SSTR2 +		SSTR 5 +	
		Chi2	Fisher	Chi2	Fisher	Chi2	Fisher
Typical Carcinoid	2	0.613	1	<b>0.025</b>	<b>0.003</b>	0.565	1
Atypical Carcinoid	3	0.676	1	0.105	0.229	0.445	1
Large Cell NC	4	—	—	0.361	1	—	—
Global	9	0.217	0.500	0.517	0.707	0.136	0.339

Table 1. A: Expression of somatostatin analogues receptors. B Correlation of expression of somatostatin analogues receptors and metastases at follow-up.

SSTR + : Indistinct expression of at least one of the two receptors

SSTR2 + : Expression of SSTR2

SSTR5 + : Expression of SSTR5

### Conclusion:

- Evaluation of somatostatin receptors SSTR 2 and SSTR5 in tumour tissue could be a useful tool in the assessment of prognosis in these patients.
- The study in tumor tissue of somatostatin receptors, especially SSTR2, in view of our result, showed importance for diagnosis, treatment and monitoring of patients with neuroendocrine lung tumours.

**Disclosure:** No significant relationships.



F-095

**TEACHING VATS TO RESIDENTS IN A NATIONAL COURSE:  
JOINING FORCES TO PROVIDE HIGH-STANDARD EDUCATION**

Ricardo Mingarini Terra<sup>1</sup>, L. Losso<sup>2</sup>, M. Ghefter<sup>3</sup>, A.W. Mariani<sup>1</sup>, D.R. Pinto Filho<sup>4</sup>

<sup>1</sup>*Thoracic Surgery, Heart Institute (InCor) - University of São Paulo Medical School, São Paulo, Brazil*

<sup>2</sup>*Center for Minimally Invasive Thoracic Surgery, Edmundo Vasconcelos Hospital São Paulo, São Paulo, Brazil*

<sup>3</sup>*Thoracic Surgery, Hospital do Servidor Público Estadual de São Paulo, São Paulo, Brazil,*

<sup>4</sup>*Thoracic Surgery, Universidade de Caxias do Sul, Caxias do Sul, Brazil*

**Objectives:**

Teaching VATS in a standardized way may be very difficult for several residency programs due to barriers as lack of local structure, material, or expertise. Moreover, the low number of residents in each program makes it difficult to establish a dedicated course locally. A national course including residents and preceptors from programs all over the country could help overcome such challenges. Therefore, our objective was to evaluate feasibility and results of a unified national VATS course for thoracic surgery residents.

**Methods:**

The Brazilian Thoracic Surgery Society organized a national VATS course, which was offered to all thoracic surgery residents in their last year of residency. The course content was divided in 4 days with 2 months intervals between them. In each day they learned some theory (positioning, ports, surgical movies) and practical exercises. We used a progressive approach, presenting exercises with increasing complexity. We used virtual simulators and pig heart-lung block models in a specifically designed black box. We evaluated students' satisfaction, theory through a final test and practical skills in a field test with the heart-lung block as previously proposed by D'Amico.

**Results:**

Twenty-four out of twenty-seven eligible residents participated in the four days of course. 85% considered the course excellent in an anonymous survey and 15% very good. 90% considered that the skills learned during the course will be very important in their professional life. Mean final test grade was 84 (+7.5) and in the final exercise with the heart-lung block in the black box, they were able to perform a lobectomy in a mean of 43 (+18) minutes.

**Conclusion:**

Adherence was very high and the course achieved high levels of satisfaction. Despite heterogeneity, final grades and black box exercise showed that students developed cognitive and practical skills. A national VATS course for residents was feasible and provided cutting-edge education.

**Disclosure:** R.M. Terra: scientific consultant at Johnson & Johnson.

**F-096****WEB-BASED THORACIC SURGERY ONLINE COURSE: INCREASING ACCESS, CONNECTING PEOPLE AND DECREASING INEQUALITIES. FEASIBILITY RESULTS**

P. Nabuco De Araujo<sup>1</sup>, Ricardo Mingarini Terra<sup>2</sup>, A.W. Mariani<sup>2</sup>, A. Dela Vega<sup>1</sup>, P. Pego-Fernades<sup>2</sup>

<sup>1</sup>*Thoracic Surgery, ICESP, São Paulo, Brazil*

<sup>2</sup>*Thoracic Surgery, Heart Institute (InCor) - University of São Paulo Medical School, São Paulo, Brazil*

**Objectives:**

Access to knowledge, information and quality education is a huge issue in many countries. Web-based technologies are considered powerful resources to spread knowledge and are supposed to improve access to better education. Nevertheless, very few initiatives have evaluated feasibility and efficiency of these methods in the field of thoracic surgery. The purpose of this study was to evaluate the implementation and feasibility of an exclusively on-line thoracic surgery course.

**Methods:**

We designed an 8-month on-line course based on an open-source learning software (MOODLE) focusing on thoracic oncology. It was divided in fifteen 2-week modules, each of them including activities as cornerstone articles reading, forum discussion, and recorded classes. Grading was based in gamification, students accumulated points according to tasks they completed. We gave particular importance to forum discussion, which was an evidence-based clinical scenario discussion.

**Results:**

So far, 2 editions of the course were completed (2012 and 2013). Overall, 40 people enrolled, 21 in 2012 and 19 in 2013, most of them residents (31) from all over the country. 60% of them finished the course and were approved (drop-out rate was around 35%). Website use varied a lot over the time and some topics were very popular as staging and treatment or early lung cancer. Most students said they spent 3 to 4 hours per week on course activities. The study hours were evenly distributed over the day but predominated on Sunday, Monday and Tuesday. Student satisfaction with the model was high, all those who answered the end-of-course survey rated it as good or excellent.

**Conclusion:**

This preliminary analysis showed that the online learning model is feasible even when using free online tools. Despite the high drop-out rate, we were able to provide education to students from all over the country and their satisfaction rate was high.

**Disclosure:** No significant relationships.





V-094

**ROBOTIC-ASSISTED RESECTION OF ESOPHAGEAL LEIOMYOMA IN PRONE POSITION**

José Ribas Milanez De Campos<sup>1</sup>, H.V.S. Fonseca<sup>1</sup>, L.V.N. Melo<sup>1</sup>, E.C. Werebe<sup>2</sup>,  
A.L.V. Macedo<sup>2</sup>

<sup>1</sup>*Thoracic Surgery Division, Heart Institute (InCor) do Hospital das Clínicas da FMUSP, São Paulo, Brazil*

<sup>2</sup>*Thoracic Surgery Division, Hospital Israelita Albert Einstein, São Paulo, Brazil*

**Objectives:**

Esophageal leiomyoma is a rare benign esophageal tumor, which rises from the muscularis propria layer. Growth may be intraluminal, extraluminal, or a combination of them, and surgery is indicated in all symptomatic cases. It corresponds for less than 1% of all esophageal masses, but is the most common benign esophageal tumor. The aim of this video demonstration is to expose the feasibility of a robotic resection of this lesion.

**Video description:**

Forty-nine years old woman, heavy smoker, with progressive dysphagia in last five months. Endoscopy revealed extrinsic compression in median esophagus. CT scan identified a paraesophageal, subcarinal mass and endoscopic ultrasound biopsy confirmed leiomyoma. Patient with double-lumen tube, prone position and three port access in right hemithorax. After mediastinal pleura opening and azygos vein clipping, dissection of esophageal longitudinal and circular muscle layers were realized. The tumor was identified and its enucleation was performed without damage of esophageal mucosa. Suture of muscle layers and right pleural drainage as usual. The procedure was performed with no perioperative complication and minimal postoperative pain, with no postoperative morbidity. Chest X Ray and contrast esophagogram showed well expanded lungs and no luminal leaks.

**Conclusions:**

Robotic approach for esophageal leiomyomas is feasible and effective, besides being considered a minimally-invasive option. A high-degree satisfaction can be achieved.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

**TUESDAY, 2 JUNE 2015****11:00 - 12:30****SESSION X: MIXED THORACIC II****F-097****ARE CARDIAC AUTONOMIC CHANGES AFTER THORACIC SYMPATHECTOMY FOR ESSENTIAL PALMAR HYPERHIDROSIS CORRELATED WITH THE EXTENT OF THE RESECTION?**

Alfonso Fiorelli<sup>1</sup>, G. Messina<sup>2</sup>, A.C. Izzo<sup>1</sup>, S. Costanzo<sup>1</sup>, R. Milione<sup>1</sup>, A. Viggiano<sup>2</sup>, M. Monda<sup>2</sup>, G. Vicidomini<sup>1</sup>, M. Santini<sup>1</sup>

<sup>1</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

<sup>2</sup>*Human Physiology and Clinical Dietetic Service, Second University of Naples, Naples, Italy*

**Objectives:**

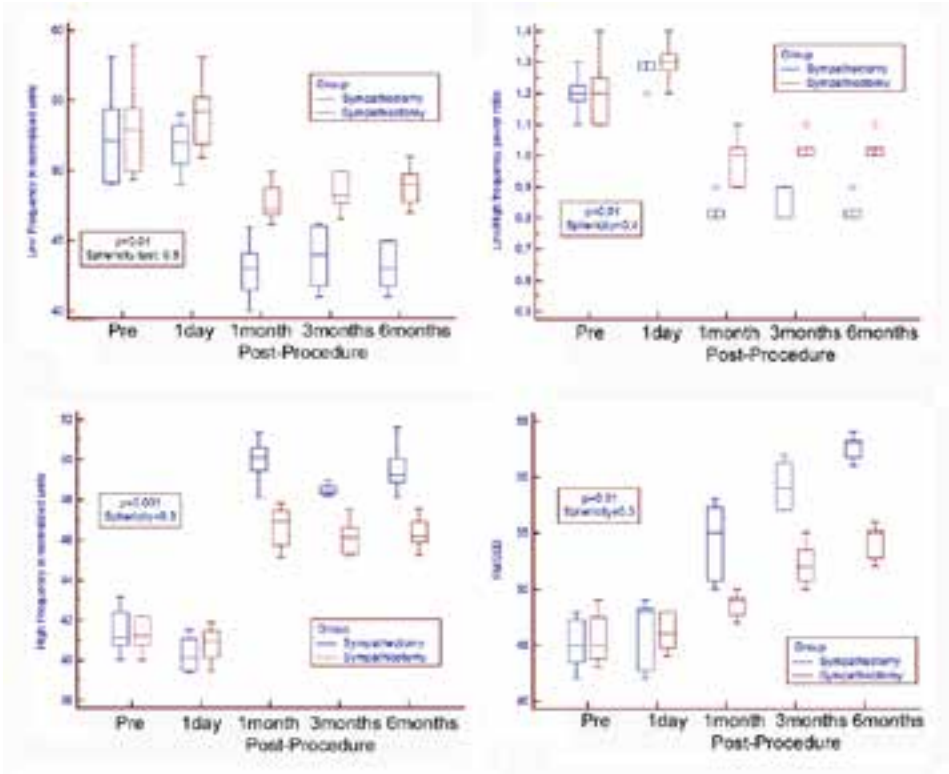
Cardiac autonomic changes after endoscopic thoracic sympathectomy (ETS) for essential palmar hyperhidrosis (EPH) are well-known. We aimed to determinate if they are correlated with the extent of sympathetic denervation, an issue not been evaluated before.

**Methods:**

60 patients undergoing ETS for EPH were randomized in Sympathectomy Group (n=30) if the T3 ganglia was excised and Sympathicotomy Group if the sympathetic chain was separated near the upper border of the third rib without T3 ganglia excision. Cardiac autonomous activity was evaluated with a 24-Holter recording 7 day before operation and 1 day, 1, 3 and 6 months following surgery. The pre- and postoperative data were statistically compared using ANOVA test.

**Results:**

27 cases in Sympathicotomy and 26 patients in Sympathectomy Group completed the study. The low frequency (LF) power in normalized units (expression of sympathetic activity) was significantly reduced in Sympathicotomy (from  $52.8 \pm 3.7$  to  $48.8 \pm 1.5$ ;  $p=0.01$ ) and in Sympathectomy Group (from  $52.3 \pm 3.9$  to  $43.2 \pm 1.7$ ). Conversely, the high frequency (HF) power in normalized units (expression of vagal activity) was significantly increased in Sympathicotomy (from  $41.3 \pm 0.9$  to  $46.5 \pm 0.8$ ;  $p<0.001$ ) and in Sympathectomy Groups (from  $41.4 \pm 1.1$  to  $49 \pm 1.2$ ;  $p<0.001$ ) after EST. Also the root mean square of the successive differences of heart period (RMSSD) was significantly increased in Sympathicotomy (from  $45.6 \pm 5.8$  to  $54.2 \pm 1.6$ ;  $p<0.01$ ) and in Sympathectomy Groups (from  $45.2 \pm 2.3$  to  $62.6 \pm 1.1$ ;  $p<0.01$ ). The relative decrease of sympathetic activity and the increase of vagal activity was ulteriorly showed by the significant decrease of LF/HF ratio in both groups. The changes of LF, HF, LF/HF, and RMSSD were more evident in Sympathectomy than in Sympathicotomy Group demonstrating that they were correlated with the extend of denervation (Figure 1).



**Conclusion:**

ETS may result in sub-clinical changes of cardiac autonomic activity with decrease of sympathetic activity and increase of vagal activity. Such changes seem to be correlated with the extension of denervation.

**Disclosure:** No significant relationships.

Tuesday A.M.  
Abstracts 071 - 105

**F-098****IMPACT OF COMBINED PULMONARY FIBROSIS AND EMPHYSEMA ON SURGICAL COMPLICATIONS AND LONG-TERM SURVIVAL OF PATIENTS UNDERGOING SURGERY FOR NON-SMALL CELL LUNG CANCER**

Atsushi Hata<sup>1</sup>, Y. Sekine<sup>1</sup>, E. Koh<sup>1</sup>, I. Yoshino<sup>2</sup>

<sup>1</sup>*Department of Thoracic Surgery, Tokyo Women's Medical University Yachiyo Medical Center, Yachiyo, Japan*

<sup>2</sup>*Department of Thoracic Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan*

**Objectives:**

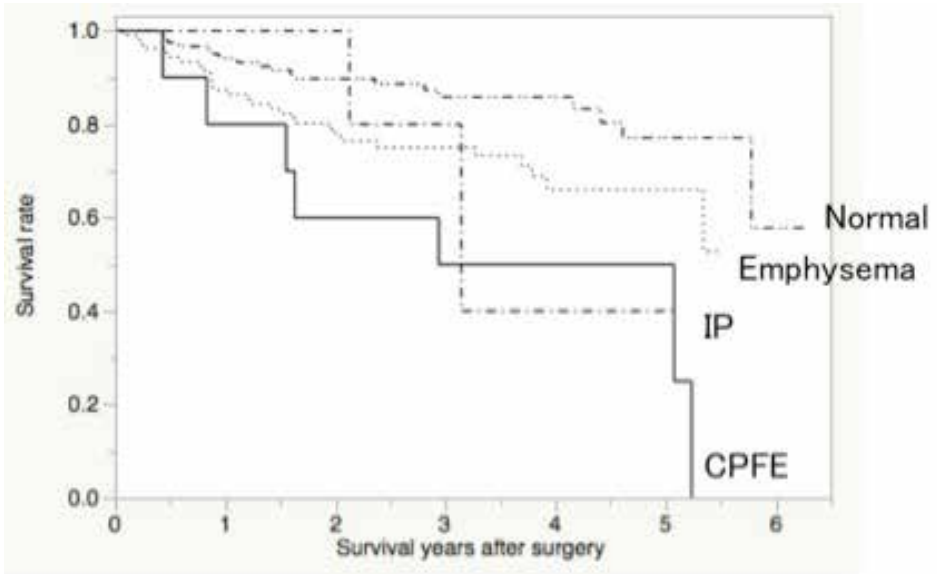
This study aimed to investigate post operative morbidity and mortality, and the long-term survival for patients with lung cancer who have combined pulmonary fibrosis and emphysema (CPFE).

**Methods:**

A retrospective chart review of 250 patients with lung cancer who underwent pulmonary resection at Tokyo Women's Medical University Yachiyo Medical Center between 2008 and 2012 was undertaken. The patients were divided into four groups: Normal group, Emphysema group, interstitial pneumonia (IP) group, and CPFE group. The four groups were compared and long-term overall survivals were analyzed. The definition of emphysema, IP and CPFE were low attenuation area (LAA) above 1 point at Goddard classification score without interstitial shadow, interstitial shadow without emphysema and the combination of LAA above 1 point at Goddard classification score in the upper field and basal pulmonary fibrosis on computed tomography, respectively.

**Results:**

The numbers of the normal, Emphysema, IP and CPFE groups were, 124 (49.6%), 108 (43.2%), 7 (2.8%) and 11 patients (4.4%), respectively. The 5 year overall survivals were 77.1% in Normal group, 66.1% in Emphysema group, 40% in IP group, 25% in CPFE group. ( $p=0.0016$ ) In the subset analysis focused on cancer stage I, the 5 year overall survival of CPFE group ( $n=8$ , 20.8%) was lower than that of Emphysema group (71, 81.2%) ( $p<0.0001$ ). The frequency of death because of respiratory failure was significantly different among four groups ( $p=0.0005$ ) and CPFE was more likely to be died by respiratory failure. In CPFE group, three of seven patients (42.9%) died with acute excavation of IP or severe pneumonia.



**Conclusion:**

CPFEE have poorer prognosis than Emphysema alone or normal lung patients. The preoperative intensive evaluation of CT was important and cancer therapy such as operation method should be decided carefully in CPFEE because of the risk of respiratory failure.

**Disclosure:** No significant relationships.

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## F-099

**REDUCED RISK OF POSTOPERATIVE ACUTE EXACERBATION IN PATIENTS WITH LUNG CANCER HARBORING IDIOPATHIC PULMONARY FIBROSIS WHO UNDERWENT PERIOPERATIVE PIRFENIDONE TREATMENT**

Takekazu Iwata, K. Nagato, T. Nakajima, H. Suzuki, S. Yoshida, I. Yoshino

*Department of General Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan*

**Objectives:**

Acute exacerbation of idiopathic pulmonary fibrosis (AE-IPF) is a life-threatening complication of lung cancer surgery for patients with IPF, and no effective prophylaxis for AE-IPF has ever been reported. Japanese large cohort study revealed seven risk factors for AE-IPF after lung cancer surgery (history of AE, surgical procedure, UIP, male, steroid, elevated KL-6, low vital capacity), and a risk scoring system has recently been advocated (Gen Thorac Cardiovasc Surg, 2014). A recent Japanese multi-institutional prospective trial (WJOG6711L) showed an encouraging result of perioperative pirfenidone treatment (PPT) for prevention of AE-IPF, however, it was a single-arm trial and background risk evaluation using the scoring system was not yet performed. In this study, we evaluate the risk scores and incidence of AE-IPF in our consecutive series of lung cancer patients with IPF who underwent surgery with or without PPT.

**Methods:**

Thirty-one PPT cases and 19 historical controls were retrospectively investigated for their clinical characteristics including risk scores and incidences of AE-IPF after surgery.

**Results:**

Between the PPT and control groups, there were no difference of age ( $68\pm 2$  vs.  $69\pm 2$  years), pack year ( $62\pm 6$  vs.  $48\pm 8$ ), gender (28 male/3 female vs. 18/1), vital capacity ( $95\pm 3$  vs.  $103\pm 4\%$  predicted), KL-6 ( $900\pm 136$  vs.  $676\pm 184$  U/ml), procedure (23 anatomical resection/8 wedge resection vs. 18/1), or risk score ( $10.5\pm 0.4$  vs.  $11.2\pm 0.5$ ). The incidences of AE-IPF for the PPT/control groups were 0.0/10.5% during 30 postoperative days ( $p=0.07$ ), and 21.1/3.2% during 90 postoperative days ( $p=0.04$ ).

**Conclusion:**

Prophylactic effect of PPT for postoperative AE-IPF was strongly suggested. Since 11 point of risk score was reported to predict 10.7% of AE-IPF occurrence within 30 postoperative days, our results for the control group clearly validate the scoring system.

**Disclosure:** I. Yoshino: I received a research grant from Shionogi & Co. Ltd for the other purpose than this study.

F-100

**TWO-STAGED SURGERY WITHOUT ANY LUNG RESECTION FOR ENDOBRONCHIAL CARCINOID TUMOUR**

Oleg Pikin<sup>1</sup>, A. Traktenberg<sup>1</sup>, A. Ryabov<sup>2</sup>, V. Sokolov<sup>3</sup>, A. Amiraliev<sup>1</sup>, V. Glushko<sup>1</sup>, K. Kolbanov<sup>1</sup>, L. Telegina<sup>3</sup>, V. Barmin<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Moscow Hertzen Research Institute of Oncology, Moscow, Russian Federation*

<sup>2</sup>*Thoraco-Abdominal Surgery, Moscow Hertzen Research Institute of Oncology, Moscow, Russian Federation*

<sup>3</sup>*Endoscopy, Moscow Hertzen Research Institute of Oncology, Moscow, Russian Federation*

**Objectives:**

The aim of the study is to evaluate the efficacy of combined approach (endoscopic resection followed by pure bronchoplasty without any pulmonary resection) in patients with endobronchial carcinoids.

**Methods:**

We applied two-staged technique (endoscopic resection first followed by pure bronchoplasty) to 25 patients (males – 10) with endobronchial carcinoid. The median age was 32,4 years with a range from 19 to 64 years. The indications to this technique were pure endobronchial carcinoid without lymph node involvement. Tumour was located on the right side in 18 (72%), on the left – in 7(28%) patients. Endoscopic resection/desobliteration of central airway was performed to all patients as the first stage procedure to resolve the obstructive pneumonia and to localize the pedicle of the tumour for proper planning of further bronchoplasty followed by endobronchial ultrasound to detect the peribronchial component. Different types of pure bronchoplasty were performed as the second stage surgery with systematic mediastinal lymph node dissection (table 1).

Type of resection	Right side	Left side
Main stem bronchus Bronchus intermedius Main stem bronchus+upper lobe bronchus Bronchus intermedius+middle lobe bronchus Bronchus intemedius+lower lobe bronchus	7 7 2 1 2	5 - 2 - -
<b>Total</b>	18	7

**Results:**

The resection was complete (R0) in all cases. No lymph node metastases were observed, and tumours were pathologically staged as pT1aN0 in 18, pT2N0 – in 5, pT3N0 – in 2 patients and that all cases had invasive components limited to the bronchial wall. Twenty three tumours were typical and only two - atypical carcinoids. Morbidity was 33,3% (only minor complications) with no mortality. The stenosis of bronchial anastomosis during follow-up was observed in one patient treated by endoscopic intervention. Overall 5- and 10-years survival was 100,0% and 96,0% (one patient died from myocardial infarction 8 years after surgery). No recurrence of the primary tumour was observed in any case.

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**Conclusion:**

Two-staged surgery (endoscopic resection+pure bronchoplasty without lung parenchyma resection) is an effective technique for treatment of endobronchial carcinoids with excellent oncologic outcome.

**Disclosure:** No significant relationships.





F-101

**NEGATIVE PLEURAL BIOPSIES FOR SUSPECTED PLEURAL MALIGNANCY – TO TRUST OR NOT TO TRUST?**Mohammed Shafaat<sup>1</sup>, S. Nicholson<sup>2</sup>, E. Fontaine<sup>1</sup>, H. Doran<sup>2</sup>, K.S. Rammohan<sup>1</sup><sup>1</sup>*Cardiothoracic Surgery, UHSM, Manchester, United Kingdom*<sup>2</sup>*Department of Histopathology, UHSM, Manchester, United Kingdom***Objectives:**

We are a tertiary referral teaching hospital. We evaluated our sensitivity and false negative rates in diagnosing pleural malignancy. The aim was to assess the reliability of a negative surgical biopsy for cases of suspected pleural malignancy.

**Methods:**

A retrospective study was performed utilising hospital databases for two periods - August 2005 to July 2006 and July 2011 to August 2012. Two year follow-up was established by case note review, general practitioner questionnaires and mortality data from the UK's Office for National Statistics.

**Results:**

We performed 1347 thoracic procedures between 2011 and 2012, which included 135 pleural biopsies for suspected malignancy. Malignant diagnosis was made in 63 patients, a negative (benign/suspicious) biopsy was made in 72 cases. In the negative group 12 patients subsequently were diagnosed with mesothelioma – pleural biopsy sensitivity 84% and a false negative rate 16%. In 2005 to 2006, 60 of the 157 biopsies were negative. Eight patients were subsequently diagnosed with mesothelioma - sensitivity 92% and a false negative rate 8%.

	Aug 05–Jul 06	Jul 11- Aug 12
<b>Number Surgical Biopsies</b>	157	135
<b>Malignant Diagnosis Mesothelioma Other Malignancy</b>	97 44 53	63 34 29
<b>Benign / suspicious for malignancy (negative)</b>	60	72
<b>Deaths Negative Biopsy</b>	17/60	33/72
<b>Mesothelioma Diagnosed after Negative Biopsy</b>	8	12
<b>Lost to follow up</b>	7	15
<b>Sensitivity</b>	92%	84%
<b>Specificity</b>	100%	100%
<b>False negative rate</b>	8%	16%

**Conclusion:**

In spite of access to a very experienced histopathology service, utilizing the latest cytogenetic techniques (Fluorescent in Situ Hybridization), pleural biopsies carried a false negative rate of 8%-16% in our institution. This highlights the need for a robust follow up and a low threshold for repeat biopsy in patients with a high clinical suspicion of mesothelioma and a history of occupational exposure. This has now become our guiding policy at our multi-disciplinary meetings.

**Disclosure:** No significant relationships.



F-102

**VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR PRIMARY SPONTANEOUS PNEUMOTHORAX TREATMENT: PLEURECTOMY OR PLEURAL ABRASION? IS WEDGE RESECTION ALWAYS NECESSARY?**

Mustafa Vayvada<sup>1</sup>, V. Baysungur<sup>1</sup>, M. Demir<sup>1</sup>, S. Bayram<sup>1</sup>, E. Cesur<sup>1</sup>, I. Ocakcioglu<sup>2</sup>, L. Alpay<sup>1</sup>, S. Metin<sup>1</sup>, C. Atinkaya Ozturk<sup>1</sup>, C. Tezel<sup>1</sup>, I. Yalcinkaya<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Sureyyapasa Chest Disease and Thoracic Surgery Training and Research Hospital, Istanbul, Turkey*

<sup>2</sup>*Thoracic Surgery, Van Education and Research Hospital, Van, Turkey*

**Objectives:**

Video assisted thoracoscopic surgery has become the gold standard for surgical treatment of spontaneous pneumothorax. Despite, timing and approach of surgical procedure is controversial.

**Methods:**

285 patients that had undergone VATS for PSP diagnosis between years 2007 and 2012 were included in this study. 3 of the patients who had undergone video thoracoscopy had postoperative bleeding that required thoracotomy. These patients were excluded from the study and results of 282 patients were evaluated. Data of age, gender, operation indication, pleurodesis technique, whether wedge resection was applied or not, appearance of bullae or blebs during thoracoscopy, pathology reports, drain removal time, length of hospital stay, operation duration, follow-up duration and presence of complications were recorded. Minimum follow-up time was 24 months (Average: 53,7 months).

**Results:**

In our study, 3 operation techniques were evaluated (wedge resection + pleural abrasion / wedge resection + pleurectomy / isolated pleurectomy). No statistically significant differences was observed between three techniques for drain removal time, length of hospital stay, drainage amount, relapse, prolonged air leak, and presence of bleeding. Prolonged air leak of the patients who had not underwent wedge resection was longer than patients who had underwent wedge resection, this difference was statistically significant. But there wasn't statistical difference in the rate of recurrence.

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Comparison of  
operative tech-  
niques

	Operative techniques			<sup>1</sup> p
	Wedge resection + Pleural abrasion n=86	Wedge resection + Pleurectomy n=117	Isoleted pleurectomy n=79	
	Mean ± SD (median)	Mean ± SD (median)	Mean ± SD (median)	
<b>Duration of the operation (min)</b>	83,93±9,22 (85)	93,44±11,26 (90)	82,56±10,67 (86,5)	<b>0,001**</b>
<b>Removal time of drain (days)</b>	3,7±1,87 (3)	3,51±1,67 (3)	3,98±2,59 (4)	<b>0,82</b>
<b>Hospital Length of Stay (days)</b>	4,15±1,79 (4)	3,89±1,58 (4)	3,99±1,72 (4)	<b>0,69</b>
<b>Drainage Volume (ml)</b>	160,34±111,58 (100)	160,59±119,09 (100)	153,13±97,22 (100)	<b>0,96</b>
n = 282	n (%)	n (%)	n (%)	<b>2p</b>
<b>Recurrence</b>	<b>5 (%5,8)</b>	<b>7 (%5,9)</b>	<b>3 (%3,8)</b>	<b>0,78</b>
<b>Prolonged air leak</b>	2 (%2,3)	2 (%1,7)	6 (%7,5)	<b>0,71</b>
n=285	n=87	n=118	n=80	
<b>Thoracotomy requiring bleeding</b>	1 (%1,14)	1 (%0,8)	1 (%1,25)	<b>0,96</b>

### Conclusion:

In the video-assisted thoracoscopic surgery of PSP, lungs should be inflated and especially apex and lower lobe superior segment should be inspected. Blindly admitted wedge resection without determining the bullae or blebs presence had no contribution to decline in the relapses. No difference was observed between pleurectomy and pleural abrasion for pneumothorax relapse and postoperative bleeding. Pleural abrasion may be chosen as a less invasive procedure since further lung surgery might be required in following years.

**Disclosure:** No significant relationships.



F-103

**PRIORITY OF LYMPH NODE DISSECTION AND SURGICAL APPROACH FOR SIEWERT TYPE II ADENOCARCINOMA OF THE ESOPHAGOGASTRIC JUNCTION: A SINGLE CENTER RETROSPECTIVE COHORT STUDY**

Wen-Ping Wang, Jun Peng, J. Cai, L. Chen

*Department of Thoracic Surgery, West China Hospital of Sichuan University, Chengdu, China*

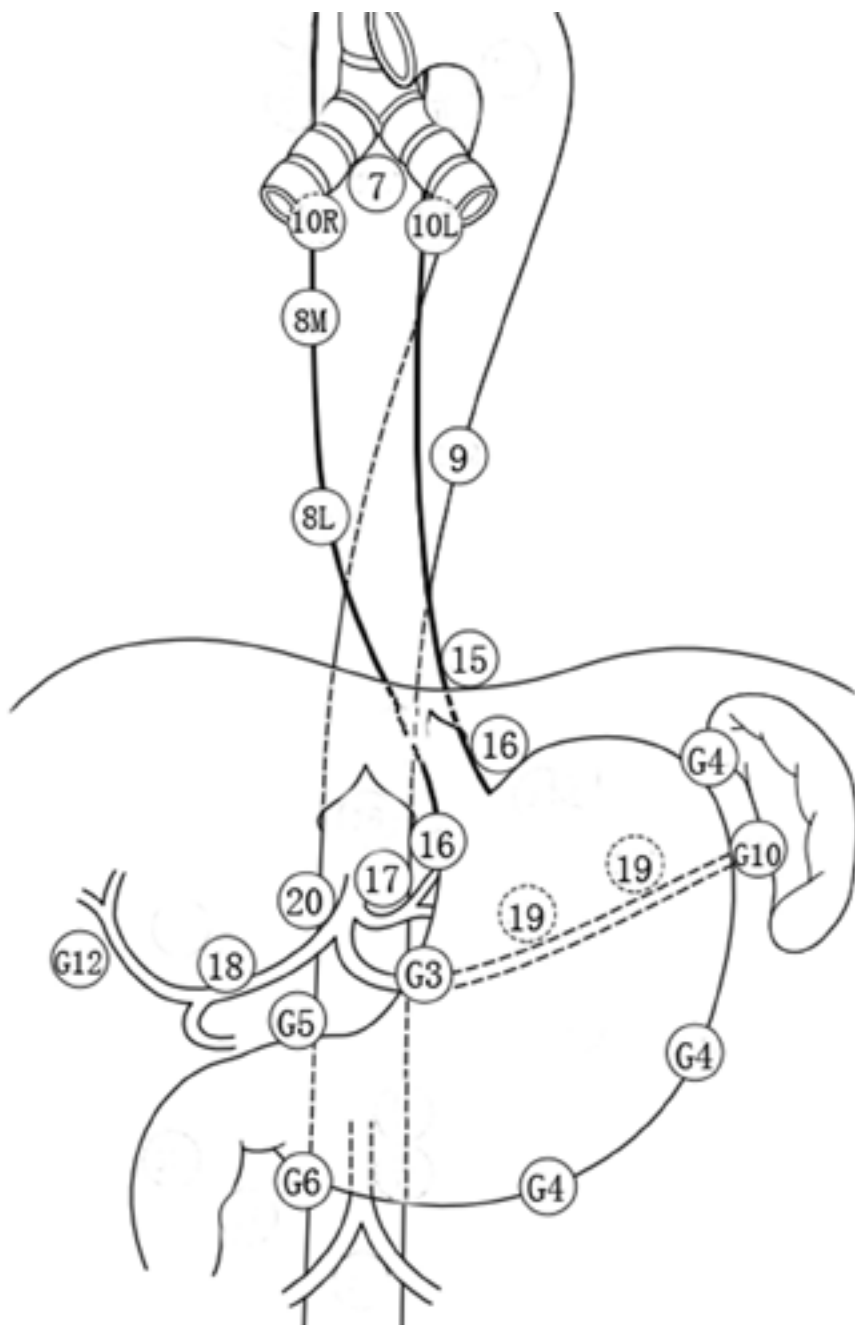
**Objectives:**

The aim of this study was to compare the clinicopathological characteristics of patients with Siewert type II AEG who underwent surgery in three different approaches, to identify the optimal extent of thoracic and abdominal lymph node dissection and its surgical approach.

**Methods:**

The clinicopathological data of 192 patients with Siewert II AEG who were admitted to our center during January 2007 through October 2011 and underwent different surgical procedures were retrospectively analyzed. The extent of dissection and metastatic frequency of each lymph node station were reviewed. We used the index of estimated benefit from lymph node dissection to assess the therapeutic value of lymph node dissection of each station.

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**Results:**

Overall, for the thoracic lymph node dissection, the left thoracic route (LT) and Ivor-Lewis procedure (IL) are better choices than the abdomino-transhital route (AT). While for the abdominal lymph node dissection, the AT achieved a better dissection extent. No significant difference was found in meta-static frequency for each station except the 16<sup>th</sup> station. The 5-year overall survival rate was 46%. The multivariate analysis found only N stage ( $P=0.000$ , HR=1.67, 95%CI: 1.31-2.14) and the number of resected lymph nodes  $\geq 12$  ( $P=0.035$ , HR=0.58, 95%CI: 0.34-0.96) were prognostic factors for Siewert type II AEG. Furthermore, we identified 2 thoracic lymph node stations (8M and 8L) and 6 abdominal lymph node stations (16, 17, 19, 20, G3, G4) have a high therapeutic value for the patients.

Estimated benefit from lymph node dissection in each station

Lymph node station	Number of patients with metastatic nodes	Number of patients with dissected nodes	Incidence of metastasis (%)	Overall 5-year survival rate (%)	IEBLD
7	4	58	6.9	25	1.7
8M	8	47	17.0	57	9.7
8L	11	64	17.2	31	5.3
9	2	67	3.0	100	3
10	1	37	2.7	100	2.7
15	2	15	13.3	0	0
16	84	140	60.0	30	18
17	72	150	48.0	25	12
18	5	39	12.8	33	4.2
19	6	30	20	33	6.6
20	10	37	27.0	57	15.4
G3	68	117	58.1	40	23.3
G4	22	72	30.6	19	5.8
G5	2	13	15.4	0	0
G6	3	24	12.5	0	0
G10	1	12	8.3	0	0
G12	2	24	8.3	0	0

**Conclusion:**

We recommend the 8M, 8L, 16, 17, and G3 should be excised for Siewert type II AEG. Although we didn't find any survival difference among the three surgical approaches, considering the lymphadenectomy, we may recommend the Ivor-Lewis procedure as the optimal choice for patients with Siewert type II AEG. However, it should be conducted by thoracic surgeon who is familiar with abdominal lymph node anatomy.

**Disclosure:** No significant relationships.

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## F-104

**RESECTION OF THYMIC CARCINOMA AND CARCINOID SHOULD INCLUDE NODAL SAMPLING**

Benny Weksler, J. Sullivan

*Surgery, University of Tennessee Health Science Center, Memphis, United States of America***Objectives:**

Thymic carcinoma and carcinoids are rare neoplasms best treated by surgical resection; however, there are no clear guidelines on the need for lymph node sampling at the time of surgical resection. Additionally, the prognostic implication of nodal metastases is unclear. The aim of this study was to analyze the incidence and prognostic implication of nodal metastases in thymic carcinoma and carcinoid.

**Methods:**

The Surveillance, Epidemiology and End Results (SEER) database was queried for all patients who underwent surgical resection of thymic carcinoma or carcinoid from 1988 to 2011, survived more than 30 days, and had documented nodal sampling. We compared continuous variables using the Student's t-test and categorical variables using the Chi-square test. Survival was determined by the Kaplan-Meier method and compared using the log-rank test. A Cox proportional hazard model was used to identify relevant survival variables.

**Results:**

We identified 150 eligible patients, 99 thymic carcinoma and 51 carcinoid. A median of 2 nodes were sampled per patient. Fifty-nine patients (59/150, 39.3%) had at least one positive node; Nodal metastases were more common in patients with thymic carcinoid (34/51, 66.7% vs 27/99, 27.3%,  $p < 0.001$ ). Median survival in node-negative patients was 120 months compared with 55 months in node-positive patients ( $p < 0.001$ ). The presence of positive nodes upstaged 46/56 (82.1%) of patients from lower Masaoka stages to Masaoka stage IV. In multivariate analysis, the presence of positive nodes was the only significant variable with independent adverse impact on survival (Table 1).

Table 1. Cox regression analysis

Variable	HR	95%CI	p
Age at diagnosis	1.003	0.981-1.025	0.824
Tumor size	1.001	0.993-1.009	0.791
Postoperative radiation	0.893	0.473-1.684	0.726
Masaoka stage (prior to upstage)	1.074	0.766-1.507	0.678
Sex (male vs female)	1.487	0.767-2.883	0.240
Race (Caucasian vs other)	1.729	0.706-4.238	0.231
Histology (Carcinoma vs carcinoid)	2.077	0.978-4.411	0.057
Positive nodes	5.090	2.347-11.041	<0.001





**Conclusion:**

Nodal status appears to be an important prognostic factor in patients with thymic carcinoma and carcinoid. Until the prognostic significance of nodal metastases is better studied, surgical therapy for thymic carcinoma and carcinoid should include sampling of regional lymph nodes.

**Disclosure:** No significant relationships.

## F-105

**ENHANCED RECOVERY AFTER THORACIC SURGERY: OUTCOMES FOLLOWING IMPLEMENTATION OF A TAILORED ERAS PATHWAY IN A TERTIARY CENTRE**

Roxanna Zakeri, J. Rao, J. Edwards, L. Socci

*Cardiothoracic Surgery, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom*

**Objectives:**

Minimally-invasive video-assisted thoracoscopic surgery (VATS) and evolution of pulmonary rehabilitation services have enabled ERAS principles to be applied to thoracic surgery, aiming to reduce postoperative recovery time and complications. We present our tailored, multidisciplinary ERAS protocol and results for patients undergoing lung resection in a large, tertiary-level centre.

**Methods:**

Retrospective case-note analysis of 60 consecutive anatomical lung resections performed before and after implementation of our ERAS protocol (30 patients in each cohort) during the periods March–May 2014 and July–August 2014. A total of 32 key variables were analysed in 3 groups: preoperative optimisation (e.g. smoking cessation, carbohydrate loading, benzodiazepine avoidance), intraoperative factors (minimally-invasive technique, regional anaesthesia), postoperative outcomes (analgesia, complications, readmission).

**Results:**

No significant difference in median age, surgical indication or staging was found between the cohorts. Compliance with ERAS preoperative measures was strong; in particular, the use of benzodiazepine sedation fell significantly (36.7% to 3.3%,  $p=0.001$ ). Patients admitted on the day of surgery rose (6.7% to 73.3%,  $p<0.001$ ). Minimally-invasive surgery has doubled to 53.3%, and we have moved completely from epidural to regional anaesthesia with paravertebral and intercostal blocks (23.3% to 86.7%,  $p<0.001$ ). Postoperative chest infection rates almost halved (30% to 16.7%), as did cardiovascular complications (AF/DVT/PE) (13.3% to 6.7%) whilst constipation rate fell from 36.7% to 10% ( $p=0.014$ ). Readmission to level-3 care was markedly reduced (10% to 0%). Median length of stay (LOS) with ERAS was 5 days, lower than the historical departmental LOS of 8 days. Notably, a reduction of LOS by 1 day was found following pneumonectomy (6 to 5 days).

**Conclusion:**

Our results demonstrate that ERAS principles can be applied to thoracic surgery patients with great success. Most common and major postoperative complications have been reduced with a resulting decrease in postoperative length of stay.

**Disclosure:** No significant relationships.



**TUESDAY, 2 JUNE 2015**

**13:00 - 14:00**

**SESSION XI: VIDEOS II**

**V-106**

**MADDAUS TECHNIQUE WITH LARYNGEAL DESCENT TO RESECT A SUBGLOTTIC HIGH TRACHEAL STENOSIS**

*Enrique Bermejo, R. Arrabal, R. Mongil, C. Pages, A. Benitez  
Thoracic Surgery, Hospital Carlos Haya, Malaga, Spain*

**Objectives:**

To use a video to explain the surgical technique to resect an idiopathic subglottic high tracheal stenosis that required laryngofissure and laryngeal descent.

**Method:** Maddaus surgery with laryngeal descent

**Video description:**

A 70-year-old female patient with idiopathic tracheal stenosis measuring 1 cm in length half a centimeter from the vocal chords. Applying the Brichet protocol, the patient was treated with laser and dilatation on three occasions since the disorder was diagnosed in 2011. After the last laser session, in November 2013, stenotic relapse occurred within one month (subglottic lumen of 5 mm). Surgery, which was uneventful, consisted of subglottic tracheal resection with laryngofissure and laryngeal descent to avoid anastomotic tension. The procedure included the placement of a Montgomery T tube for three weeks, as is necessary in these cases, as an anastomotic tutor. All the postoperative care required with these T tubes was given to avoid plugging and asphyxia: high-flow humidifier at 37° C, daily cleansing bronchoscopy and frequent aspirations.

**Conclusions:**

Subglottic high tracheal resection is a complex procedure that requires a lengthy and continuous learning process. Postoperative care is vital for the success of the procedure.

**Disclosure:** No significant relationships.

V-107

**MANAGEMENT OF CATASTROPHIC TRACHEOSTOMY WITH ESOPHAGEAL PERFORATION AND SUBTOTAL TRACHEAL SECTION**Francesco Paolo Caronia<sup>1</sup>, A. Fiorelli<sup>2</sup><sup>1</sup>*Thoracic Surgery, Mediterranean Oncologic Institut, Catania, Italy*<sup>2</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy***Objectives:**

Literature reported several informations about catastrophic complication during and following tracheostomy. We present a case of tracheostomy complicated with an esophageal perforation and a section of more than 270° of the tracheal circumference.

**Video description:**

A 61 years old female has been scheduled for left arthroscopic scapular surgery in another institution. Anesthesiologists dealt with unexpected difficult intubation with cardiac arrest. The patient underwent urgent tracheostomy, cardiopulmonary resuscitation and was transferred to the ICU. Five day later the patient developed fever and was referred to our institution. The patient presented pus discharge from the tracheostomy and a CT scan of the neck and chest showed signs of cervico-mediastinal collection and an almost complete tracheal wall section. After an urgent multidisciplinary meeting we decided to operate on the patient. She underwent tracheal and esophageal repair with separted 3-0 stitches, thoracotomy and mediastinal drainage. A chest drain was positioned. Two cervical 16 Fr drain on suction were positioned in both lateral tracheal side and one 24 Fr drain was positioned near the repaired esophageal perforation. In post-operative day number 12 she developed an anterior tracheal fistula and she underwent a second operation. The necrotic tracheal tissue was removed and the defect was sutured with separate absorbable 3-0 stitches. Then we positioned a digastric and a sternocleidomastoid muscle flaps to cover the new tracheal suture. The patient was extubated in the operating room and transferred to the recovery room. The patient had a successful surgical outcome and at the 12 months follow-up a fiberoptic bronchoscopy showed a patent tracheal lumen and a good cosmetic result.

**Conclusions:**

Our presentation indicates that catastrophic complication during and following tracheostomy are always possible and a prompt diagnosis and reconstructive surgery improve patient prognosis.

**Disclosure:** No significant relationships.



V-108

**VALIDATION OF USEFULNESS AND PITFALL OF NEW TECHNIQUE FOR IDENTIFYING INTERSEGMENTAL PLANE USING INDOCYANINE GREEN INJECTION IN RIGHT S2 SEGMENTECTOMY BY VATS**

Masahiko Harada, T. Murayama, H. Horio

*Department of Thoracic Surgery, Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital, Tokyo, Japan*

**Objectives:**

The method used to detect the intersegmental plane remains controversial. Recently, new technique for identifying intersegmental plane using Indocyanine Green (ICG) injection in lung segmentectomy has been introduced (Oh et al. Ann Thorac surg 2013,95,2188-90). We evaluated the usefulness and pitfall of this technique.

**Video description:**

A 67-year-old female, bilateral multiple lung cancer, c-T2a(3)N0M0 stage IB, was suspected in a mass survey. After undergoing left upper lobectomy, right S2 segmentectomy for the nodule located in a right S2a, 18mm in size and showed mixed GGO on HRCT (C/T=0.4) was performed. With an open approach through a 6cm thoracotomy with video-assist, we isolate the pulmonary vein (V2a, V2b, V2c), pulmonary artery (asc. A2b, rec.A2a), and bronchus (B2) from the inter lobe and the hilum. After cutting the pulmonary artery (asc. A2b, rec.A2a) and vein (V2a, V2b), we ligate the segmental bronchus (B2) and put the stay suture. ICG (25mg dissolved in 50 mL saline) was slowly infused into the distal peripheral bronchus (B2a and B2b) using the infusion intravenous cannula. We use an electrocautery setting of 100 to divide the intersegmental plane.

After ICG injection, the lung S2 segment turns green, the border of the intersegmental plane was easily recognized. Operation time, bleeding, drain removal and discharge were 4h4min, 30g, 7POD and 10POD, respectively. Pathology showed rt.S2a 15mm Ad. mixed subtype G1 PL0 Es1(-) D0 PM0 Ly0 V0 surgical margin 12mm (-).

**Conclusions:**

Although easy identification of intersegmental planes by a change of color not only of the surface but also of the parenchyma of the lung could be done, super selective stain of sub segment (e.g. stained S2a or S2b alone) and overflow from the orifice or over spread through the Kohn pores due to rapid ICG injection may be the problem.

**Disclosure:** No significant relationships.

**V-109****SURGICAL TREATMENT OF PULMONARY ARTERY SARCOMA**

Chang Hyun Kang, S. Park, Y. Hwang, H.J. Lee, I.K. Park, Y.T. Kim

*Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea*

**Objectives:**

Pulmonary artery sarcoma is a rare disease which involves proximal pulmonary arteries. Although surgical resection is a standard treatment, cardiopulmonary bypass is frequently required for complete removal of the tumor. Here we present a video case with pulmonary artery sarcoma at the proximal part of right pulmonary artery.

**Video description:**

The patient was a 52-year old woman who complained of cough and hemoptysis. Chest CT scan, MRI, and PET-CT scan were performed and pulmonary artery sarcoma was diagnosed. Surgical resection was performed through median sternotomy by support of cardiopulmonary bypass. The tumor was removed with en bloc fashion by right pneumonectomy and combined main pulmonary artery resection. Main pulmonary artery was reconstructed with Hemashield vascular graft. R0 resection was achieved and the patient was discharged 1 week after operation without any complication.

**Conclusions:**

Pulmonary artery sarcoma could be completely and safely resected by support of cardiopulmonary bypass.

**Disclosure:** No significant relationships.



V-110

**EXTREME FAST-TRACK REHABILITATION IN THORACIC SURGERY:  
INTERNATIONAL BICENTRIC PROSPECTIVE STUDY**

Joao-Carlos Das Neves Pereira<sup>1</sup>, C. Pricopi<sup>1</sup>, C. Rivera<sup>1</sup>, J. Hubsch<sup>2</sup>, P. Bagan<sup>1</sup>, A. Badia<sup>1</sup>,  
A. Arame<sup>1</sup>, B. Grand<sup>1</sup>, W. Murphy<sup>2</sup>, F. Le Pimpec-Barthes<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Georges Pompidou European Hospital, Paris, France*

<sup>2</sup>*Anesthesiology, Georges Pompidou European Hospital, Paris, France*

**Objectives:**

To verify if it is possible and safe to perform outpatient or overnight general Thoracic Surgery, including lobectomy, applying the “Fast-Track” rehabilitation programme. This prospective study was carried out in two departments of General Thoracic Surgery in University Hospitals in 2 countries.

**Video description:**

Extreme Fast-Track rehabilitation protocol was applied in two General Thoracic Surgery Departments in two countries. Major surgical procedures, except pneumonectomy and pleuro-pneumonectomy, were included. It consisted in immediate postoperative extubation followed by massage and physiotherapy in the recovery room. Within the first four hours oral feeding and intense physical exercises were performed as soon as possible under oral opioid-free analgesia. Elder patients walked and biked according to their specific capabilities, younger patients could even run at the nursery corridor without pain. Physiotherapists also teach patients families how to perform quick massage at home in order to obtain muscle relaxation. Some patients who underwent both traditional and extreme Fast-Track rehabilitation protocol for General Thoracic surgeries describe their comparative experience. Even lung transplanted patient received Fast-Track Rehabilitation care. Finally it shows a patient running in an outside garden some minutes after extubation of a wedge resection thoracic surgery.

**Conclusions:**

Outpatient and overnight thoracic surgery is possible and safe, thanks to extreme “Fast-track” rehabilitation programme but a motivated interdisciplinary group is required to carry it out routinely.

**Disclosure:** No significant relationships.

## V-111

**TRACHEOBRONCHIAL RECONSTRUCTION WITH IMPLANTATION OF THE RIGHT MAIN BRONCHUS: SURGICAL TECHNIQUE IN THE TREATMENT OF TRACHEAL ADENOID CYSTIC CARCINOMA**

Fumiaki Watanabe<sup>1</sup>, M. Takao<sup>2</sup>, H. Tenpaku<sup>2</sup>, I. Yada<sup>1</sup>, K. Itou<sup>3</sup>, M. Naitou<sup>3</sup>, O. Hataji<sup>3</sup>, C. D'Alessandro-Gabazza<sup>4</sup>, E. Gabazza<sup>4</sup>, H. Shimpō<sup>2</sup>

<sup>1</sup>*Thoracic Surgery, Matsusaka Municipal Hospital, Matsusaka, Japan*

<sup>2</sup>*Thoracic Surgery, Mie University Graduate School of Medicine, Tsu, Japan*

<sup>3</sup>*Respiratory Medicine, Matsusaka Municipal Hospital, Matsusaka, Japan*

<sup>4</sup>*Immunology, Mie University Graduate School of Medicine, Tsu, Japan*

**Objectives:**

Adenoid cystic carcinoma (ACC) is a rare malignancy that may also originate in the trachea. Surgical resection is the mainstay of treatment for tracheal AAC but the size and location of the tumor, and the coexistence of underlying diseases can make the surgical procedure very difficult. We performed tracheoplasty using a pedicled autologous bronchial flap in a case of ACC that originated from the lower trachea with malignant invasion to the right main bronchus. The surgical procedure was safe and resulted in an effective closure of the tracheal defects.

**Video description:**

Under general anesthesia, intubation was performed using a left-sided double-lumen endobronchial tube. The azygos vein was resected and the level 2-4 lymph nodes were mobilized and excised to expose the right lower trachea and the tracheobronchial angle region. The invaded lateral wall of the trachea and the right main bronchus were resected, and the incised area was then taken apart to expose the lower trachea and the carina which was carried downward, to the front and backward in continuation with the right main bronchus. The reconstruction was done by suturing the remaining portion of the bronchus to the tracheal defect using interrupted 3-0 Maxson absorbable sutures on the tracheal cartilages, which were positioned approximately 3 mm apart and at a depth of 2 mm. The membranous portion of the trachea was interrupted with 3-0 Maxson running suture. A bronchoscopy study performed on the 24<sup>th</sup> day after operation disclosed a well vascularized anastomotic region.

**Conclusions:**

Multiple surgical complications (e.g., infection, dehiscence, migration, stenosis) can occur when the carina or tracheobronchial angle is invaded by bronchogenic carcinoma of the upper lobe and main bronchus. This surgical procedure is safe and effective to close tracheal defects after non-circumferential resections, in particular, when the end-to-end reconstruction is risky.

**Disclosure:** No significant relationships.



**TUESDAY, 2 JUNE 2015****14:00 - 15:00****SESSION XII: INTERESTING CASES****O-112****A NOVEL STRATEGY FOR INTRAOPERATIVE ANESTHETIC MANAGEMENT DURING TRACHEAL RESECTION**

Xue-Ning Yang, Q. Nie, S. Dong, W.Z. Zhong, R.Q. Liao, Y.L. Wu  
*Division of Surgery, Department of Pulmonary Oncology, Guangdong Lung Cancer Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou, China*

**Objectives:**

Total video-assisted thoracoscopic (VATS) tracheal tumor resection rarely reported due to difficulty in surgical technique and anaesthetic management. We report a case underwent total VATS resection of tracheal tumor and reconstruction of trachea used three-dimensional (3D) thoracoscope under extracorporeal membrane oxygenation (ECMO).

**Case description:**

This 65-year-old man with a history of Whipple's operation for pancreatic cancer 5 years ago. He was found having a mass distal to trachea by chest computed tomography (CT) during his follow-up. Fiberoptic bronchoscopy and biopsy proved the mass is primary tracheal squamous carcinoma. Informed consent for ECMO and VATS were obtained after an in-depth discussion. The patient received general anesthesia with endotracheal intubation. VATS was performed via three-incisions. We use three-dimensional (3D) thoracoscope (3D TIPCAM; Karl Storz GmbH, Tuttlinger, Germany) for VATS. Azygos vein was transected and paratracheal lymph node dissection, the trachea was mobilized. Then ventilation and oxygenation were maintained by ECMO. A length of 3.0cm of tracheal was sleeve resected, distal and proximal margin confirmed free of tumor by frozen section. The tracheal tumor size is 1.8cm\*1.2cm, and the tumor invade full-thickness of the trachea. An end-to-end anastomosis was performed with Vicryl 4/0 sutures. Total operative time is 410 minutes, ECMO is 190 minutes. Blood loss is 1200ml. Postoperatively, the patient's head was flexed in a chin to chest position with two interrupted sutures for 2 weeks. The patient was then weaned from ECMO and was transferred to the intensive care unit (ICU) for postoperative care. The patient was extubated and transferred to a general ward 7 days later, and discharged under discovery 15 days later. The patient has been followed for 5 months and recovers well.

**Conclusions:**

ECMO is a feasible and beneficial technique to facilitate VATS tracheal tumor surgery. 3D thoracoscope could facilitate tracheal anastomosis and improve safety in tracheal surgery.

**Disclosure:** No significant relationships.

**O-113****A RARE CAUSE OF RESPIRATORY FAILURE AFTER ESOPHAGECTOMY**

Mohammad Hawari<sup>1</sup>, A. Paik<sup>1</sup>, A. Nakas<sup>1</sup>, G. Peek<sup>2</sup>

<sup>1</sup>*Thoracic Surgery, Glenfield Hospital, Leicester; United Kingdom*

<sup>2</sup>*Paediatric Cardiac Surgery & ECMO Glenfield Hospital, Leicester; United Kingdom*

**Objectives:**

We present the case of a 47 year old female, who underwent an Ivor-Lewis Oesophagectomy for persistent achalasia. Her postoperative course was complicated by respiratory failure, which upon investigations revealed complete right lung torsion. We discuss the successful management of this very rare and complex case.

**Case description:**

Following her oesophagectomy at another unit, the patient developed type two respiratory failure and was intubated. CT showed features of acute respiratory distress syndrome. In addition, her right main bronchus, right main pulmonary artery and veins were obstructed at the hilum, with abnormal orientation of the right lobes. Lung torsion was suspected. An exploratory thoracotomy revealed torsion of the entire right lung with further degree of torsion of each lobe, allowed by the presence of complete fissures. The upper and middle lobes appeared dusky compared to the lower lobe. The lung was fully inflated and the hilum was very oedematous, making access and manipulation extremely difficult. The lung was untwisted allowing it to ventilate. Following a period of observation, the chest was closed. A CT pulmonary angiogram showed some restoration of central blood flow. After few days of stabilisation, the patient developed multi-organ failure. Veno-venous ECMO was commenced in view of worsening respiratory failure. Re-exploration occurred while on ECMO one week later. The lung appeared necrotic, shrunken, cystic and black. Pneumonectomy was performed. The patient remained critically unwell post operatively, however she progressed with time and was weaned off ECMO on day 15. She was discharged home three weeks later after intense ward-based physiotherapy.

**Conclusions:**

Complete lung torsion is very rare. It is essential to ascertain the lobes orientation following any thoracic operation especially when the fissures are complete. The support of ECMO while being unstable allowed our patient to tolerate the pneumonectomy and have a favourable outcome at the end.

**Disclosure:** No significant relationships.



O-115

**HOW TO SOLVE THE DISASTER OF A CORROSIVE TRACHEOESOPHAGEAL FISTULA**

Lieven Depypere, P. Nafteux, H. Depraetere, A. Stanzi, P. De Leyn, P. Witters, M. Proesmans, D. Van Raemdonck, H. Van Veer, H. Decaluwé  
*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

Presentation and treatment of a tracheo-esophageal fistula caused by ingestion of a coin battery.

**Case description:**

We present the case of a 9 month old boy who was referred to a local hospital with a tentative diagnosis of gastro-enteritis since 5 days. After an episode of massive haematemesis, the diagnosis of a foreign body in the esophagus was made on chest X-ray. A coin battery was extracted by upper GI endoscopy. Bronchoscopy showed a trachea-esophageal fistula of 2 cm length extending from the carina to the right main stem bronchus. The patient was referred to our center for further treatment on day 7. To prevent ventilatory problems, a central ECMO was installed after a right thoracotomy. The trachea was repaired with an intercostal muscle flap, parachuted over the defect. The esophagus was resected with creation of a cervical esophagostomy and placement of a gastrostomy. ECMO could be discontinued at the end of the operation and the patient was extubated on day 4 postoperatively. After 3 weeks he was discharged home. A colon interposition was performed exactly 5 months after the initial treatment by median laparotomy and left cervicotomy. The postoperative course was complicated by an upper anastomosis leakage which could be treated conservatively. After 5 weeks he could return home, on normal oral feedings.

**Conclusions:**

Ingestion of foreign bodies is not uncommon in children and most of the foreign bodies pass or can be extracted without further problems. Ingestion of coin batteries however can cause potential devastating lesions of the esophagus and surrounding organs due to corrosion in combination with delayed diagnosis.

**Disclosure:** No significant relationships.

V-114

**RIGHT-TO-LEFT ORIENTATION PROBLEMS DURING MINIMALLY INVASIVE IVOR LEWIS ESOPHAGOGASTRECTOMY**

G. Singh<sup>1</sup>, M. Bessler<sup>2</sup>, J. Costa<sup>3</sup>, M. Bacchetta<sup>3</sup>, F. D'Ovidio<sup>1</sup>, M. Biscotti<sup>3</sup>, L. Gorenstein<sup>3</sup>, M. Ginsburg<sup>3</sup>, Joshua Sonett<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Columbia University Medical Center / Herbert Irving Pavillion, New York, United States of America*

<sup>2</sup>*Chief Bariatric / Minimally Invasive Surgery, Columbia University Medical Center, New York, United States of America*

<sup>3</sup>*Cardiothoracic Surgery, Columbia University Medical Center / Herbert Irving Pavillion, New York, United States of America*

**Objectives:**

Situs inversus totalis (SIT) is a rare congenital condition in which the internal organs of the thoracic and abdominal cavities experience a right-to-left reflection across the sagittal plane. This defect is typically asymptomatic, and often undiagnosed; and is usually only recognized after diagnostic imaging for unrelated conditions. However this condition may complicate laparoscopic surgical procedures owing to the changed location of anatomic landmarks. We describe a case of locally advanced adenocarcinoma of the esophagus treated with a totally minimally invasive esophagectomy using a laparoscopic and left video-assisted thoracoscopic surgery (VATS) approach in a patient with situs inversus totalis. An intrathoracic side to side linear anastomosis is highlighted.

**Video description:**

The operating surgeon was positioned on the left side of the patient and we used the standard port placement. The gastrocolic ligament was divided in the usual fashion, and the left gastric pedicle was approached initially from the right (ie, along the splenic artery) and then the gastrohepatic ligament was divided. The left gastric pedicle dissection was completed from the left. The ligament of Treitz was approached from the right when identifying the portion of jejunum to be used for the feeding jejunostomy. In the left chest, the anatomy was as one would expect if we were operating in the right chest so no special accommodations were required other than to approach through the left hemithorax. A 3-cm access incision was made in the fourth intercostal space through which the resected specimen was extracted in a sterile specimen bag. An intrathoracic side to side anastomosis was performed.

**Conclusions:**

Very few cases have been reported for VATS esophagectomy in patients with SIT, the surgical procedures were performed in complete mirror image to the standard position. In this patient a left VATS esophagectomy needed to be performed instead of a right VATS.

**Disclosure:** No significant relationships.

**TUESDAY, 2 JUNE 2015****14:00 - 15:30****SESSION XIII: ESOPHAGUS/MEDIASTINUM****F-116****DOES MINIMAL INVASIVE SURGERY ENHANCE GASTRIC MICROCIRCULATION? A COMPARISON OF GASTRIC MICROCIRCULATION IN OPEN AND ROBOTIC ASSISTED IVOR LEWIS ESOPHAGECTOMY**Rikard Ambrus<sup>1</sup>, M. Jendresen<sup>1</sup>, S. Koefod<sup>1</sup>, M. Achiam<sup>1</sup>, M. Siemssen<sup>2</sup>, L.B. Svendsen<sup>1</sup><sup>1</sup>*Department of Surgical Gastroenterology, Rigshospitalet, Copenhagen, Denmark*<sup>2</sup>*Department of Thoracic Surgery, Rigshospitalet, Copenhagen, Denmark***Objectives:**

At our center, robotic assisted laparotomy, as part of total esophagectomy, has been implemented the last two year, since it is hypothesized to be more beneficial for the patients. However, it is unknown if robotic assisted surgery have benefits on the microcirculatory blood flow. The aim of this presentation is to present data from a recent study, where the microcirculatory blood flow adjacent to the anastomosis was measured by “laser speckle contrast imaging” (LSCI). The study compared the microcirculatory blood flow in conventional (open) esophagectomy with robotic assisted esophagectomy.

**Methods:**

Hemodynamic assessments were according to standardized methods. During conventional surgery, the microcirculation was measured at the antrum and just below the site of the anastomosis (the body) on the stomach: 1) when the peritoneum was first entered, 2) after 15 min. of surgery, 3) after the mobilization of stomach. The microcirculation was then measured at the body and fundus after gastric pull up to the thorax, and finally, after the establishment of the gastro-esophageal anastomosis. During robotic assisted esophagectomy, the microcirculation was measured at the body and fundus after gastric pull up, and after the establishment of the anastomosis.

**Results:**

2 x 25 consecutive patients selected for open- or robot assisted (Da Vinci) surgery due to GEJ adenocarcinoma were included. During laparotomy, the microcirculatory blood flow reduced significantly at the corpus ( $P = 0.04$ , repeated measures ANOVA). In addition, the flow reduced further after gastric pull up to thorax ( $P = 0.009$ ). There was no difference in the microcirculatory blood flow at the corpus and anastomosis, when comparing open- and robotic assisted esophagectomy ( $P = 0.69$  and  $P = 0.22$ , resp.).

**Conclusion:**

Our data shows the feasibility of assessing the microcirculation during open surgery with LSCI. Robotic assisted surgery is not superior to conventional surgery in term of microcirculation of the gastric conduit.

**Disclosure:** No significant relationships.

## F-117

**SURGICAL MANAGEMENT OF PRIMARY MEDIASTINAL HYDATID CYSTS: A 30-YEAR EXPERIENCE**

Atila Eroglu, Y. Aydin, B. Altuntas, A.B. Ulas

*Department of Thoracic Surgery, Ataturk University, Medical Faculty, Erzurum, Turkey*

**Objectives:**

Mediastinal localization of a hydatid cyst is extremely rare and only case reports were found in literature. There are several controversies in the management of these cysts including the optimal surgical approach regarding their management. The purpose of the current study was to evaluate the results of a relatively large cohort of patients with primary mediastinal hydatid cysts who were treated with different surgical techniques.

**Methods:**

We retrospectively reviewed 24 patients who were diagnosed and surgically treated for primary mediastinal hydatid cysts in our clinic between 1985 and January 2015. There were 14 men and 10 women. The age of the patients ranged from 11 to 73, the mean age being 32 years.

**Results:**

The most common symptoms were cough (58.3%), chest pain (50%), and dyspnea (20.8%). The cyst was located in the anterior mediastinum in ten patients (41.7%), in the posterior mediastinum in nine patients (37.5%) and in the middle mediastinum in five patients (20.8%). The approaches utilized included right thoracotomy (n=9), left thoracotomy (n:7) video assisted thoracoscopic surgery (VATS)(n=5), and median sternotomy (n=3). The most common procedure performed was total pericystectomy in 79.2% of patients (n:19). Five cases required partial cystectomy and local curettage due to dense adhesions surrounding vital structures. There were no morbidity, mortality and recurrence postoperatively.

**Conclusion:**

Although primary mediastinal hydatid cyst is extremely rare, it should be kept in mind in differential diagnosis of mediastinal cystic lesions especially in endemic regions. Surgery of mediastinal hydatid cyst is both diagnostic and curative. A minimally invasive approach to the management of mediastinal hydatid cyst is safe and effective when performed by surgeons experienced in minimally invasive techniques.

**Disclosure:** No significant relationships.



F-118

**COMPARISON OF OUTCOMES BETWEEN NEUROENDOCRINE THYMIC TUMORS AND OTHER SUBTYPES OF THYMIC CARCINOMAS. A JOINT ANALYSIS OF THE EUROPEAN SOCIETY OF THORACIC SURGEONS AND THE INTERNATIONAL THYMIC MALIGNANCY INTEREST GROUP**

Pier Luigi Filosso<sup>1</sup>, X. Yao<sup>2</sup>, U. Ahmad<sup>3</sup>, E. Ruffini<sup>1</sup>, A. Antonicelli<sup>4</sup>, J. Huang<sup>3</sup>, F. Guerrero<sup>1</sup>, F. Venuta<sup>5</sup>, D. Van Raemdonck<sup>6</sup>, W. Travis<sup>7</sup>, A. Rimner<sup>8</sup>, P. Thomas<sup>9</sup>, M. Lucchi<sup>10</sup>, G. Rocco<sup>11</sup>, W. Weder<sup>12</sup>, F. Detterbeck<sup>4</sup>, R. Korst<sup>13</sup>

<sup>1</sup>*Thoracic Surgery, University of Turin, Turin, Italy*

<sup>2</sup>*Biostatistics, Yale University School of Medicine, New Haven, United States of America,*

<sup>3</sup>*Thoracic Surgery, Memorial Sloan Kettering Cancer Center, New York, United States of America*

<sup>4</sup>*Thoracic Surgery, Yale University School of Medicine, New Haven, United States of America*

<sup>5</sup>*Thoracic Surgery, University of Rome Sapienza, Rome, Italy*

<sup>6</sup>*Experimental Thoracic Surgery, Leuven University, Leuven, Belgium*

<sup>7</sup>*Pathology, Memorial Sloan Kettering Cancer Center, New York, United States of America*

<sup>8</sup>*Radiation Oncology, Memorial Sloan Kettering Cancer Center, New York, United States of America*

<sup>9</sup>*Thoracic Surgery, North University Hospital - Aix-Marseille University, Marseille, France*

<sup>10</sup>*Thoracic Surgery, Pisa University, Pisa, Italy*

<sup>11</sup>*Thoracic Surgery, National Tumor Institute, Naples, Italy*

<sup>12</sup>*Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*

<sup>13</sup>*Thoracic Surgery, The Valley Hospital, Ridgewood, United States of America*

**Objectives:**

The latest World Health Organization (WHO) histologic classification divides thymic tumors in Thymomas and Thymic Carcinomas, the latter also including the Neuroendocrine Thymic Tumors (NETTs). NETTs and other Thymic Carcinomas histotypes (TCs) portend a significantly lower survival than Thymomas, but differences between these two groups of tumors have rarely been investigated. Using the European Society of Thoracic Surgeons (ESTS) and the International Thymic Malignancy Interest Group (ITMIG) datasets, we aimed at addressing this issue.

**Methods:**

This is a retrospective multicentric (66 Institutions worldwide) cohort study of patients treated for Thymic Carcinoma. Study end-points were: Overall Survival (OS) and Cumulative Incidence of Recurrences (CIR). OS was analyzed using the Kaplan-Meier method and CIR was assessed using competing risk analysis. The association with clinical and prognostic factors for OS and CIR were evaluated with log rank test and Gray's test, respectively.

**Results:**

Overall, 1247 tumors were collected between 1984 and 2012. Patients' characteristics are described in Table 1. A R0 resection was performed in 308 TCs and in 42 NETTs. The median

follow-up was 4.4 years for TCs and 4.1 years for NETTs. At the end of follow-up 303 TC and 52 NETT patients died. The median OS was 6.6 years for TC and 7.5 years for NETTs. While the overall 5-year survival rates were 60% for TC and 68% for NETTs, the 10-year survival rates for TCs and NETTs were 40% and 39% respectively (P=.19, Fig. 1A). Five-year CIR were .35 and .34 for TCs and NETTs, respectively (P=.36, Fig. 1B). At multivariate analysis, histology did not influence either OS (P=.36) or CIR (P=.41).

° Thymic Carcinoma § Neuroendocrine Thymic Tumor \*Chi-Square test

	N	(%)	TC ° (N)	(%)	NETT§	(%)	P *
<b>Gender (858)</b>							0.0004
female	326	38%	294	40%	32	24%	
male	532	62%	432	60%	100	76%	
<b>Age(Median - Range)</b>			56	(12-88)	54	(19-83)	0.0567
<b>Tumorsize (Median - Range)</b>			6.7	(1-18)	7.9	(2.1-30)	<0.0001
<b>Previous Malignancies (650)</b>							0.0253
No	575	88%	490	88%	85	89%	
Yes	75	12%	64	12%	11	11%	
<b>Pathological Masaoka Stage (717)</b>							0.0038
I/II	167	23%	135	22%	32	30%	
III	316	44%	279	46%	37	35%	
IVa	103	14%	94	15%	9	8%	
IVb	131	18%	102	17%	29	27%	
<b>Resection Status (566)</b>							0.118
R0	350	62%	42	54%	308	63%	
R1/2	216	38%	36	46%	180	37%	
<b>Chemotherapy (725)</b>							0.0010
No	275	38%	220	35%	55	52%	
Yes	450	62%	400	65%	50	48%	
<b>Radiotherapy (740)</b>							0.0186
No	211	29%	170	27%	41	38%	
Yes	529	71%	462	73%	67	62%	



**Conclusion:**

This is the largest clinical series of Thymic Carcinomas ever collected. Our results confirm the remarkable biological aggressiveness of such rare neoplasms. After surgery, TCs and NETT showed a similar survival and probability to develop recurrences.

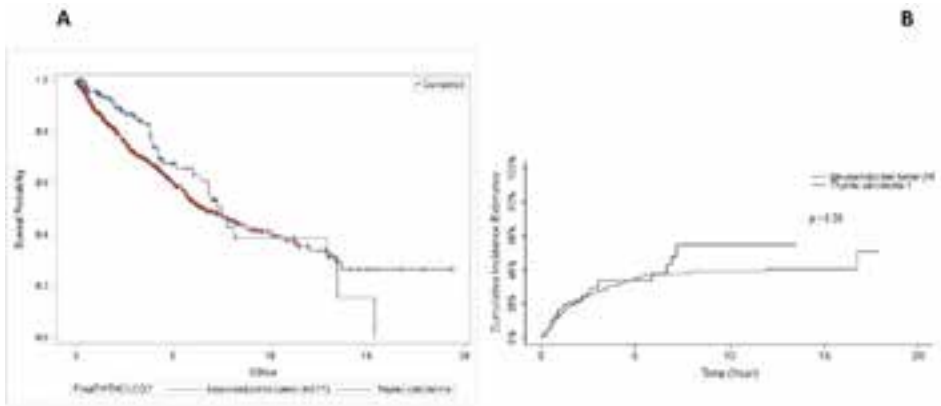


Fig. 1A: Overall Survival (OS) by histology in Thymic Carcinoma  
 Fig. 1B: Cumulative Incidence of Recurrence (CIR) by histology in Thymic Carcinoma

**Disclosure:** No significant relationships.

F-119

**PATIENTS WITH BARRETT'S ESOPHAGUS AND ADENOCARCINOMA OF THE ESOPHAGUS AND ESOPHAGOGASTRIC JUNCTION HAVE INCREASED OXIDATIVE STRESS ALSO IN PROXIMAL STOMACH**Juha Kauppi<sup>1</sup>, J. Rasanen<sup>1</sup>, E. Sihvo<sup>1</sup>, M. Ahotupa<sup>2</sup>, J. Salo<sup>1</sup><sup>1</sup>*Department of General Thoracic and Esophageal Surgery Clinic, Heart and Lung Center, Helsinki University Central Hospital, Helsinki, Finland*<sup>2</sup>*Department of Biosciences, Turku University, Turku, Finland***Objectives:**

Oxidative stress (OS) is an essential element in the pathogenesis of several cancers, including Barrett's esophagus (BE) and its transformation to esophageal adenocarcinoma (EAC). The state of oxidative stress in proximal stomach of patients with BE and EAC is unknown. Isoprostanes are a very specific marker of OS and not previously used in determining OS from BE/EAC tissue samples.

**Methods:**

OS was measured from 42 patients having BE (n= 9), EAC (n=9,) and both (n=24). The control group included 15 patients with healthy gastric and esophageal mucosa. Biopsies were taken 5 cm below and above the squamo-columnar junction, and from obvious area tumor. 8-Isoprostanes (8-IP) were determined by STAT-8-Isoprostane EIA Kit. Glutathione reduced form (GSH) and glutathione oxidized form (GSSG) were measured by Glutathione Assay Kit (Cayman Chemical, Ann Arbor, MI, USA). 8-OH-deoxyguanosine was measured by the OxiSelect™ Oxidative DNA Damage ELISA Kit (8-OHdG) (Cell Biolabs, Inc., San Diego, CA, USA).

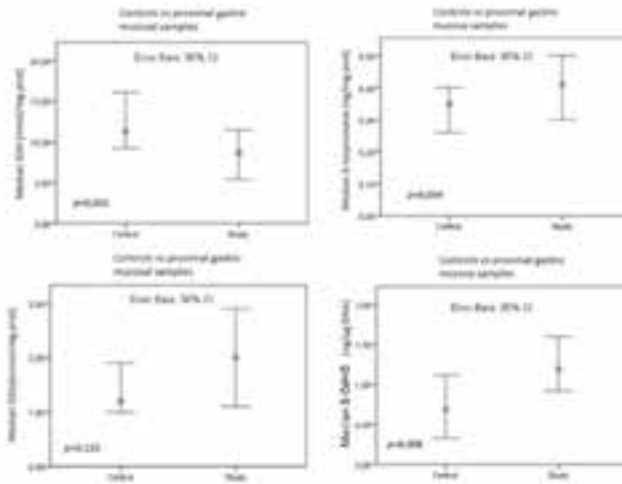
**Results:**

The content of 8-IP (p=0.039) and 8-OHdG (p=0.008) were higher and GSH lower (p=0.031) in proximal stomach of the study group as compared to controls. Results of SO in BE, EAC and controls are shown in Figures 1. Helicobacter pylori infection was present in 8% of study patient.

**Conclusion:**

In proximal stomach of BE and EAC patients oxidative stress is elevated and antioxidative capacity reduced. This finding suggests that gastroesophageal reflux causing BE also induces oxidative stress in proximal stomach, and may contribute to development of cancer of proximal stomach and gastric cardia.

Figure 1. Comparisons of levels of GSH (Glutathione, reduced form), GSSG (Glutathione, oxidized form), 8-isoprostane and 8-OH-deoxyguanosine (8-OHdG) between study and control groups. Mann Whitney U test.



**Disclosure:** No significant relationships.

F-120

**PATIENT-DERIVED SCORE BETTER DISCRIMINATOR OF OVERALL SURVIVAL THAN CLINICIAN-ASSIGNED ECOG STATUS**Biniam Kidane<sup>1</sup>, J. Sulman<sup>2</sup>, W. Xu<sup>3</sup>, Q.Q. Kong<sup>3</sup>, R. Wong<sup>4</sup>, J. Knox<sup>5</sup>, G.E. Darling<sup>1</sup><sup>1</sup>*Thoracic Surgery, University of Toronto, Toronto, Canada*<sup>2</sup>*Social Work, University of Toronto, Toronto, Canada*<sup>3</sup>*Surgery, University of Toronto, Toronto, Canada*<sup>4</sup>*Radiation Oncology, Princess Margaret Hospital, Toronto, Canada*<sup>5</sup>*Medical Oncology, Princess Margaret Hospital, Toronto, Canada***Objectives:**

Functional Assessment of Cancer Therapy-Esophagus (FACT-E) is a validated health-related quality of life (HRQOL) instrument containing an esophageal cancer subscale (ECS). Our objective was to assess the discriminative ability of baseline FACT-E and ECS as compared to ECOG performance status in predicting overall survival in patients with Stage II-IV cancer of the gastroesophageal junction or thoracic esophagus.

**Methods:**

Data from 4 Canadian prospective studies were combined. These studies included consecutive patients with clinical stage II-IV cancer of the gastroesophageal junction or thoracic esophagus who received chemoradiation either as neoadjuvant or definitive therapy. One study utilized adjuvant sunitinib. Three separate Cox regressions were performed with overall survival as the outcome and FACT-E, ECS and ECOG as the main predictors, respectively. These regressions controlled for age, stage, histology and treatment intent (curative versus palliative).

**Results:**

Overall, 128 patients had complete data. Mean age was 60.1±10.3 years with 69.5% (n=89) adenocarcinomas. Eight (6.3%) patients had palliative-intent therapy. Fourteen (10.9%) patients had sunitinib. Seventy-five deaths were observed. Mean FACT-E and ECS scores were 79.1±17.9 and 47.1±12.7, respectively. Overall, 39.8% (n=51), 58.6% (n=75) and 1.6% (n=2) had ECOG performance statuses 0, 1 and 2, respectively. Baseline FACT-E and ECS independently predicted survival (both p<0.001) whereas ECOG did not (p=0.91). The regression models using FACT-E and ECS demonstrated better discrimination than the model utilizing ECOG (c-statistics 0.63 and 0.65 versus 0.51).

**Conclusion:**

In patients with stage II-IV esophageal cancer being considered for chemoradiation therapy, baseline FACT-E and ECS appear to have better discrimination for survival than ECOG. The majority of patients were ECOG 0/1. Thus, these patient-derived scores were able to discriminate survivors from non-survivors even within this constrained range of clinician-assigned performance status. This highlights the potential utility of FACT-E and ECS as prognostic tools in practice and trials.

**Disclosure:** No significant relationships.



F-121

**COMBINED HEMI-LAMINECTOMY AND THORACOSCOPIC PROCEDURE:  
AN OPTIMAL TRIAGE FOR SURGICAL RESECTION OF THORACIC  
DUMBBELL TUMORS**Chengwu Liu<sup>1</sup>, F. Ren<sup>2</sup>, J. Mei<sup>1</sup>, Q. Pu<sup>1</sup>, L. Ma<sup>1</sup>, L. Liu<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, West China Hospital, Sichuan University, Chengdu, China*<sup>2</sup>*Department of Thoracic Surgery, The Third People's Hospital of Chengdu, Chengdu, China***Objectives:**

Complete resection is the definite therapy of choice for the treatment of thoracic spine dumbbell tumors while the surgical approaches are diversified. This study aims to evaluate the effectiveness of combined hemilaminectomy and thoracoscopic procedure in the treatment of thoracic spine dumbbell tumors in a larger series.

**Methods:**

Between June 2006 and September 2014, 17 patients with thoracic spine dumbbell tumors underwent complete resection of the tumors through hemilaminectomy followed by thoracoscopic surgery in a single stage. Data were collected by retrospectively reviewing the clinical record of each patient, and a follow-up was conducted to each patient with the deadline set to November 2014.

**Results:**

All patients underwent complete resection of both the intraspinal and intrathoracic tumor components. The median operating time was 220 min (range, 160 to 300 min) and the median blood loss was 100 ml (range, 20 to 350 ml). One patient experienced cerebrospinal fluid leakage and he was cured faultlessly. There was no perioperative mortality. The median postoperative hospital stay was 7 days (range, 4 to 15 days). Postoperative pathological examination confirmed 12 cases of schwannoma, three cases of neurofibroma, one case of ganglion cell glioma, and one case of meningioma. Postoperatively all of the neurological symptoms (such as paresthesia and lower extremity weakness) were relieved. No residual tumor was identified by follow-up MRI scans and no recurrence or disease related death was noted during a median follow-up of 58 months (range 2 to 101 months).

**Conclusion:**

Combined hemilaminectomy and thoracoscopic procedure is an optimal triage for complete resection of thoracic spine dumbbell tumors with excellent either short term or long term outcomes.

**Disclosure:** No significant relationships.

## F-122

**POSTOPERATIVE OUTCOMES AFTER RADICAL THREE-FIELD AND TWO-FIELD LYMPHADENECTOMY FOR ESOPHAGEAL CANCER**

C S Pramesh, G. Karimundackal, S. Jiwnani

*Thoracic Surgery / Surgical Oncology, Tata Memorial Centre, Mumbai, India***Objectives:**

Outcomes after esophageal resection for localized esophageal cancer are suboptimal. One of the strategies advocated for improving survival is radical three-field lymphadenectomy. However, the role of radical lymphadenectomy for esophageal cancer has been a subject of major controversy, primarily because of questionable survival benefit and the morbidity associated with the more radical procedure. We compared the postoperative morbidity and mortality after radical three-field lymph node dissection (3FLND) with a standard two-field lymph node dissection (2FLND).

**Methods:**

We performed a retrospective analysis of a prospectively maintained database of esophageal resections for cancer done at a tertiary referral cancer centre between Oct 2003 and Dec 2014. Consecutive patients who underwent either a radical three-field or a standard type two-field lymphadenectomy were included in the study. The morbidity and mortality after surgery were recorded in a standardized format and were compared between the two groups. Categorical data were analysed using the chi square test and numeric data using the Student t test. A p value of 0.05 was considered statistically significant and no adjustment was made for multiple comparisons.

**Results:**

A total of 1939 patients were operated for esophageal cancer between 1<sup>st</sup> October 2003 and 31<sup>st</sup> Dec 2014. 451 patients who underwent 3FLND and 844 patients who underwent 2FLND were included in the study. Mean number of lymph nodes retrieved in the two groups were 38.8 and 22.5 respectively (p=0.000). Morbidity and mortality results are shown in the table below.

Complication	3FLND (n=451)	2FLND (n=844)	p value
Pulmonary	169(37.5%)	190(22.5%)	0.000
Anastomotic leaks	54(12%)	92(11%)	0.587
Tracheostomy	122(27.1%)	128(15.2%)	0.000
Major morbidity	139(30.8%)	215(25.5%)	0.051
Mortality	27(6.0%)	54(6.4%)	0.747

**Conclusion:**

Radical 3FLND is associated with significantly higher complication rates compared to 2FLND; however, most complications are manageable and there are no significant differences in post-operative mortality. Randomized trials comparing the two procedures will answer the question of oncological superiority of 3FLND for esophageal cancer.

**Disclosure:** No significant relationships.



F-123

**QUALITY OF LIFE AND PAIN OUTCOMES AFTER ROBOTIC ASSISTED MINIMALLY INVASIVE ESOPHAGECTOMY AND OPEN ESOPHAGECTOMY: SHORT-TERM RESULTS OF A PROSPECTIVE TRIAL**

Inderpal Sarkaria<sup>1</sup>, R. Grosser<sup>2</sup>, D. Goldman<sup>2</sup>, A. Ghanie<sup>2</sup>, C. Sima<sup>2</sup>, M. Bains<sup>3</sup>, P. Adusumilli<sup>3</sup>, V. Rusch<sup>3</sup>, D. Jones<sup>3</sup>, N. Rizk<sup>3</sup>

<sup>1</sup>*Cardiothoracic Surgery, University of Pittsburgh Medical Center, Pittsburgh, United States of America*

<sup>2</sup>*Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, United States of America*

<sup>3</sup>*Thoracic Surgery, Memorial Sloan Kettering Cancer Center, New York, United States of America*

**Objectives:**

Growing evidence supports improved peri-operative outcomes with minimally invasive esophagectomy (MIE) compared to open esophagectomy (OE), although the impact on quality of life (QOL) is less clear. We report the short-term results of a prospective trial with patient reported QOL.

**Methods:**

A prospective QOL trial of sequential patients undergoing MIE or OE was conducted using the Functional Assessment of Cancer Therapy Esophageal subset (FACT-E) and Brief Pain Inventory (BPI) at baseline, post-operatively inpatient, first post-operative visit, and 4 months. Secondary outcomes included peri-operative data, morbidity, and mortality.

**Results:**

83 OE and 55 MIE were enrolled. 54/55 (98%) of MIEs were Robotic Assisted MIE (RAMIE). Demographics and peri-operative outcomes are summarized in Table I. The cohorts were well-matched by age, stage, ASA class, and induction treatment. Total FACT-E scores were improved in the RAMIE cohort post-operatively ( $p=0.01$ ), but not at 4 months ( $p=0.27$ ). Inpatient BPI pain and interference scores improved in the RAMIE group ( $p=0.004$ ), but at the first post-operative visit ( $p=0.24$ ). Length of stay and blood loss were decreased with RAMIE, and lymph node count and operative times were higher. There was no difference in readmission ( $p=0.19$ ) between the cohorts, although multiple readmissions were greater with OE ( $p=0.04$ ). There were no differences in major complication (OE 41/83(49%), RAMIE 25/55 (45%);  $p=0.73$ ), anastomotic leak (OE 6/83(7%), RAMIE 2/55(4%);  $p=0.48$ ), or 90-day mortality (OE 5/83 (6%), RAMIE 0/55 (0%);  $p=0.16$ ) between the cohorts.

**Conclusion:**

Early post-operative QOL measured by patient-reported FACT-E and BPI average pain and interference scores were improved in patients undergoing RAMIE compared to OE. RAMIE resulted in similar or improved peri-operative outcomes, while operative times were greater. These data suggest RAMIE may be an acceptable standard of care for patients with esophageal cancer.

**Disclosure:** No significant relationships.

F-124

**INTRAMURAL METASTASIS AS A RISK FACTOR FOR RECURRENCE IN PATIENTS WITH ESOPHAGEAL SQUAMOUS CELL CARCINOMA**J.H. Jeon, Hee Chul Yang, M.S. Kim, J.M. Lee*Center for Lung Cancer, National Cancer Center, Goyang, Korea***Objectives:**

The purpose of this study was to assess the clinicopathologic implications of intramural metastasis in patients with esophageal squamous cell carcinoma (ESCC).

**Methods:**

We retrospectively analyzed the medical records of 720 patients who underwent esophagectomy without neoadjuvant therapy. Among these patients, intramural metastasis was detected in 39 patients (5.4%). The clinicopathologic features of intramural metastasis were investigated, and its influence on postoperative recurrence was also analyzed.

**Results:**

There were 694 male patients with a mean age of  $64.4 \pm 7.8$  years. The median follow-up period was 32.2 months. Intramural metastasis was associated with advanced T stage ( $p < 0.0001$ ), N stage ( $p < 0.0001$ ), and poor differentiated lesions ( $p = 0.012$ ). The median size of intramural metastasis was 2.5 cm (range: 0.7~6.4), and the median distance from primary tumor to metastasis was 3.0 cm (range: 0.5~21.0). Multiple metastases were observed in 46.2% of cases. Intramural metastasis was detected preoperatively in 52.6 % of cases and was present equally on both directions of the primary lesion. In multivariate analysis, advanced T-stage ( $p < 0.001$ ), advanced N-stage ( $p < 0.001$ ), and presence of intramural metastasis ( $p = 0.014$ ) were independent risk factors for recurrence. The 3-year recurrence-free survival (FRS) was 13.3% for patients with intramural metastasis and 51.1% for those without ( $p < 0.001$ ).

**Conclusion:**

Intramural metastasis could be important prognostic factors, along with anatomical determinants such as TNM staging system in patients with ESCC. Effective surveillance and individualized adjuvant therapy may help improve the outcome of patients with ESCC, particularly when accompanied by intramural metastasis.

**Disclosure:** No significant relationships.



**TUESDAY, 2 JUNE 2015****14:00 - 15:00****SESSION XIV: AIRWAY/TRANSPLANTATION****F-125****DONORS WITH PRIOR HISTORY OF CARDIAC SURGERY ARE A VIABLE SOURCE OF LUNG ALLOGRAFTS**

*Joseph Costa, G. Singh, M. Lavelle, S. Sreekanth, M. Bacchetta, J. Sonett, F. D'Ovidio  
Thoracic Surgery, Columbia University Medical Center, New York, United States of America*

**Objectives:**

End stage lung disease continues to rise despite the lack of suitable lung donors, limiting the numbers of lung transplants performed each year. Expanded donor criteria, use of donation after cardiac death donors, and the advent of ex-vivo lung perfusion have resulted in a slight increase in donor lung utilization. Organ donors with prior cardiac surgery present risks and technical challenges, however may be a potential source of suitable lung allografts with an experienced procurement surgeon. We present our experience having evaluated potential lung donors with a prior history of cardiac surgery, resulting in successful transplant outcomes.

**Methods:**

This is a single institution retrospective review of brain dead organ donors that were evaluated for lung donation in the period of 2012-2014. Donor and recipient characteristics were collected. Post lung-Tx survival was recorded. The study was approved by the institutional review board.

**Results:**

From 2012-2014, 256 donors were evaluated, 9 with prior history of cardiac surgery of which 3 had coronary artery bypass, 2 had aortic root replacement, 1 pulmonary embolectomy, 2 aortic valve replacements, 1 triple valve replacement. Re-operative donors 5/9 (45% dry run) provided suitable allografts generating 6 single lung Transplants (3 right and 3 left). Interval between cardiac surgery and procurement for those rejected was median 6840 days (IQR 1838-9090) and interval for the donors that provided allografts was median 408 days (IQR 336-938) (Mann-Whitney  $p=0.07$ ). To date all recipients from re-operative donors are alive. Recipient 1-year survival was 92% for non re-operative lung allografts (2012/2013).

**DONOR CHARACTERISTICS**

	Standard BDD (246)	Re-Operative BDD (9)		
		All	Tx	No Tx
Age	35.5 (13-66)	46 (22-65)	44 (22-62)	49.5 (41-65)
Male	99 (40%)	6 (67%)	3 (33%)	3 (33%)
Smoking (>20ppy)	6	0	0	0
PO <sub>2</sub>	424.5 (201-615)	370 (256-555)	454 (329-555)	321.5 (256-397)

**RECIPIENT CHARACTERISTICS**

	BDD Lungs (136)	Re-Operative BDD Lungs (6)
	Age	59 (18-74)
Male	80 (59%)	2 (33%)
Diagnosis:		
COPD	19 (14%)	2 (33%)
ILD	86 (63%)	4 (67%)
CF	27 (20%)	0
other	4 (3%)	0
LAS	48.42 (32.8-95.3)	48.07 (41.5-94.8)
CI	282 (135-605)	325 (180-480)
PGD 24 hr		
0	72 (53%)	1 (17%)
1	42 (31%)	4 (67%)
2	20 (15%)	1 (17%)
3	2 (1%)	0%
PGD 48 hr		
0	85 (63%)	2 (33%)
1	39 (29%)	4 (67%)
2	12 (9%)	0%
3	0%	0%
PGD 72 hr		
0	88 (65%)	3 (50%)
1	36 (26%)	3 (50%)
2	11 (8%)	0%
3	1 (0.7%)	0%

**BDD:** Brain Dead Donor; **Tx:** transplant; **COPD:** Chronic Obstructive Pulmonary Disease;

**ILD:** Interstitial Lung Disease; **CF:** Cystic Fibrosis; **LAS:** Lung allocation score, **CI:** Cold ischemic time,

**PGD:** Primary Graft Dysfunction. Data shown as median (range).

**Conclusion:**

To date this is the largest single center experience using lung allografts from brain dead donors with prior cardiac surgery. Our experience shows despite predicted technical difficulties, with good communication between thoracic and abdominal teams, successful transplant outcomes are possible, when surgeons with experience in re-operative cases are sent for lung procurements.

**Disclosure:** No significant relationships.

F-126

**THE IMPACT OF DONOR COMORBIDITIES IN PREDICTING LONG-TERM SURVIVAL IN LUNG TRANSPLANTATION: THE ZURICH DONOR SCORE**Ilhan Inci<sup>1</sup>, J. Ehrsam<sup>1</sup>, S. Hillinger<sup>1</sup>, I. Opitz<sup>1</sup>, D. Schneiter<sup>1</sup>, C. Benden<sup>2</sup>, W. Weder<sup>1</sup><sup>1</sup>*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*<sup>2</sup>*Division of Pulmonary Medicine, University Hospital Zurich, Zurich, Switzerland***Objectives:**

Organ shortage and a growing demand for lung transplantations led several centers to increasingly use donor lungs with extended criteria. A donor scoring system to predict post-transplant outcome might be helpful.

**Methods:**

Donor lung quality was assessed by Zurich Donor Score (ZDS) (N=403) consisting six extended donor criteria including age  $\geq 55$  years, smoking history  $\geq 20$  pack/year, abnormal chest X-ray, pathologic bronchoscopy, ABO compatibility and PaO<sub>2</sub>-FiO<sub>2</sub> Ratio  $< 300$ mmHg and 5 donor comorbidities including systemic arterial hypertension, cardiac disease, insulin dependent diabetes mellitus, chronic renal and hepatic disease. In a multivariate analysis ZDS was also compared with the existing Oto and Eurotransplant Donor Scores using the same confounders.

**Results:**

In univariate analysis donor smoking history of  $\geq 20$ py (N= 62, HR 1.59; 95%CI 1.10-2.29) and systemic hypertension revealed as significant risk factors for mortality (N=61, HR 1.65; 95% CI 1.15-2.38, p=0.007). The recipients receiving lungs with ZDS  $\geq 3$  had worse 1- and 5 year survival rates (N=89, 75% and 44%) compared to those with ZDS = 0 (N=314, 84% and 64%), p=0.001). In multivariate analysis ZDS  $\geq 3$  was a risk factor for mortality (N=89, HR 1.65; %95 CI 1.17-2.3) when tested with three other confounders including intraoperative ECMO/CPB use (N=158, HR 1.57; %95 CI 1.16-2.12), unilateral lung transplantation (N=36, HR 3.5; %95 CI 2.4-5.2) and recipient age  $60 \geq$  years old (N=87, HR 2.18; %95 CI 1.5-3.06). With the same confounders Oto Score  $\geq 9$  had a HR of 1.53 (N=90, 95% CI 1.12-2.1, p=0.01) and Eurotransplant Score  $\geq 9$  had a HR of 1.05 (N=90, 95% CI 0.77-1.43, p=0.7).

**Conclusion:**

The accumulation of three or more extended donor criteria and donor-associated comorbidities can assist to predict long-term outcome in lung transplantation. The validity of ZDS should be proved in larger number of patients before its wide application.

**Disclosure:** No significant relationships.

F-127

**CAN EX VIVO LUNG PERFUSION IMPROVE THE OUTCOME OF SINGLE LUNG TRANSPLANTATION WHEN CONTRALATERAL LUNG IS INJURED?**

Pierre Mordant, T. Saito, S. Azad, T.K. Waddell, S. Keshavjee, M. Cypel  
*Division of General Thoracic Surgery, Toronto General Hospital, Toronto, Canada*

**Objectives:**

Single lung transplantation (SLTx) is an acceptable option for selected patients with pulmonary fibrosis and emphysema. We have previously demonstrated that SLTx carries an increased risk of early death if the contralateral donor lung is severely injured. We sought to determine the impact of *ex vivo* lung perfusion (EVLP) in improved selection of single donor lungs for transplantation.

**Methods:**

All SLTx performed from January 2009 to August 2014 in our institution were reviewed. Recipients were classified into 3 groups according to the fate of the contralateral lung: G1) contralateral lung allocated; G2) contralateral lung declined without EVLP; G3) contralateral lung declined after EVLP. Endpoints include 90-day mortality, primary graft dysfunction (PGD), ICU length of stay (LOS), Hospital LOS, and 1-year mortality.

**Results:**

During the study period, 93 recipients (mean age 61.5±8.8 years) underwent SLTx for idiopathic pulmonary fibrosis (IPF, n=65), COPD/emphysema (n=24), and miscellaneous interstitial diseases (n=4). Among them, 41 patients were classified as G1, 34 patients were classified as G2, and 18 patients were classified as G3. The proportion of patients with IPF was not significantly different between groups (p=0.3420). The proportion of patients who experienced a PGD grade III at any time during the first 72 hours was significantly lower in G1 (n=11, 26%) and G3 (n=5, 27%) than in G2 (n=19, 55%, p=0.0223). There was no significant difference between groups regarding 90-day mortality, ICU length of stay (LOS), Hospital LOS, and 1-year mortality.

**Conclusion:**

This study confirms that SLTx carries an increased risk of adverse outcome if the contralateral donor lung is injured and no EVLP is performed to test the organ prior to transplantation. Further studies are needed to determine the role of EVLP in this setting.

**Disclosure:** T.K. Waddell: Co-founder of Perfusix Canada/USA and XOR Labs Toronto Inc.  
S. Keshavjee: Co-founder of Perfusix Canada/USA and XOR Labs Toronto Inc.  
M. Cypel: Co-founder of Perfusix Canada/USA and XOR Labs Toronto Inc.



F-128

## TRACHEO-CARINAL RECONSTRUCTIONS USING PEDICULATED EXTRATHORACIC MUSCLE FLAPS: A 17-YEAR, SINGLE CENTER EXPERIENCE

Jean Yannis Perentes<sup>1</sup>, J. Blatter<sup>1</sup>, M. Gonzalez<sup>1</sup>, T. Krueger<sup>1</sup>, A. Lovis<sup>2</sup>, H. Ris<sup>1</sup>

<sup>1</sup>Thoracic Surgery, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

<sup>2</sup>Pneumology, University Hospital of Lausanne, Lausanne, Switzerland

### Objectives:





Retrospective evaluation of short and long-term morbidity of tracheo-carinal airway reconstructions using pediculated extrathoracic muscle flaps as airway substitutes or to reduce anastomotic tension in these complex surgeries.

### Methods:

From 1996 to 2013, 67 patients underwent 68 trachea and/or carinal reconstructions using extrathoracic muscle flaps (latissimus dorsi=45; serratus anterior=23; pectoralis major=5) to close airway defects resulting from a) bronchopleural fistulas (BPF) with short desmoplastic bronchial stumps (n=17); (b) partial or complete carinal reconstructions following lobectomy/pneumonectomy (n=31); (c) partial non-circumferential tracheal defects following tumor resection (n=13); (d) tracheal defect management in the context of tracheo-esophageal fistulas (n=7). Airway defects ranged from 2x1 to 10x4cm and involved up to 50% of airway circumference. Mean follow-up time was of 17±10 months.

### Results:

Ninety-day mortality was of 8.0% (6/67 patients) and related to multiorgan failure, massive pulmonary embolism and ARDS (Table1). In-hospital airway complications were observed in 12 patients (18%). These consisted of muscle flap necrosis (n=6) which were successfully managed by surgery (flap replacement or debridement) and airway dehiscence (n=4) which were successfully managed by endobronchial stents or surgical re-suturing. Long-term morbidity consisted in airway stenosis (n=5) which occurred during the first year following surgery and that were all successfully managed by endobronchial stenting or dilation with a median of 10 bronchoscopies per patient. In all surviving patients, airway reconstructions were airtight, stable and re-epithelized.

				
Cases	17	31	13	7
Pathology	BPF (17)	NSCLC IIIA/B (23) Others (8)	Tracheal tumors (6) Tracheal disease (7)	TEF (7)
Lung Resection	P:15, L: 2	P: 24, L: 6, NO: 1	NO: 13	NO: 7
90-day mortality	3 (PE, 2MOF)	3 (PE, ARDS, MOF)	NO	NO
Airway morbidity				
Necrosis 6	1	2	2	1
Dehiscence 4	1	1	2	0
Stenosis 5	0	3	0	2

BPF: Broncho-pleural fistula, P: Pneumorectomy, L: Lobectomy, NO: no lung resection, TEF: tracheo-esophageal fistula, PE: massive pulmonary embolism, ARDS: adult respiratory distress syndrome, MOF: multiorgan failure

### Conclusion:

Extra-thoracic muscle flaps are an interesting option to close airway defects or reduce anastomotic tension in the context of complex tracheo-carinal surgeries.

**Disclosure:** No significant relationships.



F-129

**PHYSIOLOGICAL ASSESSMENT AND CLINICAL OUTCOMES OF EX-VIVO PERFUSED MARGINAL DONOR LUNGS**

Alexis Slama, M. Barta, L. Schillab, A. Mitterbauer, A. Benedek, K. Hoetzenecker, A. Scheed, G. Lang, J.R. Matilla, S. Taghavi, P. Jaksch, W. Klepetko, C. Aigner  
*Division of Thoracic Surgery, Medical University of Vienna, Vienna, Austria*

**Objectives:**

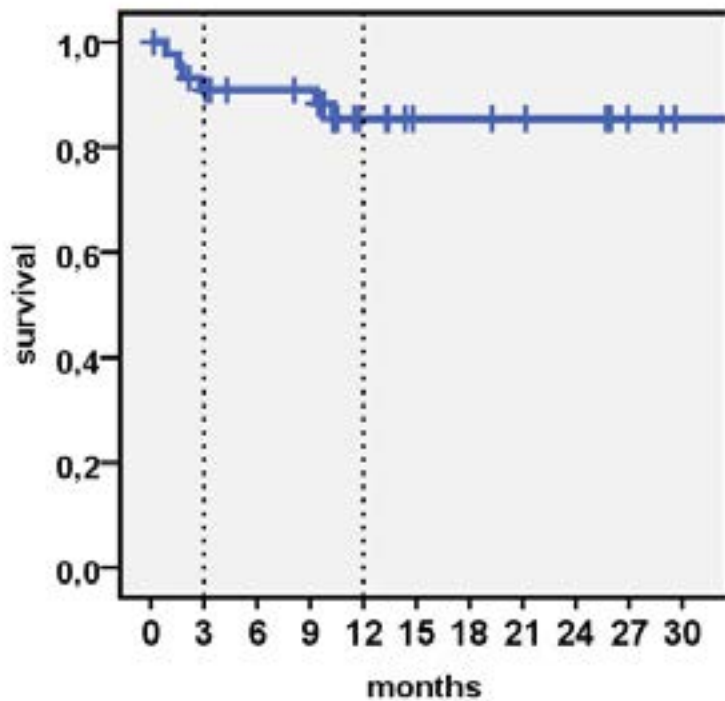
Over the last years, ex-vivo lung perfusion (EVLP) has been progressively implemented in different centers worldwide. Its beneficial effect on donor lung availability has been frequently reported. Nevertheless, clear evidence on any preferable technique and/or evaluation modality is still missing. The aim of this study was to reevaluate our center experience with EVLP of marginal donor lungs in terms of preoperative decision making and clinical outcomes after EVLP.

**Methods:**

Since 3/2010, 45 normothermic EVLP were performed on initially rejected marginal donor lungs. Acellular perfusate (Steen®) was used. Approval for LuTX was given according to perfusate Po<sub>2</sub> and functional parameters (PAP; PeakAWP; dynamic lung compliance). Data is expressed as mean ±SD.

**Results:**

During EVLP, 30 lungs (66,6%) were rated sufficiently good and thereby accepted for LuTX. Donor data did not differ significantly between accepted and rejected lungs (age: 39±14 vs. 46±13 years; p=0,15/ gender; p=0,76/ intubation: 5,4±4,8 vs. 7,0±4,9 days; p=0,32/ PaO<sub>2</sub>: 275±98 vs. 301±106 mmHg; p=0,41). During EVLP, oxygenation was consistently higher in accepted lungs (pvPo<sub>2</sub> in mmHg: t2h: 427±66 vs. 367±60; p=0,007/ t3h: 427±52 vs. 359±73; p=0,002/ t4h: 439 ±54 vs. 373 ±66; p=0,01). Further, ventilation parameters were superior in accepted lungs (peakAWP t2h: 12,6 vs. 15,3; p=0,004/ t3h: 12,3 vs. 15; p=0,004/ t4h: 12,4 vs. 14,5; p=0,081// compliance t2h: 70 vs. 61,3; p=0,26/ t3h: 77,5 vs. 61,4; p=0,07/ t4h: 65,2 vs. 59,4; p=0,48) 56,7% of the recipients were female. Mean recipient age was 48,5±13,6 years. After LuTX, median intubation time was 2 (0,4-203) days. Patients stayed in ICU for 6 days (2-210) and within the hospital for 20 (11-233) days. Postoperative causes of death were: sepsis (n=2), multiple organ failure (n=3), sudden death (n=1). 30-days, 1-year survival and 3-year survival were: 97,7%; 85,4%; 85,4%.

**Conclusion:**

Excellent intermediate term outcome can be achieved after transplantation of ex-vivo perfused lungs.

**Disclosure:** No significant relationships.



F-130

**OUTCOME AFTER PULMONARY ALLOGRAFT COMPLICATIONS NEEDING SURGICAL RESECTION**

J. Nijs<sup>1</sup>, D. Ruttens<sup>2</sup>, S. Verleden<sup>2</sup>, W. Coosemans<sup>1</sup>, H. Decaluwé<sup>1</sup>, P. De Leyn<sup>1</sup>, P. Naftoux<sup>1</sup>, H. Van Veer<sup>1</sup>, G.M. Verleden<sup>3</sup>, Dirk Van Raemdonck<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

<sup>2</sup>*Laboratory for Pneumology, KU Leuven University, Leuven, Belgium*

<sup>3</sup>*Pneumology, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

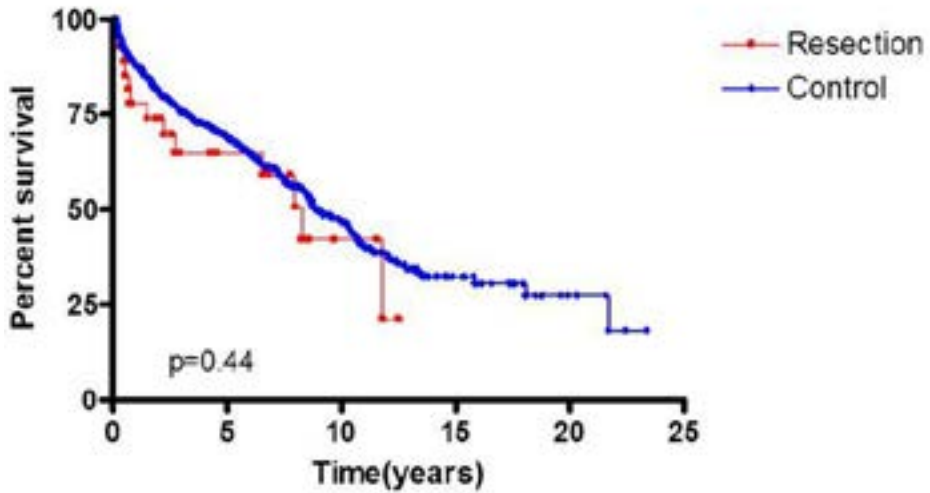
Outcome after lung transplantation (LTx) may be compromised by early or late anastomotic, infectious or tumoral complications in the allograft requiring partial or complete resection. We aimed to study the frequency of all three complications and compared outcome with other recipients who survived with intact allograft.

**Methods:**

Institutional database was searched for all patients with partial or complete resection of allograft between 07/1991-10/2014. In total, 819 LTx (SL:159; SSL:613; HL:47) were performed in 782 recipients. Thirty six patients in whom the allograft was explanted at the occasion of retransplantation for chronic lung allograft dysfunction (CLAD), were excluded from the analysis.

**Results:**

Pulmonary allograft was resected in 27/782 patients (3.5%) [16F/11M; age: 50±2yrs; SL/SSL/HL:3/24/0] for emphysema (16), cystic fibrosis (4), pulmonary fibrosis (3), bronchiectasis (2), idiopathic pulmonary arterial hypertension (1), and CLAD (1) because of anastomotic complications (11) [bronchial:7; arterial:2; venous:2], infection (5), or tumor (11) [PTLD:2; cancer:9]. Resection extended to: sleeve main bronchus (1), wedge excision (6), segmentectomy (2), lobectomy (7), and pneumonectomy (11) including one patient who survived urgent redo SSLTx for PGD3 following venous thrombosis. The mean interval from LTx to resection was 156±56, 358±137, and 1438±302 days in patients with anastomotic, infectious, and tumoral complications, respectively. Three-month mortality was 10%, 0%, and 0%, respectively. Median and overall survival at 1, 3, 5, and 10 years in this group were 8.28 yrs, 75%, 65%, 65%, and 42% compared to 8.87 yrs, 88%, 75%, 69%, and 47% in group with intact allograft (NS).

**Conclusion:**

Allograft resection was needed in 3.5% of all lung transplants: 41% for anastomotic complications (5 months), 18% for infection (1 year), 41% for tumor (4 years). Despite a shorter graft survival and higher early mortality in patients with anastomotic complications, late survival in resected group was comparable to other recipients with intact allografts.

**Disclosure:** No significant relationships.

**TUESDAY, 2 JUNE 2015****15:30 - 17:30****SESSION XV: CHEST WALL/DIAPHRAGM/PLEURA****O-131****CORRELATION BETWEEN METEOROLOGICAL CONDITIONS AND PNEUMOTHORAX: MYTH OR FACT?**

Mustafa Akylı<sup>1</sup>, C. Tezel<sup>1</sup>, S. Evman<sup>1</sup>, S. Kanbur Metin<sup>1</sup>, M. Vayvada<sup>1</sup>, F. Tokgöz Akylı<sup>2</sup>, I. Ocakcioglu<sup>1</sup>, V. Baysungur<sup>1</sup>, I. Yalcinkaya<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Sureyyapasa Thoracic Diseases and Surgery Training and Research Hospital, Istanbul, Turkey*

<sup>2</sup>*Chest Disease, Sureyyapasa Chest Diseases and Thoracic Surgery Training and Research Hospital, Istanbul, Turkey*

**Objectives:**

There is no consensus in recent literature regarding the factors triggering the primary spontaneous pneumothorax (PSP). Atmospheric pressure or other weather alterations are suspected, but published papers result in disagreement to each other. In our study, we analyzed the roles of barometric pressure, air temperature, humidity rate, and wind velocity on PSP development.

**Methods:**

Patients' files were evaluated retrospectively, who were diagnosed with PSP in our clinic from January 2010 to January 2014. The average air temperature (°C), wind velocity (km/s), and humidity rate (%) was analyzed with pressure values (mbar) obtained by the State Meteorological Services, from two international airports within city limits. Average of two values was accepted as city's daily atmospheric air pressure. Patient admission was assessed according to seasonal and monthly distribution. All the working days were divided into 2 groups as days with at least one PSP patient admittance (Group 1), and days with no PSP patient admittance (Group 2).

**Results:**

Total of 1097 (975 male) patients with an age average of  $23.5 \pm 4.0$  (17-32) admitted to our clinic within 1460 study days with sufficient weather data. Peak time of applications were recorded in october (n=131;12%) and in autumn (n=330;30%). One or more PSP patients have admitted, on total of 759 days. There was no significant difference between the mean air temperature, humidity rate, and the wind velocity between the groups. Atmospheric pressure was found to be significantly lower on Group 1 ( $P < 0.001$ ). Decrease of atmospheric pressure in comparison with the previous day, indicated a significant increase of PSP risk ( $P < 0.001$ ). Weather data of the two Groups are listed in Table 1.

Table 1: Averages of meteorological changes between groups

	<b>Group 1 (n=759)</b>	<b>Group 2 (n=701)</b>	<b>p</b>
Temperature (°C)	16.1±8.1	16.2±8.2	0.842
Temperature increase/no change/decrease (%)	43/19/38	40/24/36	0.833
Average temperature difference (absolute value)	2.0±1.9	1.9±1.8	0.130
Wind speed (km/h)	14.8±6.0	14.6±6.6	0.717
Wind speed increase/no change/decrease (%)	42/9/49	44/12/44	0.187
Average wind speed difference	5.1±4.6	5.5±4.8	0.313
Humidity (%)	67.4±10.8	69.3±29.1	0.173
Humidity increase/no change/decrease (%)	51/3/46	48/4/48	0.615
Average humidity difference	9.4±7.7	10.2±28.2	0.355
Pressure (mbar)	1007.5±6.2	1011.8±6.5	<b>&lt;0.001</b>
Pressure increase/no change/decrease (%)	28/7/65	65/10/25	<b>&lt;0.001</b>
Average pressure difference	3.7±3.1	3.8±3.3	0.868

**Conclusion:**

Our study concluded that PSP can be triggered by low atmospheric pressure, in accordance with the change of air pressure compared to the previous day; whereas temperature, wind speed, and humidity variables had no significant influence.

**Disclosure:** No significant relationships.



O-132

**EFFICACY OF SURGICAL SEALANTS FOR PERSISTENT AIR LEAK AFTER LUNG RESECTION: INDIVIDUAL PATIENT DATA META-ANALYSIS FROM TWO RANDOMISED TRIALS**

May Al-Sahaf, P. Perikleous, E. Belcher, H. Raubenheimer, N. Asadi, M.E. Cufari, C. Proli, S. Jordan, M. Dusmet, G. Ladas, E. Lim

*Thoracic Surgery, Royal Brompton Hospital, London, United Kingdom*

**Objectives:**

Prolonged air leak is often associated with increased length of hospital stay and recent Cochrane review failed to conclusively identify the role of surgical sealants in the management of patients with air leaks detected intra-operatively immediately after lung resection. We sought to analyse individual patient data from two randomised trials at our institution to determine the efficacy of surgical sealants on length of hospital stay.

**Methods:**

We conducted two single blind randomised controlled trials of surgical sealant (versus no sealant) after conventional management (suturing) of air leaks detected intra-operatively. From 2002 to 2005 we evaluated Bioglue and from 2005-2007 we randomised patients to either Bioglue or Vivostat. We compared results of sealants versus no sealants indirectly, and the efficacy of BioGlue versus Vivostat on post-operative length of stay compared using Kaplan Meier time to event analyses.

**Results:**

Of 154 patients participating in both trials, 27 were randomised to no sealant, 75 to BioGlue and 52 to Vivostat. No differences in time to discharge were noted as the median length of hospital stay was 7 days in each of the three arms. There was no difference in pairwise comparisons for length of stay for all 154 participants comparing sealant versus no sealant ( $p=0.722$ ), 102 participants comparing BioGlue versus no sealant ( $p=0.691$ ) and 79 participants comparing Vivostat versus no sealant ( $p=0.801$ ).

**Conclusion:**

Our results indicate no benefit from the use of the two aforementioned sealants in management of intra-operative air leak with respect to hospital stay.

**Disclosure:** No significant relationships.

## O-133

**TIETZE'S SYNDROME AND COSTOCHONDRITIS: WHEN DO THEY OCCUR? IS SURGERY REQUIRED?**

M. Boran<sup>1</sup>, Ertay Boran<sup>2</sup>

<sup>1</sup>*Thoracic Sugery, Duzce University School of Medicine, Duzce, Turkey*

<sup>2</sup>*Anesthesiology and Reanimation, Duzce University School of Medicine, Duzce, Turkey*

**Objectives:**

Idiopathic costochondritis (IC) is characterized by chest pain and costochondral junction tenderness. Tietze's syndrome (TS) resembles with IC and differs by characteristic nonsuppurative painful swelling over rib cartilages. Treatment is non specific, surgical resection has been advocated. The etiology was unclear. Patients mostly attend emegrency depatments and outpatient cardiac clinics because of chest pain. We aimed to compare IC and TS, to investigate season of diagnosis and surgical treatment ratio in our patients, considering that no publications researched such issue.

**Methods:**

We prospectively analyzed all patients with IC and TS who were diagnosed and treated in our department between 2009 and 2013. Demographics, treatments and season of diagnosis were recorded. TS group and non-TS group were compared.

**Results:**

A total of 431 consecutive IC patients and 24 TS patients) were evaluated. Non TS group: 431 patients (58% women, median age 39.0±17 .0 years. The diagnosis of IC was lowest in summer (20.6%), (p<0.001) and in September (4.2%), (p<0.001) and more frequent in winter-spring period (61.5%), (p<0.001). TS group was consisted of 24 patients (66% women, median age 34±17.2) No statistical difference was detected in gender, age, side of disease, sedimentations rate, season of diagnosis and treatment between two groups. Recurrence was more frequent in TS group (%12.2, p=0.04). The month of diagnosis, respiratory tract infection history was statistically different between two groups (p=0.04, p=0.003, respectively). All of patients were treated non-surgically; pain disappeared generally in 3 weeks (91.3%) (p=0.002) while swelling remained unchanged.

Table 1

	TS	Non TS	P
Age(median)	34.5±17.2	39.0±17.0	0.4
CRP	2.9	3.1	0.8
sedimentations rate	10	6	0.5
Gender(women)	66%	58%	0.4
Season of diagnosis (Lowest)	20.8% summer	20.6% summer	0.8
Month of diagnosis (Lowest)	0% July	3.7% september	<b>0.04</b>
Season period	winter-spring 58%	Winter-spring 59%	0.9
Side of disease(Left)	62.5%	70.8%	0.3
respiratory tract infection history (No)	91.7%	68.3%	<b>0.016</b>
Recurrence	12.2%	3.7%	<b>0.04</b>

**Conclusion:**

We found that TS and IC were more frequently seen in women and in winter-spring period and also that surgery was not required for treatment. Our demonstration of the seasonality may highlight the unclear etiology of this disease.

**Disclosure:** No significant relationships.

## O-134

**USE OF THE AQUAMANTYS® SYSTEM IN OPEN DECORTICATION FOR THORACIC EMPYEMA**

Edward J Caruana<sup>1</sup>, S. Iyer<sup>1</sup>, J. Kadlec<sup>2</sup>, A. Mani<sup>3</sup>, P. Solli<sup>1</sup>, M. Scarci<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, Papworth Hospital, Cambridge, United Kingdom*

<sup>2</sup>*Department of Thoracic Surgery, Norfolk and Norwich University Hospital, Norwich, United Kingdom*

<sup>3</sup>*Department of Thoracic Surgery, John Radcliffe Hospital, Oxford, United Kingdom*

**Objectives:**

Conventional open decortication for thoracic empyema is associated with significant perioperative morbidity. We sought to assess the impact of use of an irrigated radiofrequency sealing system (Aquamantys®) for performing this procedure.

**Methods:**

Data for 33 patients with stage III thoracic empyema who underwent either (1) conventional open decortication or (2) open decortication using the Aquamantys® system at a thoracic surgical tertiary referral centre, between April 2010 and July 2014, were retrospectively reviewed. Unpaired t test and Fisher's exact test were used for statistical analysis.

**Results:**

21 of 33 patients (63.6%) underwent decortication with Aquamantys®. There was no significant difference in gender (conventional vs Aquamantys®: 50% vs 76.2%,  $P = 0.149$ ) or age ( $52.2 \pm 12.1$  vs  $55.3 \pm 16.2$  years,  $P = 0.569$ ) between the two groups, whilst preoperative haemoglobin was higher in the conventional group ( $11.2 \pm 1.2$  vs  $10.4 \pm 1.2$  g/dL) but this did not reach statistical significance ( $P = 0.075$ ). Patients in the Aquamantys® group suffered a lower perioperative drop in their haemoglobin ( $3.1 \pm 1.5$  vs  $1.6 \pm 0.7$ ,  $P < 0.001$ ), required less blood to be transfused ( $3.0 \pm 1.3$  vs  $1.3 \pm 1.8$  units packed red cells,  $P = 0.007$ ), and had their chest drains taken out earlier ( $9.1 \pm 6.3$  vs  $4.0 \pm 3.0$  days,  $P = 0.004$ ), whilst operative time was longer ( $119.6 \pm 43.4$  vs  $177.1 \pm 83.4$ ,  $P = 0.034$ ). Postoperative hospital stay was shorter in the Aquamantys® group ( $11.2 \pm 4.5$  vs  $7.9 \pm 5.7$  days,  $P = 0.096$ ) as was the incidence of critical care admission (5 vs 2 admissions,  $P = 0.071$ ), however, these did not achieve statistical significance.

**Conclusion:**

Use of the Aquamantys® system in open decortication for thoracic empyema results in less blood loss, lower transfusion requirements, and shorter chest drain times; whilst contributing to reduced length of stay.

**Disclosure:** E.J. Caruana: Aquamantys® System (Medtronic, Minneapolis, MN, USA).

S. Iyer: Aquamantys® System (Medtronic, Minneapolis, MN, USA).

J. Kadlec: Aquamantys® System (Medtronic, Minneapolis, MN, USA).

A. Mani: Aquamantys® System (Medtronic, Minneapolis, MN, USA).

P. Solli: Aquamantys® System (Medtronic, Minneapolis, MN, USA).

M. Scarci: Aquamantys® System (Medtronic, Minneapolis, MN, USA).





O-135

## IMPACT OF INDUCTION THERAPY ON POSTOPERATIVE OUTCOME AFTER EXTRAPLEURAL PNEUMONECTOMY FOR MALIGNANT PLEURAL MESOTHELIOMA: DOES INDUCTION ACCELERATED HEMITHORACIC RADIATION INCREASE THE SURGICAL RISK?

Pierre Mordant<sup>1</sup>, K. Mcrae<sup>2</sup>, J. Cho<sup>3</sup>, S. Keshavjee<sup>1</sup>, T.K. Waddell<sup>1</sup>, R. Feld<sup>4</sup>, M. De Perrot<sup>1</sup>

<sup>1</sup>*Division of General Thoracic Surgery, Toronto General Hospital, Toronto, Canada*

<sup>2</sup>*Anesthesiology, Toronto General Hospital, Toronto, Canada*

<sup>3</sup>*Radiation Oncology, Princess Margaret Hospital, Toronto, Canada*

<sup>4</sup>*Medical Oncology, Princess Margaret Hospital, Toronto, Canada*

### Objectives:

Patients with malignant pleural mesothelioma (MPM) eligible to extrapleural pneumonectomy (EPP) may benefit from induction chemotherapy (CT) as historically described, or from induction accelerated hemithoracic intensity-modulated radiation therapy (IMRT) as a potential alternative. However, the impact of the type of induction therapy on postoperative morbidity and mortality remains unknown.

### Methods:

We set a retrospective study including every patient who underwent EPP for MPM in our institution between 01/2001 and 06/2014 (study group). Patients without induction treatment (n=7) or undergoing induction CT and IMRT (n=2) were then excluded, the remaining patients being divided according to the type of induction treatment in group 1-CT and group 2-IMRT.

### Results:

All together, 127 patients (mean age 60.9±9.3 years, males 82.6%, right side 59.0%) underwent EPP for MPM during the study period with an in-hospital mortality of 4% (n=5). The histology was epithelioid in 94 (74.0%) and biphasic in 31 (24.4%) patients. The pathologic stage was III in 65 (51.1%) and IV in 50 (39.3%) patients. From this study group, 64 patients were included in group 1-CT and 54 patients were included in group 2-IMRT. As compared to group 1-CT, group 2-IMRT was characterized by older patients (59.37±9.23 vs. 63.1±8.46 years, p=0.0218), more right-sided resections (46.8% vs. 77.7%, p=0.0011), more advanced disease (pathologic stage IV: 28.1% vs. 55.5%, p=0.0145), less red blood cells transfusions (4.9±3.2 vs. 2.7±2.5 packs, p<0.001), less plasma or platelets transfusions (31.2% vs. 5.5%, p=0.0072) and similar rate of major complications (29.6% vs. 37.9%, p=0.5162). The in-hospital mortality rate was 6.25% in group 1-CT (n=4) and null in group 2-RT (p=0.1743).

### Conclusion:

In this large monocentric series of EPP for MPM, the recent switch from induction CT to induction IMRT allowed the resection of older patients with more advanced tumors, less transfusion requirements, comparable postoperative morbidity and no postoperative mortality.

**Disclosure:** No significant relationships.

## O-136

**ASSESSMENT OF LONG-TERM OUTCOME OF DIFFERENT RIB FRACTURE STABILIZATION METHODS FOR PATIENTS WITH CRANIOTHORACIC TRAUMA**

Volodymyr Pimakhov

*Surgery № 2, SE "Dnepropetrovsk Medical Academy of Ministry of health of Ukraine", Dnepropetrovsk, Ukraine***Objectives:**

To compare long-term outcome of different rib fracture stabilization methods for patients with combined craniothoracic trauma.

**Methods:**

We have analyzed long-term outcome of 57 patients (2010-2014) with combined thoracic and brain trauma, along with 3<sup>rd</sup> or 4<sup>th</sup> degree of rib fracture according to Oxford classification. Trauma severity varied between 10 and 34 points ISS (median — 19.1±6.2). 27 patients (I group) underwent surgical chest stabilizations. Our own extrapleural osteosynthesis method was performed in 16 of these cases, intramedullar osteosynthesis with Kirshner wires was provided for other 11 victims. For II group of 30 injured person's internal stabilization by means of artificial lung ventilation was used. Main spirometric marks such as total lung capacity (TLC), forced expiration volume in 1<sup>st</sup> second (FEV1), Tiffno index (iT) as well as bone callous ripeness in multidimensional chest X-ray and Health Related Quality of Life (HRQOL). Index were evaluated 1, 3 and 6 month after the trauma.

**Results:**

By the 30<sup>th</sup> day, rib callous had been formed in 26 (96.3%) cases of I group, and just for 19 (63.3%) persons of II group. All patients of I group had had full rib consolidation by 90 and 180 day, while in II group it was fixed in 23 (76.7%) and 28 (93.3%) cases respectively. The results of lung ventilation function and HRQOL assesment in different terms after the trauma are shown in the table below.

	30 days after trauma		90 days after trauma		180 days after trauma	
	I group (n=27)	II group (n=30)	I group (n=27)	II group (n=30)	I group (n=27)	II group (n=30)
TLC, %	81.1±3.2	58.2±5.8	88.6±2.9	63.4±4.9	94.1±1.4	71.4±4.7
FEV(1), %	80.9±2.7	64.6±6.1	89.9±2.2	66.7±5.4	93.3±1.9	73.9±5.1
iT, %	93.5±3.4	84.6±3.8	94.3±2.8	89.6±3.1	96.9±1.7	90.1±2.3
HRQOL	0.58±0.11	0.36±0.21	0.74±0.09	0.44±0.19	0.91±0.11	0.61±0.18

**Conclusion:**

The use of surgical stabilization methods permitted to speed up rib consolidation process, to achieve fast lung ventilation indexes normalization and to improve on HRQOL 0.3 points.

**Disclosure:** No significant relationships.



O-137

**REGULATED DRAINAGE REDUCES THE INCIDENCE OF RECURRENCE AFTER UNIPORTAL VATS BULLECTOMY FOR PRIMARY SPONTANEOUS PNEUMOTHORAX: A PROPENSITY CASE MATCHED COMPARISON VERSUS UNREGULATED DRAINAGE**

Cecilia Pompili<sup>1</sup>, R. Hristova<sup>1</sup>, F. Xiumè<sup>2</sup>, M. Patella<sup>1</sup>, R. Milton<sup>1</sup>, M. Salati<sup>2</sup>, A. Sandri<sup>1</sup>, K. Papagiannopoulos<sup>1</sup>, A. Brunelli<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

<sup>2</sup>*Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy*

**Objectives:**

To compare the recurrence rate of primary spontaneous pneumothorax (PSP) after uniportal VATS bullectomy and mechanical pleurodesis in patients managed with regulating pressure drainage system compared to those managed with traditional one.

**Methods:**

Retrospective propensity score case-matched analysis on 174 consecutive patients submitted to uniportal VATS bullectomy and mechanical pleural abrasion (2007-2013) in two centers. Definition of recurrence: recurrent PSP requiring new treatment (i.e. aspiration, chest tube reinsertion, reoperation) within 12 months from the operation. All patients were managed with a single 24Ch chest tube. Group 1 (106 patients): Tube connected to traditional device (T) maintained on wall suction (-20 cmH<sub>2</sub>O) for 48 hours. Group 2 (68 patients): tube connected to regulating pressure device (R) set at -20 cmH<sub>2</sub>O for 48 hours. Chest tube removal criteria: No air leak (no bubbling or air flow < 20 ml/min for at least 8 hours) and pleural effusion < 200 ml/day. Propensity score case-matching analysis was performed using the following variables: age, gender, height, weight, side of operation, dystrophic score, length of staple parenchyma.

**Results:**

The 2 groups of 68 pairs were well-matched for baseline and surgical characteristics. Patients of group 2 (R) showed a significantly lower incidence of recurrence rate compared to matched counterparts (T) (3, 4.4% vs. 10, 14%, p=0.04). There were no differences in persistent air leak incidence, chest tube duration or hospital stay between the groups. Group 2 had a higher 48 hours output of pleural effusion compared to group 1 (p<0.0001).

**Conclusion:**

By stabilizing the pleural pressure at the pre-set values, novel regulating pressure devices may enhance pleurodesis leading to a reduced incidence of PSP recurrences after uniportal VATS bullectomy and pleural abrasion.

Table 1: Secondary Endpoints.

<b>Variables</b>	<b>Thopaz</b>	<b>Traditional</b>	<b>p-values</b>
PAL>5 days (n,%)	6 (9)	4 (6)	0.5
LOS (days)	4.4 (2.0)	3.9 (2.2)	0.2
Residual PNx at X ray before chest tube removal (cm)	0.8 (1.2)	0.95 (0.7)	0.4
Pleural effusion 48 hours (ml)	310 (219)	132 (129)	<0.001
Chest tube duration (days)	3.6 (2.2)	3.9 (3.1)	0.7

**Disclosure:** K. Papagiannopoulos: Medela Healthcare consultancy agreement.

O-138

**ARE WE OVER-EXTENDED IN THE SURGICAL TREATMENT OF MESOTHELIOMA? THE TALE OF THE UNNECESSARY PHRENECTOMY**

Annabel Sharkey, A. Nakas, S. Tenconi, D. Waller  
*Thoracic Surgery, Glenfield Hospital, Leicester; United Kingdom*

**Objectives:**

Macroscopic complete resection with lung preservation is the objective of radical management of pleural mesothelioma (MPM). Total removal of visceral and parietal pleura (pleurectomy/decortication) almost invariably proceeds to an extended pleurectomy/decortication (EPD) to ensure MCR. We suspected this may not always be necessary.

**Methods:**

We reviewed 314 patients, 85.9% male, median age 62 years (range 14-81) undergoing radical surgery for MPM from 1999-2014, by either EPD or extrapleural pneumonectomy. The extent of diaphragmatic muscle involvement was recorded from postoperative pathology. Patients were divided into 3 groups; no involvement, non-transmural, and transmural diaphragmatic invasion.

**Results:**

213 (68%) patients underwent EPD, 235 (75%) had epithelioid disease and 57% were node positive. In 119 patients (38%) there was no involvement of the diaphragm.

Diaphragmatic Involvement	Group	n	Median Survival (months)	p	n	Disease Free Interval	p
None	1	119	16.9		88	17.4	
Non-transmural	2	161	11.8		122	10.4	
Transmural	3	34	9.3	0.029	28	8.2	0.027

There was no difference between the 3 groups in terms of age, cell type, laterality, neo-adjuvant chemotherapy and operation. There was a higher degree of diaphragm involvement in females (p=0.004), and in patients with positive lymph nodes (p=0.005). The incidence of abdominal disease progression was 10.2%. There was no correlation with degree of diaphragmatic invasion  $\rho=0.049$ ,  $p=0.547$ . Overall survival of those with abdominal progression was similar to those with progression elsewhere: 13.0 months vs 16.1 months (p=0.791), and with those with no progression (16.0 months p=0.422). There was no difference in survival when stratified by diaphragmatic involvement p=0.997.

**Conclusion:**

In our cohort, there was no evidence of diaphragmatic invasion in over 30% of patients. It may be therefore unnecessary to resect the diaphragm in all cases, and a pleurectomy-decortication may suffice. However there is an unknown risk of R2 resection which would prejudice survival. Nevertheless, we have failed to find evidence that peritoneal disease progression affects overall survival following radical management. This may allay the fear of ‘unnecessary’ phrenectomy.

**Disclosure:** No significant relationships.

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**TUESDAY, 2 JUNE 2015****15:30 - 17:30****ESTS-STS JOINT SESSION****F-139****LYMPH NODE DISSECTION IN SURGERY FOR LUNG CANCER:  
COMPARISON OF OPEN VS. VIDEO-ASSISTED VS. ROBOTIC APPROACHES**

A. Toker, Mehmet Oğuzhan Özyurtkan, Ö. Demirhan, K. Ayalp, E. Kaba, E. Uyumaz  
*Thoracic Surgery, Istanbul Bilim University and Group Florence Nightingale, Istanbul, Turkey*

**Objectives:**

The aim of this study is to assess the feasibility of mediastinal (N2-level) and hilar/interlobar (N1-level) lymph node dissection by robotic approach, and compare it with open and video-assisted approaches.

**Methods:**

All patients who underwent anatomic pulmonary resections for lung cancer between October 2011 and December 2014 were retrospectively investigated, and those with pathologically proven N2 disease were excluded. The remaining 170 patients were grouped into three according to the operative approach: GI (thoracotomy, n=60), GII (video-assisted, n=44), GIII (robotic, n=66). The results were compared using ANOVA test to define the advantageous approach in (1) the dissection of overall lymph node stations, (2) the number of dissected lymph nodes, and (3) the number of lymph nodes dissected from specific stations, whether N1- or N2-level.

**Results:**

The mean number of the dissected mediastinal lymph node station was higher in GI (3.7 vs 3.2 vs 3.1, respectively,  $p<0.05$ ). With robotic approach, significantly more N1-level lymph nodes (3.0 vs 3.1 vs 3.8, respectively,  $p<0.05$ ) and insignificantly more N2-level lymph nodes (8.1 vs 7.5 vs 8.8, respectively,  $p>0.05$ ) can be obtained in both right and left-sided resections. Compared to video-assisted approach, robotic approach was advantageous in the resection of upper and lower paratracheal lymph nodes (2.6 vs 4.0, respectively,  $p<0.05$ ), and of esophageal and pulmonary ligament lymph nodes (0.9 vs 1.7, respectively,  $p<0.05$ ).

**Conclusion:**

Thoracotomy is the advantageous approach in accessing to more mediastinal lymph node stations. But robotic approach is superior in dissecting more N1-level lymph nodes compared to the other approaches, and more upper and lower paratracheal lymph nodes compared to video-assisted approach. Lymph node dissection with robotic surgery could be considered as an oncologically trustable procedure.

**Disclosure:** No significant relationships.



F-140

**USE OF THE DELPHI PROCESS TO ACHIEVE CONSENSUS IN DEVELOPING A RANDOMIZED CONTROLLED TRIAL**

Laura Donahoe<sup>1</sup>, J. Deslauriers<sup>2</sup>, T.K. Waddell<sup>1</sup>, G.E. Darling<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University of Toronto, Toronto, Canada*

<sup>2</sup>*Thoracic Surgery, Université Laval, Quebec, Canada*

**Objectives:**

Currently, there is no evidence to show that intensive follow-up after resection of non-small cell lung cancer (NSCLC) improves survival. An attempt to develop a protocol for a randomized trial of standard follow-up for resected NSCLC failed to achieve consensus on the two arms of the proposed trial at a face-to-face meeting of Canadian Thoracic Surgeons. The purpose of this study was to use a Delphi method to establish the standard arm for the study.

**Methods:**

All thoracic surgeons in Canada were asked to complete three electronic surveys. The first round (R1) involved questions about follow-up practices (i.e. time intervals, imaging). Round two (R2) collated the responses from R1, which were used to suggest standard and intensive follow-up protocols for R3. Round three (R3) presented the final protocols to determine willingness of surgeons to enroll patients in the RCT using these study arms.

**Results:**

48 participants (64% of Canadian thoracic surgeons) responded in R1. All 48 followed patients after NSCLC resection, and felt establishing a protocol through an RCT was worthwhile. A standard protocol was used by 40 surgeons (83%) and 30 (62.5%) used the same protocol for all stages. Most respondents used CT in follow-up, and only 1 used MRI/CT brain or PET scan. No respondents used bone scans. Respondents felt it was important to detect asymptomatic locoregional recurrence (44; 91.7%) and metastatic disease (30; 62.5%). Only 29 participants (37%) responded in R2 and R3. Using feedback from R2, the final protocols were presented in R3 (see Table 1).

Table 1		
Months	Standard	Intensive
3	CXR	CXR
6	CXR	SDCT chest/abdomen
9	CXR	CXR
12	LDCT chest	SDCT chest/abdomen, MRI Brain, PET-CT
15	CXR	CXR
18	CXR	SDCT chest/abdomen
21	CXR	CXR
24	LDCT chest	SDCT chest/abdomen, MRI Brain, PET-CT
30	CXR	CXR
36	LDCT chest	SDCT chest/abdomen
48	LDCT chest	SDCT chest/abdomen
60	LDCT chest	SDCT chest/abdomen, MRI Brain, PET-CT

CXR – chest X-ray; LDCT – low-dose computed tomography; SDCT – standard dose computed tomography; MRI – magnetic resonance imaging; PET-CT – positron emission tomography – computed tomography.

**Conclusion:**

The modified Delphi method was successfully used to develop standard and intensive follow-up arms for a RCT to develop a follow-up protocol for NSCLC.

**Disclosure:** No significant relationships.





F-141

## PROPENSITY SCORE MATCHING ANALYSIS OF HYBRID VIDEO-ASSISTED THORACOSCOPIC SURGERY AND THORACOSCOPIC LOBECTOMY FOR CLINICAL STAGE I LUNG CANCER

Hisashi Iwata, K. Shirahashi, H. Yamamoto, H. Takemura

*General and Cardiothoracic Surgery, Graduate School of Medicine, Gifu University, Gifu, Japan*

### Objectives:

Video-assisted thoracoscopic surgery (VATS) lobectomy is classified into hybrid VATS (direct and video vision, ref. Okada et al. CHEST2005; 128:2696–2701) and thoracoscopic VATS (only video vision). In this study, hybrid VATS was compared with thoracoscopic VATS for clinical stage I lung cancer using propensity score matching analysis.

### Methods:

Hybrid and thoracoscopic VATS were performed in 178 and 76 patients, respectively. Propensity scores were calculated using logistic regression analysis, and matched within score  $\pm 0.03$  for age, sex, size of tumor, FDG-PET SUV value, CEA, clinical stage, pathological stage and histology.

### Results:

In the non-matched analysis, the results for hybrid and thoracoscopic VATS, respectively, were as follows: mean age,  $69 \pm 9$  and  $66 \pm 10$  years ( $p=0.040$ ); tumor size,  $24 \pm 10$  and  $20 \pm 7$  mm ( $p=0.001$ ); FDG-PET SUV,  $5.6 \pm 4.4$  and  $3.6 \pm 3.2$  ( $p<0.001$ ); clinical stage (IA/IB), 130/48 and 69/7 ( $p=0.002$ ); pathological stage (IA/IB/IIA&IIB/IIIA&IIIB), 89/56/15/18 and 57/14/2/3 ( $p=0.003$ ); postoperative complications, 66 (37.1%) and 16 (21.1%;  $p=0.012$ ); respiratory complications, 32 (18.0%) and 6 (7.9%;  $p=0.039$ ); and 5-year survival, 77.0% and 88.8% (log-rank  $p=0.045$ ). In 57 matched cases, the results for hybrid and thoracoscopic VATS, respectively, were as follows: mean operative time,  $246 \pm 94$  and  $285 \pm 82$  min ( $p=0.031$ ); blood loss,  $90 \pm 100$  and  $74 \pm 70$  mL ( $p=0.323$ ); mean duration of drainage,  $3.7 \pm 3.1$  and  $3.1 \pm 2.3$  days ( $p=0.269$ ); postoperative complications, 22 (38.6%) and 13 (22.8%;  $p=0.068$ ); respiratory complications, 15 (26.3%) and 4 (7.0%;  $p=0.006$ ); respiratory complications without prolonged air leakage, 8 (14.0%) and 3 (5.2%;  $p=0.113$ ); and 5-year survival, 74.8% and 95.4% (log-rank  $p=0.096$ ).

### Conclusion:

On propensity score matching, hybrid VATS showed shorter operative time and similar outcomes compared to thoracoscopic lobectomy for clinical stage I lung cancer.

**Disclosure:** No significant relationships.

F-142

**SURGICAL APPROACHES FOR EN-BLOC RESECTION OF MALIGNANCIES INVOLVING THE THORACIC SPINE**

Abel Gomez-Caro, M. Glorion, D. Fabre, S. Mussot, C. Court, G. Missenard, P. Dartevelle, E. Fadel  
*Vascular and Thoracic Surgery Department, Centre Chirurgical Marie Lannelonge, Le Plessis Robinson, France*

**Objectives:**

To establish standardized surgical approaches to en-bloc resection of tumors involving thoracic spine (TS).

**Methods:**

From 1997 to 2013, all patients who underwent at least one-level, en-bloc vertebral resection with curative intention at our hospital were included. Different approaches were used, according to tumor location: cervicothoracic incision combined with posterior approach for upper TS vertebral stabilization (UTS; T1-T4), thoracotomy or VATS with posterior approach for middle TS (MTS; T5-T10), and thoracolumbar approach (TLA) for lower TS (LTS; T11-L2).

**Results:**

The 112 patients (74 men; mean age, 45 (range, 6-77) years had the following indications for surgery: NSCLC involving the spine (n=62, 55.4%), primary spine sarcoma (n=36, 32.1%), vertebral metastases (n=14, 12.5%). Surgical approach was UTS (n=73, 65.3%), MTS (n=33, 29.3%; VATS in 11 patients), or TLS (n=6; 5.4%). Complete resection (R0) was achieved in 103(92%) cases. Mean number of vertebrae resected was 2.68 (range, 1-5). Mortality was 3.6% (4 patients). Major complications were observed in 34% and minor complications in 45% of patients. Reoperation was needed in 16 patients (bleeding, n=4; cerebrospinal fluid leak, n=3; wound infection, n=3; osteosynthesis-material infection, n=3; pulmonary embolectomy, n=2; chylothorax, n=1). UTS indicated risk of postoperative mortality, recurrent paralysis, difficult weaning, long hospital stay (p<0.05), and both UTS and MTS a risk of pulmonary infection and sputum retention (p<0.05). Mean length of mechanical ventilation and hospital stay was 13 (range, 1-90) and 29 (range, 2-106) days, respectively. Mean follow-up was 44 (range, 1-216) months. Five-year survival was 57% overall, and significantly better in primary spine (71%) than NSCLC tumors (33%) and spinal metastases (43%) (p<0.006). Univariate and multivariate Cox analyses showed significantly better results in R0 (p<0.006) and primary spine tumors (p<0.05).

**Conclusion:**

With the appropriate surgical approach, en-bloc resection of tumors involving the TS can be safely performed, with excellent outcomes unreachable by others conventional therapies.

**Disclosure:** No significant relationships.

**TUESDAY, 2 JUNE 2015****16:00 - 17:30****SESSION XVI: MITIG VATS SESSION****F-143****THORACOSCOPIC SURGERY VERSUS OPEN SURGERY FOR LUNG METASTASES OF COLO-RECTAL CANCER: A MULTI-INSTITUTIONAL RETROSPECTIVE ANALYSIS USING PROPENSITY SCORE ADJUSTMENT**

Tomohiro Murakawa<sup>1</sup>, H. Sato<sup>2</sup>, S. Okumura<sup>3</sup>, J. Nakajima<sup>1</sup>, H. Horio<sup>4</sup>, Y. Ozeki<sup>5</sup>, H. Asamura<sup>6</sup>, N. Ikeda<sup>7</sup>, Y. Hata<sup>8</sup>, H. Matsuguma<sup>9</sup>, I. Yoshino<sup>10</sup>, M. Chida<sup>11</sup>, M. Nakayama<sup>12</sup>, T. Iizasa<sup>13</sup>, M. Okumura<sup>14</sup>, S. Shiono<sup>15</sup>, R. Kato<sup>16</sup>, T. Iida<sup>17</sup>, N. Matsutani<sup>18</sup>, Y. Sakao<sup>19</sup>, K. Funai<sup>20</sup>, K. Suda<sup>21</sup>, H. Akiyama<sup>22</sup>, S. Sugiyama<sup>23</sup>, N. Kanauchi<sup>24</sup>, Y. Shiraishi<sup>25</sup>, M. Kawamura<sup>18</sup>

<sup>1</sup>*Department of Thoracic Surgery, University of Tokyo, Tokyo, Japan*

<sup>2</sup>*Department of Health Policy And Technology Assessment, National Institute of Public Health, Saitama, Japan*

<sup>3</sup>*Department of Thoracic Surgical Oncology, Cancer Institute Hospital, Japanese Foundation for Cancer Research, Tokyo, Japan*

<sup>4</sup>*Department of Thoracic Surgery, Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital, Tokyo, Japan*

<sup>5</sup>*Department of Thoracic Surgery, National Defense Medical College, Saitama, Japan*

<sup>6</sup>*Department of General Thoracic Surgery, Keio University School of Medicine, Tokyo, Japan*

<sup>7</sup>*Department of Thoracic Surgery, Tokyo Medical University, Tokyo, Japan*

<sup>8</sup>*Division of Chest Surgery, Department of Surgery, Toho University School of Medicine, Tokyo, Japan*

<sup>9</sup>*Division of Thoracic Surgery, Tochigi Cancer Center, Tochigi, Japan*

<sup>10</sup>*Department of General Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan*

<sup>11</sup>*Department of General Thoracic Surgery, Dokkyo Medical University, Tochigi, Japan*

<sup>12</sup>*Department of General Thoracic Surgery, Saitama Medical Center, Saitama, Japan*

<sup>13</sup>*Department of Thoracic Surgery, Chiba Cancer Center, Chiba, Japan*

<sup>14</sup>*Department of General Thoracic Surgery, Osaka University Graduate School of Medicine, Osaka, Japan*

<sup>15</sup>*Department of Thoracic Surgery, Yamagata Prefectural Central Hospital, Yamagata, Japan*

<sup>16</sup>*Department of General Thoracic Surgery, National Hospital Organization Tokyo Medical Center, Tokyo, Japan*

<sup>17</sup>*Department of Thoracic Surgery, Kimitsu Central Hospital, Chiba, Japan*

<sup>18</sup>*Department of Surgery, Teikyo University School of Medicine, Tokyo, Japan*

<sup>19</sup>*Department of Thoracic Surgery, Aichi Cancer Center Hospital, Aichi, Japan*

<sup>20</sup>*First Department of Surgery, Hamamatsu University School of Medicine, Shizuoka, Japan*

<sup>21</sup>*Department of Thoracic Surgery, Nagaoka Chuo General Hospital, Niigata, Japan*

<sup>22</sup>*Department of Thoracic Surgery, Saitama Cancer Center, Saitama, Japan*

<sup>23</sup>*Respiratory Department, Tomei Atsugi Hospital, Kanagawa, Japan*

<sup>24</sup>*Department of General Thoracic Surgery, Nihonkai General Hospital, Yamagata, Japan,*

<sup>25</sup>*Section of Chest Surgery, Fukujiji Hospital, Tokyo, Japan*

### **Objectives:**

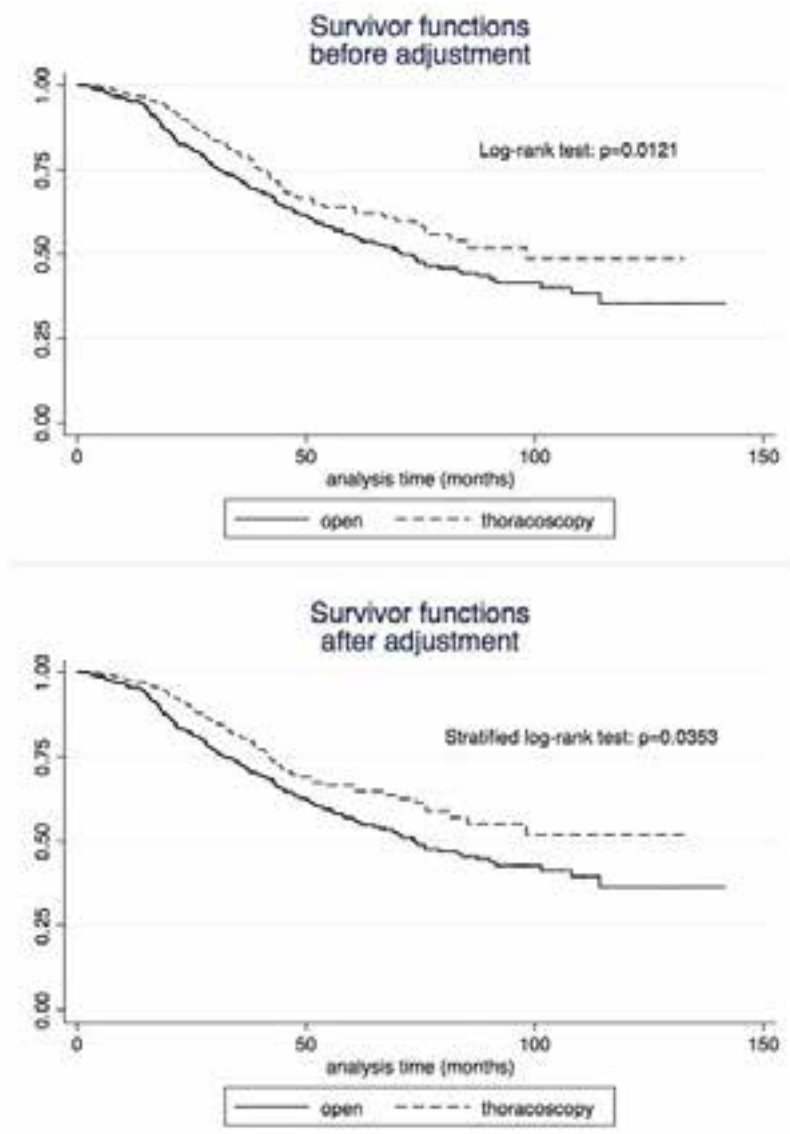
Thoracoscopic surgery for lung metastasectomy remains controversial. The aim of this study was to determine the efficacy of thoracoscopic surgery for lung metastasectomy.

### **Methods:**

This was a multi-institutional retrospective study that included 1047 patients who had undergone lung metastasectomy for colo-rectal cancer from 1999 to 2014. Prognostic factors of overall survival were compared between the thoracoscopic group and the open thoracotomy group using the multivariate cox proportional hazard model. The propensity score, calculated using the pre-operative covariates including era of lung surgery, was used as a covariate. A stepwise backward elimination method with a probability level of 0.05 was used to select the most powerful sets of outcome predictors. The validity of the proportional hazards assumption was examined using Schoenfeld residuals. The difference between radiological tumor number and resected tumor number ( $\Delta_{num}$ ) was also evaluated.

### **Results:**

The c-statistics and the p-value of the Hosmer-Lemeshow chi-square of the propensity score model were 0.7149 and 0.1579, respectively. After adjusting for the propensity score, the thoracoscopy group had a better survival rate than the open group (stratified log-rank test:  $p=0.0353$ ). After adjusting for the propensity score, the most powerful predictive model for overall survival was one that combined thoracoscopy (HR: 0.508, 95% CI: 0.284-0.908,  $p=0.022$ ) and anatomical resection (HR: 1.43, 95% CI: 1.088-1.876,  $p=0.010$ ). Before adjusting for the propensity score,  $\Delta_{num}$  was significantly greater in the open group than in the thoracoscopy group (thoracoscopy: 0.06, open: 0.33,  $p=0.001$ ); however, after adjustment there was no difference in  $\Delta_{num}$  (thoracoscopy: 0.04, open: 0.19,  $p=0.114$ ).



**Conclusion:**

Thoracoscopic metastasectomy was not shown to have a negative impact on overall survival in this analysis. The thoracoscopic approach may be an acceptable option for resection of pulmonary metastases in terms of tumor identification and survival outcome.

**Disclosure:** No significant relationships.

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**APPLICATION OF A FAST TRACK SURGERY PROTOCOL FOR VIDEO-ASSISTED THORACOSCOPIC THYMECTOMY IN NON-THYMOMATOUS MYASTHENIA GRAVIS: A CASE-CONTROL STUDY**

Dazhi Pang, J. Li, Q. Luo, Y. Lihua, A. Sihoe

*Department of Surgery, University of Hong Kong Shenzhen Hospital, Shenzhen, China*

**Objectives:**

The use of Fast Track Surgery (FTS) management has rarely been assessed in the treatment of Non-thymomatous Myasthenia Gravis (NTMG) using Video Assisted Thoracic Surgery (VATS).

**Methods:**

FTS management was applied in 68 consecutive patients receiving VATS Thymectomy for NTMG. Our FTS protocol included: maintenance of each patient's original anti-cholinesterase and steroid therapy perioperatively; no plasmapheresis or immunoglobulin therapy pre-operatively; avoidance or minimization of central lines, chest tubes and ICU stays post-operatively; and specific management of post-op respiratory difficulties without 'knee-jerk' assumption of myasthenic crisis. These patients were matched for multiple demographic and clinical variables with 68 similar patients from a historical cohort (VATS for NTMG but no FTS management) and clinical outcomes were compared.

**Results:**

Complications occurred in 9 patients (13.2%) in the FTS and 13 patients (19.1%) in the Control groups ( $P=0.35$ ). Specifically, 9 patients (13.2%) in the FTS group and 8 patients (11.7%) in the Control group ( $P=0.79$ ) experienced respiratory difficulties in the post-op period. In the 9 FTS patients, the cause of the dyspnea was found to be sputum retention and the patients responded to clearance of the sputum plus muscarinic cholinoreceptor agonist therapy. In none of these patient did myasthenic crisis develop, or was ICU re-admission or ventilatory support required. The mean initial post-operative ICU stay durations in the FTS and Control groups were  $1.6\pm 2.1$  hours versus  $37.1\pm 16.3$  hours respectively ( $P=1.3E-17$ ). The mean chest tube durations were  $0.7\pm 1.3$  hours versus  $31.1\pm 16.3$  hours respectively ( $P=6.3E-34$ ). The mean post-operative lengths of stay were  $3.5\pm 0.8$  days versus  $7.6\pm 1.7$  days respectively ( $P=2.9E-19$ ). The mean total expenses of the hospital stay were US\$ 2263.1 $\pm$ 301.3 versus US\$ 5116.3 $\pm$ 2585.1 respectively ( $P=2.1E-13$ ).

**Conclusion:**

Use of an FTS protocol after VATS for NTMG is safe and may complement VATS in expediting patient recovery. Sputum retention should be carefully distinguished from myasthenic crisis after surgery, and treated accordingly.

**Disclosure:** No significant relationships.



F-145

**PERIOPERATIVE OUTCOMES AFTER THORACOSCOPIC AND OPEN TRANSTHORACIC ESOPHAGECTOMY FOR CANCER**

C S Pramesh, G. Karimundackal, S. Jiwnani

*Thoracic Surgery and Surgical Oncology, Tata Memorial Centre, Mumbai, India***Objectives:**

Surgery for esophageal cancer is formidable and associated with considerable postoperative morbidity. Several strategies have been attempted to decrease morbidity after esophageal resection including enhanced recovery programmes, concentration of surgery in high-volume centres and minimally invasive surgical approaches. We compared the radicality of surgery, postoperative morbidity and mortality after thoracoscopic and open transthoracic esophagectomy for cancer.

**Methods:**

We performed a retrospective analysis of a prospectively maintained database of esophageal resections for cancer done at a tertiary referral cancer centre between Oct 2003 and Dec 2014. Consecutive patients who underwent either a thoracoscopic or an open transthoracic esophagectomy (TTE) were included in the study. The operative time, blood loss, resection status, lymph node yield, postoperative morbidity and mortality after surgery were recorded in a standardized format and compared between the two groups. Categorical data were analysed using the chi square test and numeric data using the Student t test. A p value of 0.05 was considered statistically significant and no adjustment was made for multiple comparisons.

**Results:**

A total of 1939 patients were operated for esophageal cancer between 1<sup>st</sup> October 2003 and 31<sup>st</sup> Dec 2014. 505 patients who underwent thoracoscopic and 879 patients who underwent open TTE were included in the study. Comparison between the two groups on the different variables are shown in the table below.

Variables	Thoracoscopic (n=505)	Open (n=879)	p value
Operative time	5.26	5.12	0.089
Blood loss	574	698	0.000
Lymph node yield	27.2	28.7	0.096
Pulmonary complications	22.8%	27.6%	0.043
Postop morbidity (major)	23.6%	27.2%	0.351
Mortality	5.3%	6.9%	0.215

**Conclusion:**

Thoracoscopic esophagectomy is feasible, with significant reduction in postoperative pulmonary complications. Randomized trials comparing the two procedures will answer the question of longterm oncological outcomes for esophageal cancer.

**Disclosure:** No significant relationships.

## F-146

**HIGH RISK PATIENTS AND POSTOPERATIVE COMPLICATIONS FOLLOWING VATS LOBECTOMY. A CASE MATCHED COMPARISON WITH LOWER RISK COUNTERPARTS**

Alberto Sandri, K. Papagiannopoulos, R. Milton, N. Chaudhuri, M. Kefaloyannis, C. Pompili, V. Tentzeris, A. Brunelli

*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

To assess the postoperative incidence of major complications in high-risk patients following VATS lobectomy for lung cancer compared to lower-risk counterparts.

**Methods:**

A retrospective analysis on prospectively collected data of 346 consecutive patients subjected to VATS lobectomy (August 2012–October 2014) was performed. Patients were defined as high-risk if one or more of the following characteristics were present: age >75, FEV1 <50%, DLCO <50%, history of coronary artery disease. Severity of complications was graded using the Thoracic Morbidity and Mortality (TMM) score; major complications were defined if TMM score was greater than 2. Propensity score was used to match high-risk patients with lower risk counterparts in order to minimize the influence of other confounders on outcome. The following variables were used to construct the propensity score: gender, side of operation, Body Mass Index, ASA score, ECOG Score, Charlson Comorbidity Index, number of functioning segments resected.

**Results:**

The high risk group consisted of 141 patients (age >75: 84 Pts.; FEV1 <50: 14 Pts.; DLCO <50: 25 Pts.; history of CAD: 37 Pts.). Propensity score yielded two groups of 135 patients (high-risk vs. low-risk) well matched for several baseline characteristics except for a lower performance status in the higher risk group. Compared to low-risk counterparts, high-risk patients had a higher incidence of major total complications (28 cases, 21% vs. 14 cases, 10%; p=0.02) and major cardiopulmonary complications (12 cases, 9% vs. 3 cases, 2%; p=0.02). Postoperative stay was 3 days longer in high-risk patients (8.6 days vs. 5.5 days, p=0.003). 30 days or in-hospital mortality rates were not different between the two groups (2 cases, 1.5% vs. 3 cases, 2.2%, p=0.7).

**Conclusion:**

The incidence of major complications after VATS lobectomy in high-risk patients is not negligible. This information can be used when discussing surgical risk with the patient during preoperative counselling.

**Disclosure:** No significant relationships.





F-147

**SAFETY, REPRODUCIBILITY AND BENEFIT OF VIRTUAL-ASSISTED LUNG MAPPING IN THORACOSCOPIC SUBLOBAR LUNG RESECTION: A MULTI-CENTER STUDY IN JAPAN**

Masaaki Sato<sup>1</sup>, K. Imashimizu<sup>2</sup>, T. Kuwata<sup>3</sup>, K. Yamanashi<sup>4</sup>, K. Misawa<sup>5</sup>, M. Kobayashi<sup>6</sup>, M. Ikeda<sup>7</sup>, T. Koike<sup>8</sup>, A. Kitamura<sup>9</sup>, S. Kosaka<sup>10</sup>, K. Nagayama<sup>11</sup>, Y. Sekine<sup>12</sup>, S. Hirayama<sup>13</sup>, R. Okabe<sup>14</sup>, H. Sakai<sup>15</sup>, F. Watanabe<sup>16</sup>, H. Date<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Kyoto University Hospital, Kyoto, Japan*

<sup>2</sup>*Thoracic Surgery, Juntendo University, Tokyo, Japan*

<sup>3</sup>*Second Department of Surgery, University of Occupational and Environmental Health, Kitakyushu, Japan*

<sup>4</sup>*Thoracic Surgery, Kitano Hospital, Osaka, Japan*

<sup>5</sup>*Thoracic Surgery, Aizawa Hospital, Matsumoto, Japan*

<sup>6</sup>*Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan*

<sup>7</sup>*Thoracic Surgery, Nagara Medical Center, Gifu, Japan*

<sup>8</sup>*Thoracic and Cardiovascular Surgery, Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan*

<sup>9</sup>*Respirology, St. Luke's International Hospital, Tokyo, Japan*

<sup>10</sup>*Thoracic Surgery, Shimane Prefectural Central Hospital, Izumo, Japan*

<sup>11</sup>*Department of Thoracic Surgery, Graduate School of Medicine, the University of Tokyo, Bunkyo-ku, Tokyo, Japan*

<sup>12</sup>*Department of Thoracic Surgery, Tokyo Women's Medical University Yachiyo Medical Center, Yachiyo, Japan*

<sup>13</sup>*Thoracic Surgery, Okayama Rosai Hospital, Okayama, Japan*

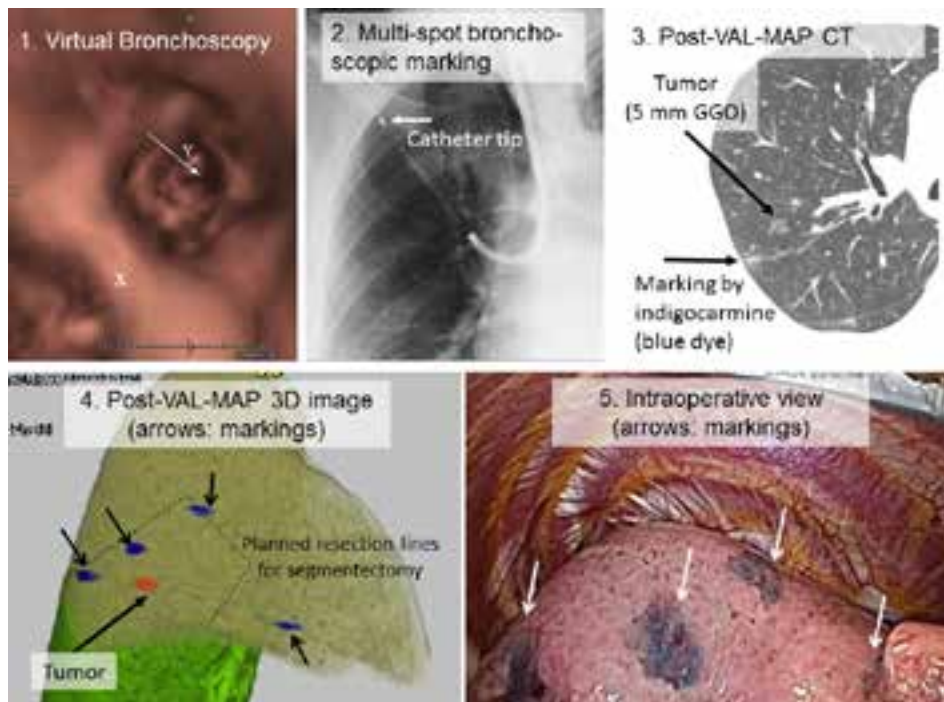
<sup>14</sup>*Thoracic Surgery, Matsue Red Cross Hospital, Matsue, Japan*

<sup>15</sup>*Thoracic Surgery, Hygo Prefectural Amagasaki Hospital, Amagasaki, Japan*

<sup>16</sup>*Thoracic Surgery, Matsusaka Municipal Hospital, Matsusaka, Japan*

**Objectives:**

Virtual-assisted lung mapping (VAL-MAP) was developed as a novel preoperative bronchoscopic multi-spot dye-marking technique utilizing 3D virtual imaging (Figure). This study's purpose was to test the safety and reproducibility of VAL-MAP performed in multiple institutions with variable settings and to identify groups of patients that benefit from VAL-MAP.



### Methods:

VAL-MAP was selected for lesions expected to be difficult to identify intraoperatively and/or for those requiring careful determination of resection margins during sublobar lung resection (wedge resection or segmentectomy). Prospectively collected data were compared between the original institution that developed VAL-MAP and 15 other medical centers that used 5 different imaging work stations. VAL-MAP's contribution to each operation was evaluated by surgeons as essential (grade A), helpful for confident resection (grade B), or unnecessary (grade C).

### Results:

In total, 1084 markings (566 in the original center; 518 in the other centers) were conducted using VAL-MAP in 294 (145; 149) patients to resect 424 (228; 196) lesions via 218 wedge resections (101; 117) and 144 segmentectomies (97; 47). The marking-identification ratio was similar between the groups (92.8%; 91.1%). Mutually complementary multiple markings enabled high successful completion of intended resections (99.6%; 98.5%). Similar complications were observed between the groups, including minor pneumothorax (4.8%; 2.7%), pneumomediastinum (0.7%; 1.3%), and alveolar hemorrhage (0.7%; 0.7%), none of which needed additional treatment. VAL-MAP's operative contribution was mostly graded as A (53.8%; 40.5%) or B (40.0%; 49.5%). The benefit of VAL-MAP was most appreciated in the resection of pure ground glass opacity lesions ( $P < 0.001$ ), and VAL-MAP even enabled resection of palpable



small tumors and/or anatomical segmentectomies with high levels of confidence.

**Conclusion:**

The present study demonstrated the safety and reproducibility of VAL-MAP in multiple centers with variable settings. The best application of VAL-MAP was found resections of pure ground glass opacity lesions. VAL-MAP enabled confident operation in most other applications.

**Disclosure:** No significant relationships.

## F-148

**RISK ADJUSTED FINANCIAL MODEL TO ESTIMATE THE COST OF A VATS LOBECTOMY PROGRAM**

Vasileios Tentzeris, A. Sandri, P. Drosos, C. Pompili, K. Papagiannopoulos, R. Milton, N. Chaudhuri, M. Kefaloyannis, A. Brunelli  
*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

To develop a clinically risk adjusted financial model to estimate the cost associated with a VATS lobectomy program.

**Methods:**

Retrospective analysis on prospectively collected data of 212 VATS lobectomy patients (August 2012-December 2013). Fixed and variable intraoperative and postoperative costs were retrieved from the Hospital Accounting Department. Baseline and surgical variables were tested for a possible association with total cost using multivariable linear regression and bootstrap analyses. Cost were calculated in GBP and expressed in Euro (EUR:GBP exchange rate 1.28).

**Results:**

In our system, the average total cost of a VATS lobectomy was €9,350 (min €6,106-max €40,831). Average intraoperative (including surgical and anaesthetic time, overhead, disposable materials) and postoperative costs (including stay in the ward, HDU or ICU and variable costs associated with management of complications) were €7,478 and €1,878, respectively. The following variables remained associated with total costs after linear regression analysis: left side lobectomy (p=0.003, bootstrap 90%), reduced DLCO (p=0.045, bootstrap 52%), diabetes (p=0.02, bootstrap 63%), COPD (p=0.03, bootstrap 59%). The following model was developed to estimate the total costs:  $10,478 + 1,112.7 \times \text{COPD} + 1,318.7 \times \text{left side lobectomy} + 1,874 \times \text{diabetes} - 28.5 \times \text{DLCO}$ . The comparison between predicted and observed costs was repeated in 1000 bootstrapped samples to verify stability of the model. The two values were not different (p>0.05) in 86% of the samples. A hypothetical patient with COPD, DLCO of 50%, diabetes and candidate to left side lobectomy would cost €5,120 more than a patient without COPD, diabetes, with a DLCO of 90% and undergoing right side lobectomy (€13,356 vs. €7,909).

**Conclusion:**

Risk adjusting financial data can help to estimate the total cost associated with VATS lobectomy based on clinical factors. This model can be used to audit the internal financial performance of a VATS lobectomy program for budgeting planning and for appropriate bundled payment arrangements.

**Disclosure:** No significant relationships.



F-149

## TRANSITIONING FROM BIPORTAL TO UNIPORTAL VATS SEGMENTECTOMY FOR CLINICAL STAGE I NON-SMALL CELL LUNG CANCER: NO COMPROMISE TO SAFETY AND IMMEDIATE OUTCOMES

Guangsuo Wang, Z. Wang

*Department of Thoracic Surgery, Shenzhen People's Hospital, Second Affiliated Hospital, Medical College of Ji'nan University, Shenzhen, China*

### Objectives:

In China, segmentectomy for early stage lung cancer in selected patients is commonly performed using a 2-port VATS approach. We assessed the feasibility of transitioning to a uniportal approach by a surgical team already experienced with the 2-port technique.

### Methods:

A retrospective, matched case-control study was performed evaluating the patient demographics and perioperative outcomes after segmentectomy by uniportal versus biportal VATS approach in clinical stage I non-small cell lung cancer at a single institution between August 2011 and November 2014.

### Results:

Review of the prospectively maintained database of thoracic surgical cases identified 111 patients (78 Biportal, 33 Uniportal) who underwent VATS segmentectomy for clinical stage I non-small cell lung cancer. Excluded were patients who had a more extensive operation (lobectomy and segmentectomy). After matching based on age, gender, presence of number of comorbid conditions and tumor size, there were 31 patients in each group. Patients had similar preoperative characteristics. The operation time, blood loss, length of hospital stay, period of thoracic drainage and number of lymph nodes dissected were not statistically different. Conversion to uniportal lobectomy occurred in 2 uniportal cases for inappropriate intersegmental division while conversion to segmentectomy by minthoracotomy in 2 biportal cases for arterial bleeding and severe adhesions. Postoperative complications occurred similarly in both groups (uniportal 3/31, 9.7% v. 2-port 4/31, 12.9%,  $p=1.00$ ). There was no mortality in either group. <sup>a</sup>Used as matching variable. <sup>b</sup>One case with one hilar lymph node metastasis, pTNM staging upgrading to T1aN1M0,IIA. <sup>c</sup>carcinoid <sup>d</sup>This research defined conversion as: a). to uniportal lobectomy for technical problems but not for intraoperative positive lymph nodes frozen section ; b). to multiport VATS or open segmentectomy.

Table 1 Clinical characteristics and perioperative outcomes of uniportal and biportal VATS segmentectomy			
Characteristics	uniportal(n=31)	2-port (n=31)	<i>p value</i>
Male/Female	18/13(58%/42%)	18/13(58%/42%)	<sup>a</sup>
Median age(ys)	55(27-80)	56(28-79)	<sup>a</sup>
Tumor size(cm)	1.3±0.4 (0.5-2.1)	1.4±0.5(0.7-2.2)	<sup>a</sup>
No. comorbidities, n (%)			<sup>a</sup>
0	12(39)	12(39)	
1	11(35)	11(35)	
2	8(26)	8(26)	
Operation time(min)	109.0±37.3 (60-240)	113.2±48.2 (45-270)	0.70
Blood loss(ml)	31.5±25.7(5-100)	38.7±63.9(5-350)	0.56
Length of hospital stay( d)	3.7± 1.5 (2-10)	4.1± 2.5(2-15)	0.45
Chest tube duration( d)	2.1± 1.2 (1-8)	2.4± 2.3(1-12)	0.52
Lymph nodes dissection			
<b>lymph nodes number</b>	11.4±3.8(6-19)	11.7±6.2(3-28)	0.82
<b>lymph nodes station</b>	5.2±1.1(5-7)	5.2±1.2(3-7)	1.00
Pathology			
<b>AAH</b>	1 (3%)	0(0%)	1.00
<b>AIS</b>	13(42%)	11(35%)	0.60
<b>MIA</b>	9(29%)	12(39%)	0.42
<b>IA</b>	7(23%) <sup>b</sup>	8(26%)	0.77
<b>Other</b>	1(3%) <sup>c</sup>	0(0%)	1.00
Complications	3 (9.7%)	4(12.9%)	1.00
<b>prolonged air leak</b>	1	2	
<b>sputum retention</b>	1	1	
<b>Arrythmia</b>	0	1	
<b>recurrent laryngeal nerve palsy</b>	1	0	
Conversion rated	2 (6.5)	2 (6.5)	0.61
<b>Inappropriate intersegmental division</b>	2	0	
<b>bleeding (calcified lymph nodes)</b>	0	1	
<b>Adhesions</b>	0	1	
Mortality	0	0	

**Conclusion:**

Uniportal VATS segmentectomy for clinical stage I non-small cell lung cancer is a technically feasible and safe procedure with immediate outcomes comparable to those of 2-port approach following a transition period of stepwise instruction.

**Disclosure:** No significant relationships.



F-150

**LONG-TERM SURVIVAL FOLLOWING OPEN VERSUS VATS LOBECTOMY AFTER INDUCTION THERAPY FOR NON-SMALL CELL LUNG CANCER**

Chi-Fu Jeffrey Yang<sup>1</sup>, R.R. Meyerhoff<sup>2</sup>, T. Singhapricha<sup>1</sup>, C.B. Toomey<sup>1</sup>, A. Kumar<sup>1</sup>, P. Speicher<sup>1</sup>, D. Harpole<sup>1</sup>, T. D'Amico<sup>1</sup>, M. Berry<sup>3</sup>

<sup>1</sup>*Surgery, Duke University, Durham, United States of America*

<sup>2</sup>*Immunology, Duke University, Durham, United States of America*

<sup>3</sup>*Cardiothoracic Surgery, Stanford University, Stanford, United States of America*

**Objectives:**

Video-assisted thoracoscopic (VATS) lobectomy is increasingly accepted for the management of early stage non-small cell lung cancer (NSCLC), but its role for locally advanced cancers has not been as well characterized. We compared outcomes of patients who received induction therapy followed by lobectomy, via VATS or thoracotomy.

**Methods:**

Perioperative complications and long-term survival of all patients with NSCLC who received induction chemotherapy (ICT) (with or without induction radiation therapy [IRT]) followed by lobectomy from 1995-2012 were assessed using multivariate logistic regression, Kaplan-Meier, and Cox proportional hazard analysis. Propensity scoring was used to assess the potential impact of selection bias.

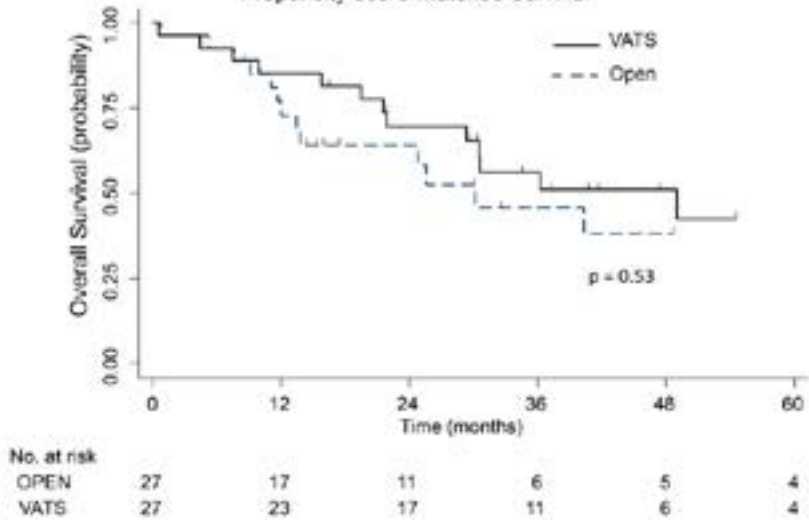
**Results:**

From 1995-2012, 273 patients met inclusion criteria and underwent lobectomy after induction chemotherapy: 70 (26%) VATS and 203 (74%) thoracotomy. An “intent-to-treat” analysis was performed. Compared to thoracotomy patients, VATS patients had higher clinical stage ( $p=0.03$ ), were older ( $p<0.001$ ), had greater body mass index ( $p=0.01$ ), and were more likely to have coronary disease ( $p=0.008$ ) and chronic obstructive pulmonary disease ( $p=0.02$ ). Induction radiation was used more commonly in thoracotomy patients (VATS 26% [ $n=18$ ] vs open 71% [ $n=145$ ],  $p<0.001$ ). Perioperative mortality was similar between the VATS (3% [ $n=2$ ]) and open (4% [ $n=8$ ]) groups ( $p=0.67$ ). Seven (2.6%) of the VATS cases were converted to thoracotomy due to difficulty in dissection from fibrotic tissue and adhesions ( $n=5$ ) or bleeding ( $n=2$ ); none of these conversions led to perioperative deaths. In univariate analysis, VATS patients had improved 3-year survival compared with thoracotomy (61% vs 43%,  $p=0.008$ ). In multivariable analysis, the VATS approach was associated with improved overall survival (hazard ratio, 0.54; 95% CI: 0.30-0.97;  $p=0.04$ ). Moreover, a propensity score-matched analysis balancing patient characteristics demonstrated that VATS approach had similar survival to an open approach (figure) ( $p=0.53$ ).

**Conclusion:**

VATS lobectomy in patients treated with induction therapy for locally advanced NSCLC is feasible and effective and does not appear to compromise oncologic outcomes.

**VATS vs Open Lobectomy Following Induction Therapy for Patients with NSCLC:  
Propensity-score-matched Survival**



**Disclosure:** C.J. Yang: Funding source: American College of Surgeons Resident Research Scholarship.

R.R. Meyerhoff: Funding support: Medical Scientist Training Program T32GM007171.

T. D'Amico: Consultant for Scanlan International, Inc.

M. Berry: Grant support included the NIH funded Cardiothoracic Surgery Trials Network, 5U01HL088953-05.





F-151

**VIDEO-ASSISTED THORACOSCOPIC LOBECTOMY: WHAT IS THE ADVANTAGE OF THREE-DIMENSIONAL OVER TWO-DIMENSIONAL THORACOSCOPE?**

Xue-Ning Yang, S. Dong, W.Z. Zhong, R.Q. Liao, Q. Nie, J. Lin, Y.L. Wu  
*Division of Surgery, Department of Pulmonary Oncology, Guangdong Lung Cancer Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou, China*

**Objectives:**

The purpose of this retrospective study was to clarify the advantages of the three-dimensional (3D) over two-dimensional (2D) thoracoscope in video assisted thoracoscopic (VATS) lobectomy. The purpose of this retrospective study was to clarify the advantages of the three-dimensional (3D) over two-dimensional (2D) thoracoscope in video assisted thoracoscopic (VATS) lobectomy. The purpose of this retrospective study was to clarify the advantages of the three-dimensional (3D) over two-dimensional (2D) thoracoscope in video assisted thoracoscopic (VATS) lobectomy.

**Methods:**

From June 2013 to July 2014, 316 consecutive patients underwent lobectomy or bi-lobectomy in our department. Including 279 cases of lung cancer, and 37 cases of metastatic or benign diseases.

**Results:**

Lobectomy was performed in 307 cases, bi-lobectomy in 7 cases, mediastinoscopy followed by lobectomy in 2 cases. Systematic mediastinal lymph node dissection was performed in 295 cases and sampling in 11 cases. 3D thoracoscope (3D TIPCAM; Karl Storz GmbH, Tuttlinger, Germany) were used in 138 cases, and 2D thoracoscope in 178 cases, the two groups were similar in tumor size, distribution of resected lobes, and demographic. Mean operative time was 150 minutes (range 60-330 minutes) for 3D thoracoscope and 176 minutes (range 75-400 minutes) for 2D thoracoscope respectively ( $p < 0.001$ ). Mean estimated blood loss was 86ml and 111ml respectively ( $p = 0.026$ ). Perioperative mortality was similar (3D 0.7%, 2D 1.1%). There were no significant differences in hospitalization, intraoperative and postoperative complications.

**Conclusion:**

Compare to 2D thoracoscope, VATS lobectomy with 3D thoracoscope have shorter operative times and less blood loss. 3D thoracoscope seems facilitate better performance in VATS lobectomy.

**Disclosure:** No significant relationships.

**WEDNESDAY, 3 JUNE 2015****08:00 - 09:00****SESSION XVII: VIDEOS III****V-152****RIGHT VIDEO ASSISTED THORACOSCOPIC COMPLETION  
PNEUMONECTOMY**Thirugnanam Agasthian*Surgical Oncology, National University of Singapore, Singapore***Objectives:**

Completion pneumonectomy is a technically challenging procedure. This is a video of completion pneumonectomy performed totally by Video-Assisted thoracoscopic surgery (VATS).

**Video description:**

Patient is a 64 year old female who underwent a right middle/lower bilobectomy through a thoracotomy in May 2014 in another institution for a T2N0M0 adenocarcinoma of the right lower lobe, Post operative course was complicated by pleural sepsis. In Oct 2014 she developed a biopsy proven recurrence at the previous staple line. As PET CT revealed no evidence of metastatic disease she underwent a right VATS completion pneumonectomy. The Vats was done through an anterior approach. A 5 mm 30 degree lens was placed at the 5<sup>th</sup> intercostal space mid axillary line, a 10 mm incision at the 7<sup>th</sup> intercostal space mid axillary line, 10mm port at the 3<sup>rd</sup> intercostal space anterior axillary line, 5 mm retraction port at the 7<sup>th</sup> intercostal space posterior axillary line. Lysis of adhesions was done. Pericardium was opened. The inferior pulmonary vein was dissected and divided intrapericardially. The azygos vein was divided. As the superior vena cava and right main pulmonary artery were very adherent to the pericardium and mediastinal pleura due to fibrosis, the right main stem bronchus was divided first. The less adherent posterior pericardium over the pulmonary artery was then opened. The remnant lung and bronchial stump was then mobilised off the subcarinal space and esophagus carefully. The pulmonary artery was then mobilized and divided. To prevent injury to the inferior pulmonary vein during mobilization of the lung from the vein extrapericardially the lower lobe pulmonary vein was restapled intrapericardially. The bronchus was closed with interrupted PDS 40 sutures. The pericardium was closed with equine pericardium. Blood lost was 700mls. Operative time was 380 minutes. Hospital stay was 5 days.

**Conclusions:**

Though challenging VATS completion pneumonectomy is technically feasible.

**Disclosure:** No significant relationships.



V-153

**LAPAROSCOPIC TRANS-DIAPHRAGMATIC LUNG WEDGE RESECTION**

Rafael Andrade, E. Podgaetz, M. Soule

*Thoracic and Foregut Surgery, University of Minnesota, Minneapolis, United States of America***Objectives:**

To describe our technique of laparoscopic trans-diaphragmatic (LTD) lung wedge resection as a potentially less painful procedure than VATS. Our focus is technique and safety.

**Video description:**

We intubate with a double-lumen tube and selectively ventilate if needed; we place the patient in a semi-lateral decubitus. We use 4 laparoscopic ports: 1. Supraumbilical, midline, 12 mm port for camera 2. Subxyphoid, midline, 12 mm port 3. 5 cm below costal margin, nipple-line, 5 mm port 4. 5 cm below costal margin, anterior axillary line (AAL), 5 mm port Initial laparoscopic portion: We make 2 small diaphragmatic openings, these openings will eventually serve to place the two 5 mm ports into the chest. We place 2 “U”-shaped stitches around each opening for traction and for eventual closure. Thoracoscopy: We advance each 5 mm port through its corresponding diaphragmatic opening into the chest, and place a 5 mm 45° scope through one of these ports for a thoracoscopic view. We insufflate with CO<sub>2</sub> (8-12 mmHg). We now have 2 trans-diaphragmatic intrathoracic ports. Next, we pull the subxyphoid port out of the peritoneal cavity and bluntly advance it retrosternally into the chest for a three-port trans-diaphragmatic approach. The lung wedge resection proceeds just as with VATS. We place the specimen in a bag and pull it out through the subxyphoid incision. We insert a chest tube through the subxyphoid port. Final laparoscopic portion: We pull both subcostal 5 mm ports into the peritoneal cavity. We close diaphragmatic openings with #2 non-absorbable, pledgeted sutures. We don't close the subxyphoid defect. Results: We have performed 5 LTD lung wedge resection cases without complications.

**Conclusions:**

Our early experience suggests that LTD lung wedge resection is feasible and safe. A future comparison with traditional VATS is necessary to establish whether LTD chest surgery is less painful than VATS.

**Disclosure:** No significant relationships.

V-154

**DOUBLE SLEEVE LOBECTOMY FOR NON-SMALL CELL LUNG CANCER LOCATED ON LEFT UPPER LOBE IN OCTOGENARIAN WITH COMBINED PULMONARY FIBROSIS AND EMPHYSEMA**

*Takeshi Matsunaga, K. Suzuki, T. Ueda, M. Fukui, K. Takamochi, S. Oh  
General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

Reconstruction of bronchus and pulmonary artery (PA) was one of the established techniques to preserve pulmonary parenchyma. Double sleeve lobectomy for octogenarian was rare.

**Video description:**

In this case, the patient was an 80 year old man, having combined pulmonary fibrosis and emphysema and chronic renal failure. And tumor which was located on left upper lobe with N1 bulky lymph node invading PA and bronchus. We had to decide whether to do surgical resection with reconstruction of bronchus and PA or best supportive care because we needed to avoid pneumonectomy and selected surgical resection. The PA and bronchus were cut to do double sleeve lobectomy because N1 bulky lymph node invading them. We performed end-to-end anastomosis of bronchus with 4-0 Prolene and PA with 6-0 Prolene. Operative time was 243 minutes.

**Conclusions:**

He discharged on post-operative day 4 because of complication of delirium, but other complications were not observed. Pathological examination confirmed complete resection.

**Disclosure:** No significant relationships.

V-155

## SINGLE PORT WITH SISL PORT DEVICE VATS RESECTION OF MEDIASTINAL MASSES

M. Scarci<sup>1</sup>, Alessandro Pardolesi<sup>2</sup>, P. Solli<sup>3</sup>

<sup>1</sup>*Department of Thoracic Surgery, Papworth Hospital, Cambridge, United Kingdom*

<sup>2</sup>*Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy*

<sup>3</sup>*Departement of Thoracic Surgery, Papworth Hospital NHS Foundation Trust Cambridge, Cambridge, United Kingdom*

### Objectives:

To present our technique of minimally invasive resection of mediastinal masses performed through a right single port 3 cm incision with SILS Port device.

### Video description:

In this video we report three different cases of minimally invasive resection of mediastinal masses; a 4cm thymoma, 5cm calcified benign mass and a small ectopic parathyroid. In all cases we performed the same surgical approach. Under general anesthesia, with double lumen intubation patient is placed in supine position. A 3cm, lateral muscle sparing incision is performed at the fifth intercostal space. The SILS Port device (Covidien) is then gently inserted through the intercostal space without ribs spreading. When the device is perfectly adherent to the skin, we start insufflating CO<sub>2</sub> with a 6l/min flow and 8mmHg pressure. We then introduce through the port a 5 mm camera, 30° lens, for mediastinal inspection. In all case we proceed dissecting the mediastinal tissue from the pericardium going up cranially exposing and isolating the anonymous veins. We always use the LigaSure device (5mm blunt 37 length, Covidien) for tissue dissection and small vessels division. At the end of the procedure we introduce a 28CH chest tube through the same incision. All patient recovered well and discharged home in first post-operative day.

### Conclusions:

Single-port thoracoscopy, for mediastinal mass resection, is not new. Our technique involves the use of a singular access device that permits the ingress of 3 or 4 instruments, together with CO<sub>2</sub> insufflation, through a single opening in the chest wall, without rib spreading. Dedicated instruments that articulate inside can be used to increase the distance between them and reach any target inside the chest. For localised lesions we felt this was not necessary. This initial experience showed that this device is “simple” and safe and facilitate mediastinal mass resection with no need of extra incisions.

**Disclosure:** No significant relationships.

## V-156

**ROBOT-ASSISTED THORACIC RESECTION OF AN EXTENDED ESOPHAGEAL LEIOMYOMA**

C. Peillon, Guillaume Philouze, J.M. Baste

*Thoracic Surgery, CHU de Rouen, Rouen, France*

**Objectives:**

Leiomyoma represent approximately 70% of all benign esophageal tumors and 10% of mesenchymal gastrointestinal tumors. In most cases, patients are asymptomatic, but others can present chest pain, dysphagia or weight loss. Even if malignization remains a rare evolution, surgery is indicated. Laparoscopy is the most common approach because of the frequency of their localization on the lower esophagus, but thoracoscopy is also commonly performed with some difficulties for big tumor. Our aim is to present the robotic approach and the bipolar use for this specific lesion.

**Video description:**

We present the case of a 58-year-old woman with no particular comorbidity, who was fortuitously diagnosed a leiomyoma on CT-scan for Guillain-Barre syndrome. A homogenous 7cm tumor was discovered on the left side of the middle esophagus with a horseshoe-shaped aspect typical of leiomyoma. The check-up was then completed by RMI and endoscopic ultrasonography which tended to confirm the diagnosis. In this video, the robot-assisted thoracic enucleation of the tumor made by a left approach shows the quality of the esophageal exposure and dissection of the tumor by the maryland bipolar. Blood loss was less than 30ml and postoperative care was uneventful. Finally, histological analysis confirmed the diagnosis of leiomyoma without malignant cells.

**Conclusions:**

Robot-assisted resection of esophageal benign tumors is a safe procedure especially for intrathoracic tumors. This technique provides a better view and easier dissection. The perfect view of the esophagus mucosa and bipolar dissection allow safer procedure. Day care surgery could then be expected for smaller lesion.

**Disclosure:** No significant relationships.



V-157

**ANATOMICAL PULMONARY SEGMENTECTOMY BY DIVIDING SEGMENTAL PLANE WITH VIDEO-ASSISTED THORACIC SURGERY**

Yasuji Terada, S. Ota, F. Gochi, T. Kono, T. Yoshimura, Y. Matsubara  
*Respiratory Disease Center, Thoracic Surgery, Kyoto Katsura Hospital, Kyoto, Japan*

**Objectives:**

The pulmonary segmental plane running between two adjacent pulmonary segments consists of a very thin layer of connective tissue through which the pulmonary vein also runs. To perform anatomically correct segmentectomy, the segmental plane needs to be divided. Our operative technique for anatomical segmentectomy involves dividing the segmental plane from the hilum to the periphery.

**Video description:**

Before the operation, the locations of vessels and bronchi are confirmed by three-dimensional CT. Four-cm mini-thoracotomy skin incision is made in the 4<sup>th</sup> or 5<sup>th</sup> intercostal space on the antero-axillary line. After complete exposure of the pulmonary artery and bronchus, the pulmonary arteries of the target segment are ligated and resected to reduce bleeding from the divided segmental plane. The segmental plane can be confirmed by dissection of the lung parenchyma from the point of divergence of the segmental bronchi to the visceral pleura using a dull-tipped forceps or suction tube. The dissection is performed bluntly with confirmation of the pulmonary vein, and the visceral pleura is divided using electrocautery. The pulmonary veins are retained on the side of the segment in which blood mainly flows out, and the thick branch crossing the plane is cut using an energy device. Bleeding from fine branches of pulmonary veins with low blood pressure can be reduced by pulling the lung upward, and hemostasis can be completed by vessel contraction and coagulation. Electrocautery is used for dividing the visceral pleura, and a stapler is used only for the pulmonary vein and bronchus. Major air leaks are closed by suturing, whereas minor leaks can be covered with coagulated blood and do not require closure.

**Conclusions:**

Anatomical segmentectomy with correct division of the segmental plane does not require hemostasis or closure of air leaks, and no fibrin glue or biomaterial sheets may be necessary.

**Disclosure:** No significant relationships.

**WEDNESDAY, 3 JUNE 2015****09:30 - 11:30****ESTS-CATS JOINT SESSION****F-158****THE REQUIREMENT OF LYMPHADENECTOMY FOR ESOPHAGEAL CARCINOMA: COUNTING THE LEAST LYMPH NODE STATIONS IS MORE APPLICABLE**Long-Qi Chen<sup>1</sup>, C. Hu<sup>2</sup>, J. Peng<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, West China Hospital of Sichuan University, Chengdu, China*<sup>2</sup>*Pathology, West China Hospital, Chengdu, China***Objectives:**

The new AJCC TNM system for esophageal cancer recommends at least 12 regional lymph nodes (LN) should be harvested in order to have an accurate N-staging and radical dissection. However, the counting of LN might be difficult or inaccurate due to the calcification, inflammation or fusion of LN themselves. The aim of this study was to investigate if using least LN stations to optimize the lymphadenectomy requirement.

**Methods:**

The clinicopathological data on patients with esophageal cancer admitted between 2007 through 2013 was reviewed. Patients with radical-intent esophagectomy with at least 12 regional lymph nodes resected were included for the analysis. The heterogeneity in numbers for lymph nodes sampling, as well as the optimal station number for lymphadenectomy were investigated.

**Results:**

Totally 1328 patients were included, with a follow-up rate of 94%, and overall 5-year survival rate of 39%. The number of LN resection ranged between 12 and 62, with a median of 19. The LN number varied mostly in the following stations: Group 1 (1-26), Group 2 (1-22), Group 4 (1-18), Group 7 (1-29), Group 8 (1-18) and Group 17 (1-24). Log-rank analysis demonstrated that the cut-point for LN stations number between <7 and  $\geq 7$  revealing a most significant survival difference (36.2% vs. 47.4%;  $\chi^2=8.823, P=0.003$ ).

**Conclusion:**

The requirement of removal at least 7 LN stations is better than least 12 lymph nodes themselves for a radical lymphadenectomy and an accurate N staging for esophageal carcinoma.

**Disclosure:** No significant relationships.





F-159

**MAY SKIP N2 METASTASIS OF NON-SMALL CELL LUNG CANCER BE CONSIDERED IN THE GROUP OF N1 DISEASE?**

Liang Xue, Q. Wang, L. Wang, W. Jiang

*Department of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China***Objectives:**

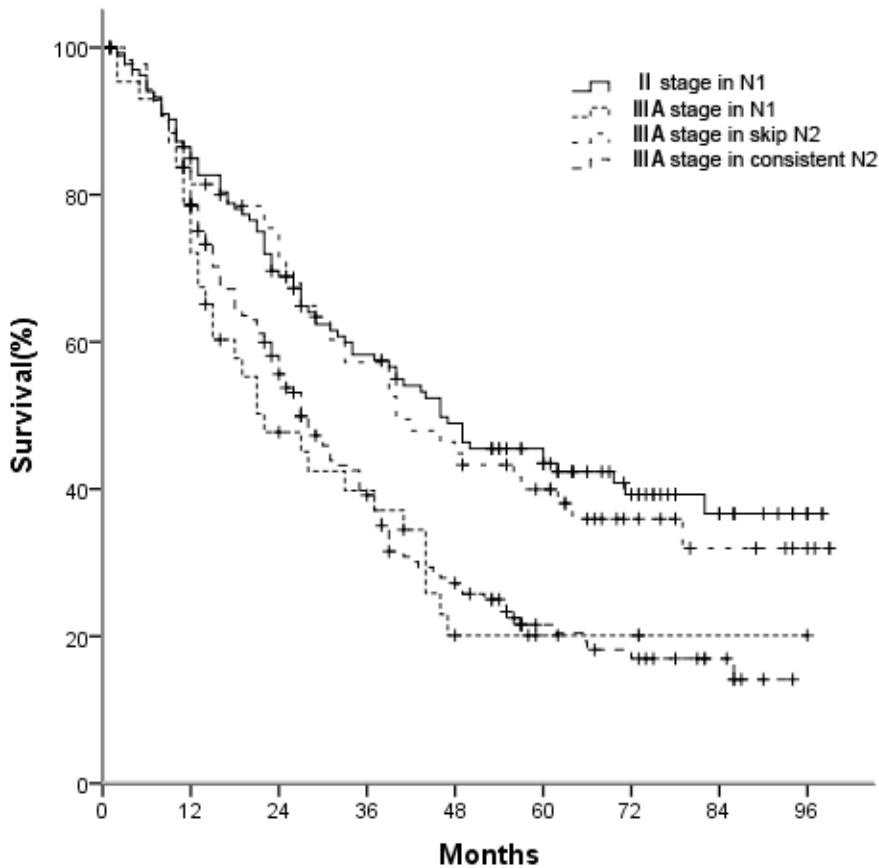
N2 disease may present with or without N1 involvement, constituting consistent and skip diseases in non-small cell lung cancer. Like hilar lymph nodes, the “skip” N2 lymph nodes are the first sites of lymphatic metastasis from primary tumors. We hypothesized that these N2 metastatic patients may be similar in prognosis to patients suffering from N1 metastasis.

**Methods:**

We performed a retrospective review of patients with histologically verified N1 or N2 NSCLC who underwent pulmonary surgical resection with systemic lymphadenectomy between January 2005 and July 2008. The clinical features and prognosis of skip N2 patients were first compared with those of consistent N2 patients. These factors were then compared between the skip N2 group and the N1 group.

**Results:**

A total of 447 patients, including 179 N1 patients, 75 skip N2 patients and 193 consistent N2 patients, were recruited. No statistical differences were observed in age, gender, smoking history, surgery, surgical approach, histology, tumor size, T stage or extent of resection between skip N2, consistent N2 and N1 groups. There was a significantly better 5-year survival rate in skip N2 than in consistent N2 group (37.8% versus 21.5%  $p=0.009$ ). The overall 5-year survival rate was not significantly different between skip N2 group and N1 group (37.8% versus 37.7%  $p=0.964$ ). The 5-year survival rate of the stage IIIA skip N2 patients was comparable to that of the stage II N1 patients (40.0% vs 43.5%,  $p=0.630$ ) but was significantly better than the survival rates of patients in both the stage IIIA N1 group (20.1%,  $p=0.020$ ) and the stage IIIA consistent N2 group (21.6%,  $p=0.004$ ).

**Conclusion:**

The 5-year survival rate of the skip N2 patients was better than consistent N2 patients, and was not worse than that of the N1 patients. Further studies of larger population are needed to confirm the findings.

**Disclosure:** No significant relationships.



F-160

## COMPETING RISK ANALYSIS OF CANCER-SPECIFIC MORTALITY IN OLDER PATIENTS WITH NON-SMALL CELL LUNG CANCER AFTER THORACOSCOPIC MAJOR LUNG RESECTION

Xizhao Sui, H. Zhao, F. Yang, F. Yang, Y. Wang, J. Wang

*Department of Thoracic Surgery, People's Hospital, Peking University, Beijing, China*

### Objectives:

Thoracoscopic major lung resection has been proven with improved short-term outcomes without compromise of cancer outcomes, and has been recommended for older patients. This study compared the long-term outcomes in patients older than 75 years to younger patients, and analyzed the cancer-specific mortality.

### Methods:

We retrospectively collected data from NSCLC patients who underwent VATS major lung resection. A propensity score matched study was conducted with variables of gender, pathology, stage, type of surgery and year of surgery. Perioperative data and long-term survival were compared between the two groups. The cumulative incidence function (CIF) of the cancer-specific death was computed, adjusting for non-cancer-specific death as a competing risk.

### Results:

91 patients aged >75 years were matched with 182 younger patients. The older group had more comorbidity, higher ASA scores, and worse forced expiratory volume in 1 second than the younger group. The tumor characteristics were similar. For short-term outcomes, the older group had significantly prolonged drainage duration and postoperative stay. The morbidity rate in older group was higher than the younger group (41.8% vs 26.4%;  $p=0.010$ ). No difference was seen in perioperative mortality rate. For long-term outcomes, no difference was seen in DFS. However, the older group had a worse OS, with 5-year OS of 58.8% for the older and 66.4% for the younger group ( $p=0.028$ ). The CIFs of cancer-specific death were not significantly different between the two groups with 5-year cancer-specific death rate of 22.4% for the older patients and 28.6% for the younger patients ( $p=0.42$ ). However, the older patients was significantly associated with the incidence of non-cancer-specific death than the younger patients (18.7% vs. 5.6%,  $p=0.043$ ).

### Conclusion:

For older NSCLC patients, thoracoscopic major lung resection were feasible with acceptable perioperative morbidity and mortality. Older patients had a similar cancer prognosis than the younger patients. However, non-cancer-specific death were more common in older patients.

**Disclosure:** No significant relationships.

**F-161****SEMIPRONE POSITION FOR UNIPORTAL VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY**

Zongwu Lin, J. Xi, S. Xu, W. Jiang, Q. Wang

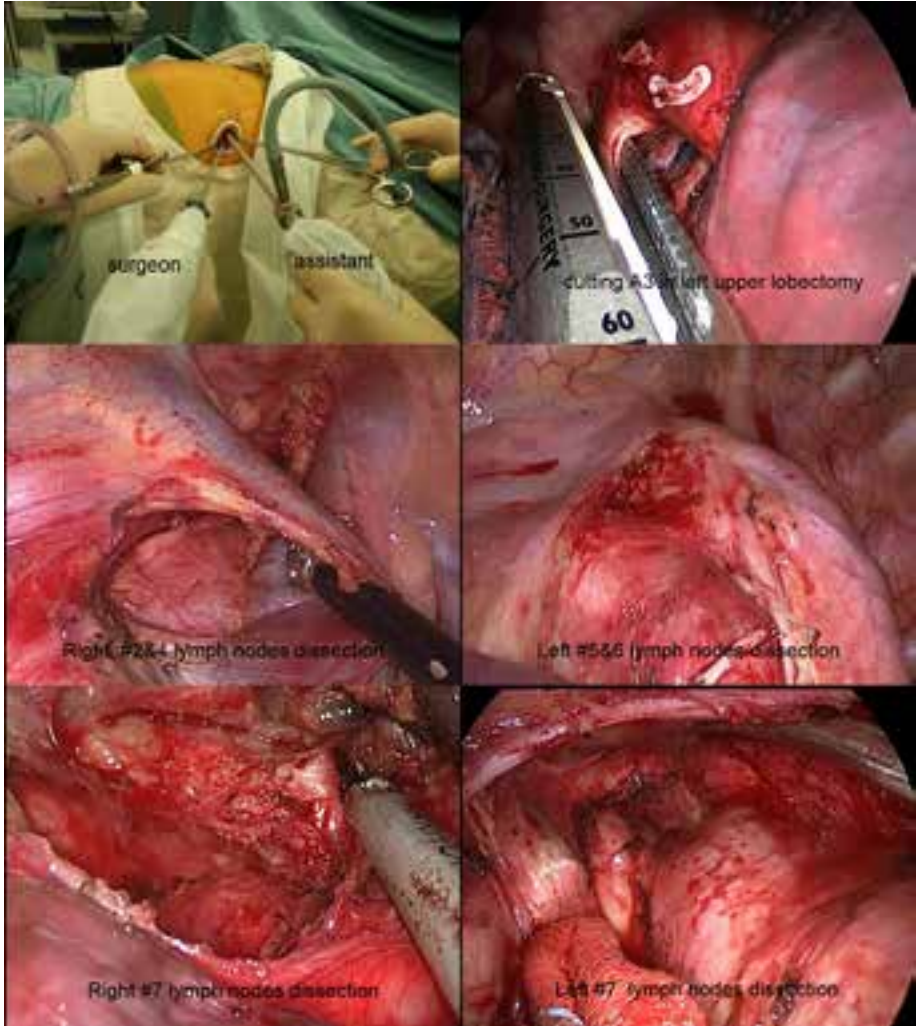
*Department of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China*

**Objectives:**

Most surgeons perform uniportal video-assisted thoracic surgery (VATS) lobectomy in lateral decubitus position. No surgeon has reported semiprone position for uniportal lobectomy while semiprone position has been widely utilized for minimally invasive esophagectomy over the last few years because it provides better ergonomics and better exposure for the posterior mediastinum. The feasibility and safety of semiprone position for uniportal VATS lobectomy was investigated.

**Methods:**

From May 2014 to December 2014, 36 patients received uniportal VATS lobectomy in semi-prone position. Mediastinal lymph node dissection with non-grasping en bloc technique was performed after lobectomy if malignant tumor was confirmed. The surgeon and the sole assistant both stood on the ventral side of the patient. The surgeon stood caudally, holding a curved suction with the left hand and a harmonic scalpel with the right hand. The assistant held a thoracoscope and an endoscopic grasper containing a small gauze for pushing lung.



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**Results:**

Of 36 attempted lobectomy, 32 were successfully completed with uniportal VATS in semiprone position. One operation converted to open surgery, 2 converted to three-port VATS and 1 converted to two-port VATS in the first 14 cases. Each converted operation was the first case of a certain lobectomy. Mean operation duration was  $156.0 \pm 54.8$  (85-340) minutes; mean blood loss was  $74.7 \pm 139.4$  (20-600)ml; mean thoracic drainage time was  $3.4 \pm 2.4$  (1-12) days and mean postoperative length of hospital stay was  $5.4 \pm 2.5$  (3-14) days. Mean number of dissected lymph node stations was  $7.0 \pm 0.9$  (5-9) and mean number of lymph nodes was  $19.8 \pm 5.4$  (7-35). Three patients developed minor complications, and there was no major complication or mortality.

**Conclusion:**

Semiprone position for uniportal VATS lobectomy was safe and feasible for experienced surgeons, which could provide better ergonomics, reduce damage to lung and facilitate mediastinal lymph node dissection. However, it is prone to convert to two-port VATS or three-port VATS or thoracotomy for inexperienced surgeons.

**Disclosure:** No significant relationships.

**Posters****MONDAY, 1 JUNE 2015****17:00 - 19:00****SESSION VII: MODERATED POSTERS****P-162****OVERALL SURVIVAL AND TUMOR RECURRENCE AFTER VATS LOBECTOMY OF N1 POSITIVE NON-SMALL CELL LUNG CANCER IS EQUAL TO OPEN RESECTION**Florian Augustin<sup>1</sup>, H. Maier<sup>1</sup>, P. Klammer<sup>1</sup>, P. Lucciarini<sup>1</sup>, M. Fiegl<sup>2</sup>, T. Schmid<sup>1</sup><sup>1</sup>University Hospital For Visceral, Transplant and Thoracic Surgery, Medical University of Innsbruck, Innsbruck, Austria<sup>2</sup>Oncology, Medical University of Innsbruck, Innsbruck, Austria**Objectives:**

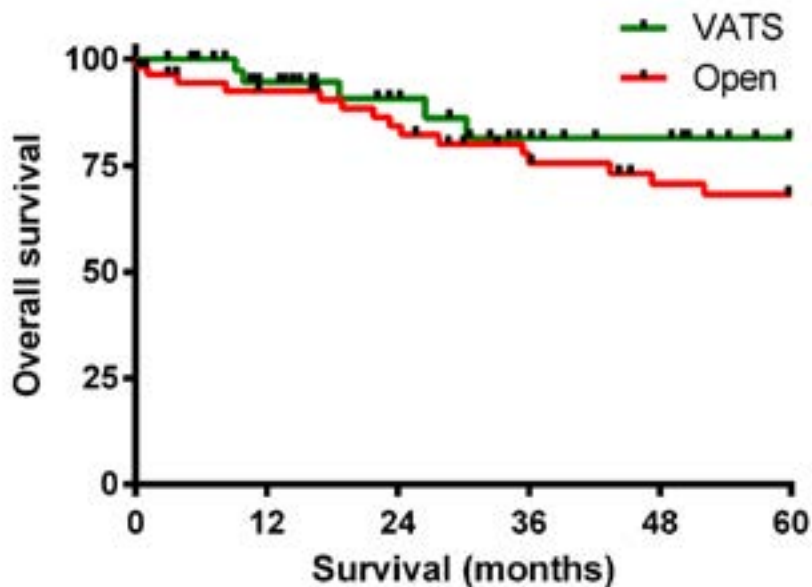
Video-assisted thoracoscopic surgery (VATS) is an accepted alternative to open resection for early stage non-small cell lung cancer. This study was performed to analyze survival after primary VATS anatomic resection for nodal positive NSCLC compared to an open approach.

**Methods:**

The prospective institutional VATS database was searched for pN1 patients after primary surgery for NSCLC (43/390 patients between February 2009 and December 2014). Exclusion criteria were neoadjuvant treatment and conversion to thoracotomy. Demographics and survival were compared to a historic group of N1 positive patients, who underwent primary open surgery via a standard posterolateral thoracotomy for lung cancer between 2002 and 2007 (57 patients).

**Results:**

Age (65 vs 61.5 years), gender and stage distribution (UICC IIA vs >IIA) did not differ between the VATS and open group. More than half of the patients in the VATS group had clinical stage N0 (22/43). More people received adjuvant therapy after VATS lobectomy (34/43 vs 31/57,  $p=0.0118$ ). Median follow up was 25 months in the VATS group and 45 months in the open group. Disease recurrence occurred in 14/43 and 22/57 patients after a median of 13 and 12 months, respectively, ( $p=0.6743$ ). Overall survival did not differ between the two groups (Figure 1, log-rank,  $p=0.3690$ ). No survival difference was found between unforeseen and clinically evident nodal positive patients in the VATS group (log-rank,  $p=0.9686$ ).

**Conclusion:**

VATS lobectomy in nodal positive lung cancer patients is oncologically equal to open resection with similar survival and recurrence rates. More than half of the lymph node metastases in the VATS group have been missed by clinical staging. Interestingly, the higher rate of patients receiving adjuvant chemotherapy after VATS lobectomy did not result in significant better survival.

**Disclosure:** No significant relationships.





P-163

**STAGING AND SURVIVAL OUTCOME AFTER ANATOMIC SEGMENTECTOMY VERSUS LOBECTOMY FOR CLINICAL STAGE I NON-SMALL-CELL LUNG CANCER**

Frank Beckers, I. Werner, E. Stoelben

*Department of Thoracic Surgery, University Medical Center Witten/Herdecke, Lung Clinic Merheim, Campus Cologne, Germany, Cologne, Germany***Objectives:**

Although anatomic segmentectomy has been considered a compromised procedure by many surgeons, there are some series that have demonstrated tumor recurrence and patient survival rates that are equal to those achieved by lobectomy. The primary object of this study was to analyse the survival rates of segmentectomy vs. lobectomy in clinical stage I lung cancer.

**Methods:**

A retrospective data set including 451 patients with clinical stage I lung cancer operated by anatomic segmentectomy or lobectomy between 2006 and 2011 in a single center.

**Results:**

Between 2006-2011 451 patients with clinical stage I lung cancer received an anatomic segmentectomy (n=173, group1) or a lobectomy (n=272, group2). Perioperative mortality was 0.5% in group 1 and 1.4% in group 2. There was no significant difference in 5 year survival between the groups (68% vs 62%, p=0.381). Segmentectomy was not found to be an independent predictor of recurrence or overall survival. In the patients with clinical stage cT1b with a tumor size between 2 and 3 cm, the percentage of unsuspected N2 nodal involvement was 9.2%, in the group of clinical stage 1a tumors (<2cm) the rate of unsuspected N2 was 5.2%.

**Conclusion:**

In this large and homogenous collective the 5 year survival rate showed no significant difference between anatomical segmentectomy or lobectomy in clinical stage I lung cancer. Anatomical segmentectomy is an oncological equal parenchymal saving resection type for early stage lung cancer. In contrast to the guidelines, our data suggested that patients with a tumor diameter between 2 and 3 cm (cT1b) should achieve an invasive staging of the mediastinum to reduce the rate of unsuspected lymph node involvement.

**Disclosure:** No significant relationships.

**P-164****PROGNOSTIC FACTORS FOR RESECTION OF ISOLATED PULMONARY METASTASES IN BREAST CANCER PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS**Jun Fan, D. Chen, H. Du, C. Shen, G. Che*Department of Thoracic Surgery, West China Hospital, Chengdu, China***Objectives:**

The aim of this study was to conduct a systematic review and meta-analysis of cohort studies to assess the 5-year overall survival rate and the prognostic factors for pulmonary metastasectomy in breast cancer patients.

**Methods:**

An electronic search in MEDLINE (via PubMed), EMBASE (via OVID), CENTRAL (via Cochrane Library), and Chinese BioMedical Literature Database (CBM) complemented by manual searches in article references were conducted to identify eligible studies. All cohort studies in which survival and/or prognostic factors for pulmonary metastasectomy from breast cancer were reported were included in the analysis. We calculated the pooled 5-year survival rates, identified the prognostic factors for overall survival (OS) and combined the hazard ratios (HRs) for the identified prognostic factors.

**Results:**

Sixteen studies with a total of 1937 patients were included in this meta-analysis. The pooled 5-year survival rates after pulmonary metastasectomy was 46% (95% confidence interval [95% CI] 43%-49%). The poor prognostic factors were disease-free interval (<3years) with HR=1.70(95%CI 1.37-2.10), resection of metastases (incomplete) with HR=2.06(95%CI 1.63-2.62), No. of pulmonary metastases (>1) with HR=1.31(95%CI 1.13-1.50) and the hormone receptor status of metastases (negative) with HR=2.30(95%CI 1.43-3.70).

**Conclusion:**

Surgery with a relatively high 5-year overall survival rate after pulmonary metastasectomy (46%), may be a promising treatment for pulmonary metastases in the breast cancer patients with a good performance status and limited disease. The poor prognostic factors were disease-free interval (<3years), resection of metastases (incomplete), No. of pulmonary metastasis (>1) and hormone receptor status of metastases (negative).

**Disclosure:** No significant relationships.

P-165

## THE USE OF TOMODENSITOMETRIC LUNG VOLUMETRY TO EVALUATE POSTOPERATIVE PREDICTED FEV1 IN NON-SMALL CELL LUNG CANCER SURGERY

Alex Fourdrain<sup>1</sup>, F. De Dominicis<sup>1</sup>, J. Iquille<sup>1</sup>, F. Prevot<sup>1</sup>, J. Monconduit<sup>1</sup>, E. Lorne<sup>2</sup>, A. Potier<sup>1</sup>, P. Bagan<sup>3</sup>, P. Berna<sup>1</sup>

<sup>1</sup>*Thoracic and Vascular Surgery, Amiens University Hospital, Amiens, France*

<sup>2</sup>*Departement D'anesthésie, Amiens University Hospital, Amiens, France*

<sup>3</sup>*Thoracic and Vascular Surgery, Victor Dupouy Hospital, Argenteuil, France*

### Objectives:

Postoperative predicted FEV1 (ppoFEV1) is an essential estimation in preoperative course for NSCLC surgery. Several methods of assessment exist. We evaluate a lung volumetry approach based on thoracic tomodensitometry with injection, performed during preoperative assessment.

### Methods:

Over one year, we performed a prospective study in NSCLC eligible patients to evaluate the difference between ppoFEV1 and 3 months postoperative FEV1 calculation (poFEV1). We excluded patients with a tomodensitometry performed in other hospital, and those who presented poFEV1 influencing factors like atelectasis, pleural effusion, pneumothorax, or pneumonia. Signed informed consent was collected on 120 patients and 23 were included: 5 pneumonectomies, 17 lobectomies and one inferior bilobectomy. ppoFEV1 was calculated with 4 usual methods : Nakahara formula, Juhl and Frost formula, ventilation and perfusion scintigraphy, and with a fifth method using a tomodensitometric lung volumetry approach. Lung parenchyma volume was calculated twice, and separately by 2 radiologists. Tumoral volume, and emphysema defined by a 950 HU limit were subtracted from the total lung volume in order to estimate the ppoFEV1.

### Results:

We compared 5 methods of ppoFEV1 estimation and calculated the mean difference of volume between ppoFEV1 and poFEV1. Statistical analysis with Pearson correlation coefficient showed a better correlation of lung tomodensitometric volumetry than Nakahara formula, Juhl and Frost formula, perfusion and ventilation scintigraphy with respectively :  $R^2=0.79$  vs  $0.75$ ,  $0.75$ ,  $0.67$ ,  $0.64$  with a mean difference of volume of  $266\pm 229\text{ml}$  vs  $320\pm 262\text{ml}$ ,  $332\pm 251\text{ml}$ ,  $304\pm 295\text{ml}$  and  $312\pm 303\text{ml}$ .

### Conclusion:

Tomodensitometric lung volumetry calculation appears to be a satisfying ppoFEV1 evaluation method, and seems more reliable than other approaches. Part of the preoperative assessment, this estimation does not involve further morphologic examinations and particularly scintigraphy which is radioactive. This method may become the ppoFEV1 evaluation reference if shown by a more powerful study.

**Disclosure:** No significant relationships.

**P-166****RISK OF THE PREOPERATIVE UNDERESTIMATION OF TUMOR SIZE OF LUNG CANCER IN PATIENTS WITH PULMONARY FIBROSIS**Mariko Fukui, T. Matsunaga, K. Takamochi, S. Oh, K. Suzuki*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

Sublobar resection of lung cancer (LC) in patients (pts) with idiopathic pulmonary fibrosis (IPF) reduces the risk of acute exacerbation of IPF after surgery, though it would increase the risk of local recurrence. To complete sublobar resection, enough surgical margin is inevitable. However it is often difficult to know precise maximum tumor dimension of lung cancer in pts with IPF. This study assessed the accuracy of tumor size estimated based on preoperative computed axial tomography (CAT) scan in LC pts with IPF.

**Methods:**

Retrospective study was performed on 1253 pts who underwent surgical resection of primary LCs at our institute between 2009 and 2013. All thin-section CAT findings were reviewed, and finally 94 (7.5%) patients were complicated with IPF preoperatively. Discrepancy between radiological and pathological tumor dimensions was measured and underestimation was defined as 10 mm or more in pathological tumor dimension compared with radiological one. The rate and cause of preoperative underestimation were compared between pts with and without IPF.

**Results:**

The maximum tumor dimension was underestimated in 12 (12.7%) out of 94 pts with IPF and 37 (3.2%) out of 1159 pts without IPF (HR 4.128,  $p < 0.001$  in logit regression). While underestimation in pts with IPF was due to unexpected tumor extension in honeycomb lung, invasion to lymphatic duct, or lepidic growth, in pts without IPF due to lepidic growth, intrabullous extension, or mucinous histology.

**Conclusion:**

Pulmonary fibrosis is the risk of underestimation in preoperative measurement of the size of lung cancer. Thus tumor extension should be assessed carefully to maintain enough surgical margin for resection. Careless sublobar resection should be avoided for lung cancer especially in pts with IPF.

**Disclosure:** No significant relationships.

P-167

## ELEVATED INFLAMMATORY PARAMETERS AND INFLAMMATION SCORES ARE ASSOCIATED WITH POOR PROGNOSIS IN PATIENTS UNDERGOING CURATIVE PULMONARY METASTASECTOMY FOR COLORECTAL CANCER

Bahil Ghanim, T. Schweiger, G. Lang, W. Klepetko, K. Hoetzenecker

*Division of Thoracic Surgery, Medical University of Vienna, Vienna, Austria*

### Objectives:

Pulmonary metastasectomy (PM) has evolved to become a standard treatment for colorectal cancer metastases of the lung. However, biomarkers to estimate prognosis after PM are widely missing. We therefore investigated the prognostic impact of inflammatory related biomarkers and scores in patients undergoing curative PM for colorectal cancer.

### Methods:

We analyzed a prospectively collected data sets of 52 patients treated in our institution between April 2009 and June 2014. Fibrinogen, C-reactive protein (CRP), the modified Glasgow prognostic score (mGPS) and the neutrophil to lymphocyte ratio (NLR) at the time of PM were tested for their prognostic power and correlated to time to recurrence (TTR), time to lung specific recurrence (TTLR) and overall survival (OS).

### Results:

Median OS after PM of all included patients (n=52, 21 female, 31 male, mean age  $\pm$  standard deviation:  $62.65 \pm 11.41$  years) was 36 months (95 confidence interval (CI) 24.73-47.27 months). In univariate survival analyses, high fibrinogen (hazard ratio (HR) 5.51 CI 1.21-25.17), elevated CRP (HR 2.81 CI 1.08-7.28), mGPS above 0 (HR 2.81 CI 1.08-7.28) and a NLR of 4 or higher (HR 3.05 CI 1.02-9.13) were associated with poor OS. Median TTR was 15 months for all patients. Fibrinogen (HR 3.79 CI 1.32-10.94) and the NLR (HR 2.99 CI 1.20-7.46) but not CRP ( $p=0.102$ ) and mGPS ( $p=0.102$ ) were found to indicate TTR. With regard to TTLR, only the NLR was found to predict early lung recurrence (HR 3.02 CI 1.06-8.564). After multivariate analyses, fibrinogen was the only significant OS predictor. However, all investigated inflammatory biomarkers and scores were found to be prognostic for TTR in multivariate analyses.

### Conclusion:

Inflammatory markers provided promising prognostic information in this prospective cohort of curative pulmonary metastasectomy patients after colorectal carcinoma. Thus, further validation is justified to verify the prognostic role of these markers in order to establish them in clinical routine.

**Disclosure:** No significant relationships.

P-168

**POSTPNEUMONECTOMY EMPYEMA IMPACT ON SURVIVAL OF PATIENTS WITH LUNG CANCER**

N. Wójcik<sup>1</sup>, J. Wojcik<sup>1</sup>, K. Safranow<sup>2</sup>, B. Kubisa<sup>1</sup>, J. Pieróg<sup>1</sup>, L. Kochanowski<sup>1</sup>, J. Alchimowicz<sup>1</sup>, A. Kozak<sup>1</sup>, M. Bielewicz<sup>1</sup>, M. Wojtys<sup>1</sup>, M. Piotrowska<sup>1</sup>, D. Ciekanska<sup>1</sup>, Tomasz Grodzki<sup>1</sup>, B. Maciag<sup>1</sup>

<sup>1</sup>*Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland*

<sup>2</sup>*Biochemistry, Pomeranian Medical University, Szczecin, Poland*

**Objectives:**

Postpneumonectomy empyema is still a challenge for surgeons, however with potential benefits after completion of treatment. Previous data from our center suggested an improvement of survival in the group of lung cancer-patients with postpneumonectomy empyema as a kind of a side effect of immunomodulation caused by empyema.

**Methods:**

The study involved the group of 32 patients who underwent pneumonectomy followed by post-pneumonectomy empyema in 1996-2007 with full recovery. The entire group was treated by accelerated treatment rule. The study group was matched with the group of 96 patients who underwent uncomplicated pneumonectomy in our center, in 1996-2009. The study and control group had similar proportion of female-sex 18,75% vs 15,63%, squamous cell carcinoma/adenocarcinoma ratio (68,75%/28,23%) vs (75%/23,96%), N0/N+ ratio (62,50%/37,50%) vs (60,42%/39,58%) and age (mean age 60,4 vs 58,65).

**Results:**

Overall 5-year survival in the study group was 62,5% (20/32) in comparison to 32,29% in the control group (31/96). Overall 7-year survival in the study group was 59,38% (19/32) in comparison to 22,92% in control group (22/96). The same type comparison of the overall 10-years survival ratio was 37,5% (12/32) vs 10,42% (10/96). All-cause mortality ratio was lower in the study group vs control group: 53,1% (17/32) vs 79,17% (76/96). Cancer-related mortality ratio was similarly lower in the study group vs control group: 15,62% (5/32) vs 31,25% (30/96). Non cancer-related mortality in the study group and control group was 37,5% (12/32) vs 47,92% (46/96), however 23 deaths-23,96% (23/96) in the control group were undefined. Median/mean follow-up time (months) in the study group was 110,5/89,18 in comparison to the control group 33,8/49,32.

**Conclusion:**

Follow-up results of lung cancer-patients with postpneumonectomy empyema demonstrate longer survival in comparison to the results of patients treated by uncomplicated pneumonectomy.

**Disclosure:** No significant relationships.



P-169

**OUTCOMES OF COMPROMISED SUBLOBAR RESECTION FOR CLINICAL-STAGE IA HIGH RISK LUNG CANCER PATIENTS WITH A RADIOLOGICALLY SOLID APPEARANCE ON COMPUTED TOMOGRAPHY**

Aritoshi Hattori, K. Takamochi, T. Matsunaga, S. Oh, K. Suzuki  
*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

The purpose of the present study was to identify favorable clinical factors of survival after sublobar resection in clinical-stage IA high risk lung cancer patients with radiological solid appearance on thin-section CT.

**Methods:**

Among 1109 resected clinical-stage IA lung cancer from 2008 to 2013, 115 (10%) patients who presented radiological solid appearances on thin-section CT and were poor candidates for lobectomy underwent compromised sublobar resection. Radiological solid lung cancer was defined as  $0.5 \leq \text{consolidation/tumor ratio}$ . Medically “high risk” patients were considered as patients on whom it is impossible to perform lobectomy. The definition of high risk patients was based on the criteria of RTOG, ACOSOG, and JCOG.

**Results:**

The high risk cohorts consisted of 65 men and 50 women, with an average age of 71.2 years. Among them, poor pulmonary function was found in 57%, cardiac related diseases in 43%, and cerebral relate diseases in 10%. Furthermore, 56% of the patients were with one complication, and 44% with two or more complications. Three-year overall survival (OS) was 74.2%. Multivariate analysis identified male gender, large tumor size, high CEA as significant negative predictors of survival ( $p=0.0049, 0.0086, 0.0221$ ). When the high risk patients were divided based on the number of negative clinical predictors, 3-year OS of the patients who met neither or one of these negative predictors ( $n=66$ ) was 91.1%, while that of the patients with 2 negative predictors was 67.6% ( $n=35$ ), the patients who met all of the poor conditions ( $n=14$ ) was 17.5% even in clinical-stage IA disease ( $p<0.0001$ ).

**Conclusion:**

Even in clinical-stage IA radiologically solid lung cancer patients who are not lobectomy candidates due to the anticipated risk, sublobar resection should be the first choice and could contribute to feasible survival outcomes, if patients show favorable clinical factors. Thus, the selection criteria of medically inoperable patients should be reevaluated in our daily practice.

**Disclosure:** No significant relationships.

## P-170

**ATRIAL FIBRILLATION AFTER PULMONARY LOBECTOMY—HOW LONG DOES IT CONTINUE, TEMPORARY OR PERSISTENT?**

Hironori Ishibashi, K. Seto, C. Takasaki, M. Kobayashi, K. Okubo  
*Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan*

**Objectives:**

Atrial fibrillation (Af) after pulmonary lobectomy continues to be a cause of morbidity and mortality. Few studies have been reported on how long Af continues after pulmonary lobectomy and on the type of Af (temporary or persistent). This study was aimed at investigating how long postoperative Af continues and comparing the different perioperative factors between the temporary and persistent types.

**Methods:**

A retrospective study of 500 patients who underwent lobectomy at our institute between April 2010 and December 2014 was performed. Patients with postoperative Af were identified and classified into two groups: temporary type—does not require long-term (>30 days) medication or needs no medication after discharge—and persistent type—requires long-term medication. The variables analysed were age, sex, body mass index, smoking status, FEV<sub>1.0</sub>%, %VC, respiratory complication, cardiovascular complication, type of lobectomy, surgical procedure, operating time, blood loss, date of Af occurrence, and other postoperative complications.

**Results:**

Postoperative Af occurred at  $3.01 \pm 0.37$  postoperative days (POD), continued for  $10.2 \pm 9.1$  h (range, 1–72 h), and was observed in 32 (6.4 %) patients (27 men, 5 women). Severe complications associated with postoperative Af included one case of brain infarction (0.3%) in the persistent group. Among the 32 patients, 14 were included in temporary type group and 18 in the persistent type group. Af occurred earlier in the temporary type ( $1.5 \pm 0.2$  POD vs.  $3.7 \pm 0.3$  POD,  $p < 0.001$ ). Intraoperative blood loss was higher in the temporary type ( $745 \pm 80$  mL vs.  $250 \pm 79$  mL,  $p = 0.020$ ). There were no significant differences in the other factors between the two groups.

**Conclusion:**

Postoperative Af may be classified into two types: temporary or persistent. The persistent type occurs later, needs long-term medication, and requires attention because of severe complications.

**Disclosure:** No significant relationships.





P-171

**PREDICTED POST OPERATIVE FORCED EXPIRATORY VOLUME IN ONE SECOND FOR ELECTIVE LUNG SURGERY – SHOULD IT BE > 40%?**

George Karimundackal, V.D. Pai, S. Jiwnani, C.S. Pramesh

*Thoracic Surgery, Surgical Oncology, Tata Memorial Centre, Mumbai, India*

**Objectives:**

Surgery remains the only curative treatment of early lung cancer. Conventionally, it is believed that predicted post operative forced expiratory volume in one second [ppo-FEV1] is the best predictor of post operative complications. There are studies reporting perioperative mortality in the range of 16-50% when ppo-FEV1 is <40%. However, with advances in the perioperative management, there has been growing interest to offer surgical treatment to those patients with lower ppo-FEV1. With this background we aimed to compare perioperative complications in those with ppo-FEV1 between 30 to 40% with those having ppo-FEV1 > 40%.

**Methods:**

This is a retrospective review of a prospectively maintained database. Patients who underwent lobectomy or pneumonectomy at our institute between January 2004 to December 2014 were included. Post operative pulmonary complications as well as 30 day morbidity and mortality of all the included patients was noted. Patients were divided into two groups – those with ppo-FEV1/DLCO > 40% and those with ppo-FEV1/DLCO 30-40% and perioperative outcomes were compared between them. Chi square test was used to determine the statistical significance

**Results:**

Five hundred seventy nine patients were included in the study. There were 81 patients with ppo-FEV1/DLCO in the range of 30-40% and 498 patients with ppo-FEV1/DLCO of > 40%. Overall 81 patients developed pulmonary complications of which 10 patients had life threatening complications. Eleven patients (13%) in the former group and 70 patients (14%) in the latter group had pulmonary complications (p value -0.497). Perioperative mortality occurred in 4 patients in the former group and 11 patients in the latter group (p value- 0.145).

**Conclusion:**

In the modern day practice, patients with ppo-FEV1 of 30-40% tolerate surgery well with acceptable perioperative morbidity mortality. Hence the cutoff of ppo-FEV1 to offer surgery should be reduced to 30%.

**Disclosure:** No significant relationships.

P-172

**POLO-LIKE KINASE 1 AND 3 MRNA EXPRESSION IN EARLY-STAGE NON-SMALL CELL LUNG CANCER**

W. Laudański<sup>1</sup>, O. Kowalczyk<sup>2</sup>, J. Kisluk<sup>2</sup>, P. Dziegielewski<sup>1</sup>, J. Niklinski<sup>2</sup>,  
Mirosław Kozłowski<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, Medical University of Białystok, Białystok, Poland*

<sup>2</sup>*Department of Clinical Molecular Biology, Medical University of Białystok, Białystok, Poland*

**Objectives:**

High mortality of NSCLC patients after a curative surgery suggests that additional factors are needed for patient's post-operative prognosis and therapeutic decisions. Based on high proliferation rate of tumor cells, mitosis-specific molecules, such as Polo-like kinases, are under consideration as possible prognostic factors and targets for anticancer therapy. However, their expression and prognostic impact in lung cancer remain poorly investigated. Thus, the aim of the present study was to investigate the mRNA expression of two Polo-like kinases, PLK1 and PLK3, in early-stage NSCLCs.

**Methods:**

Specimens of tumors and corresponding normal lung tissues were collected intraoperatively from 148 NSCLC patients and used to extract RNA. mRNA of the PLK1 and PLK3 was quantified by real-time PCR method and expressed as a fold-change between tumor and normal tissues.

**Results:**

The mRNA level of *PLK1* was 21.72-fold higher in tumor compared to normal lung ( $P < 0.001$ ). Gene up-regulation was more significant in non-squamous versus squamous histology tumors (median fold-changes 22.36 and 12.35, respectively;  $P = 0.022$ ), and in high-grade compared to low-grade tumors (fold-changes 54.59 versus 10.69 for G3+G4 versus G1+G2 tumors, respectively;  $P < 0.001$ ). In contrast, *PLK3* was down-regulated in NSCLCs (median fold-change -2.25;  $P < 0.001$ ), more significantly in squamous compared to nonsquamous tumors (fold-changes -3.09 versus -1.59, respectively;  $P < 0.001$ ) and in stage II compared to stage I disease (fold-changes -6.63 versus -1.51, respectively;  $P = 0.048$ ). No associations between *PLK1* mRNA level and patients' survival was found, while a trend towards poorer outcome of the patients with lower *PLK3* expression was observed (log-rank test  $P = 0.161$ ), especially in the patients with low-grade tumors ( $P = 0.075$ ).

**Conclusion:**

*PLK1* is significantly up-regulated in early-stage NSCLC and may be considered as a possible antitumor target. In contrast, *PLK3* transcription is repressed and is associated with more aggressive disease.

**Disclosure:** No significant relationships.



P-173

**INTERSTITIAL FLUID PRESSURE MAY BE USED AS A PROGNOSTIC FACTOR FOR LUNG CANCER**

*Takeshi Mori, T. Koga, K. Fujino, Y. Motooka, H. Shibata, K. Ikeda, K. Shiraishi, M. Suzuki  
Thoracic Surgery, Kumamoto University Hospital, Kumamoto, Japan*

**Objectives:**

Solid tumors show increased interstitial fluid pressure (IFP), which correlates to a number of pathophysiological features of tumors. Moreover, IFP was a prognostic factor for cervical cancer, and it indicated the effect of bevacizumab for rectal cancer. However, there have been no reports on the usefulness of measuring IFP in lung cancer. Therefore, the aim of this study was to examine the relationship between IFP and the clinicopathological characteristics of lung cancer.

**Methods:**

IFP was measured prospectively in 215 patients with 219 lesions showing solid or part-solid appearance. Four patients with double lung cancer were excluded from the analysis, resulting in 211 patients with lung cancer being analyzed for the correlation between IFP and computed tomography (CT) appearance, size, TNM factors, maximal standardized uptake value (SUVmax), histological type, tumor grade, pleural and vessel invasion, Ki-67 index, microvessel density, and recurrence-free survival (RFS).

**Results:**

Lesions with part-solid appearance on CT scans were observed in 63 patients. The mean tumor size on CT scans was 2.8 cm. The mean IFP was 8.5 mm Hg; IFP was significantly correlated with the tumor size, SUVmax, TNM factors, vessel and pleural invasion, and Ki-67 index. Squamous cell carcinomas showed higher IFP than other histological types. Low IFP ( $\leq 7.4$  mm Hg) was associated with a better RFS compared to high IFP ( $> 7.4$  mm Hg).

**Conclusion:**

On the basis of these results, IFP could be used as a novel prognostic factor for lung cancer with solid components, as well as for other solid tumors.

**Disclosure:** No significant relationships.

P-174

**LONG-TERM QUALITY OF LIFE AMONG PATIENTS OPERATED ON FOR STAGE I NON-SMALL CELL LUNG CANCER: COMPARISON OF VIDEO-ASSISTED THORACOSCOPIC SURGERY AND THORACOTOMY**Ville Rauma<sup>1</sup>, H. Sintonen<sup>2</sup>, J. Rasanen<sup>1</sup>, J. Salo<sup>1</sup>, I. Ilonen<sup>1</sup><sup>1</sup>*General Thoracic and Esophageal Surgery Clinic, Heart and Lung Centre, Helsinki University Central Hospital, Helsinki, Finland*<sup>2</sup>*Department of Public Health, University of Helsinki, Helsinki, Finland***Objectives:**

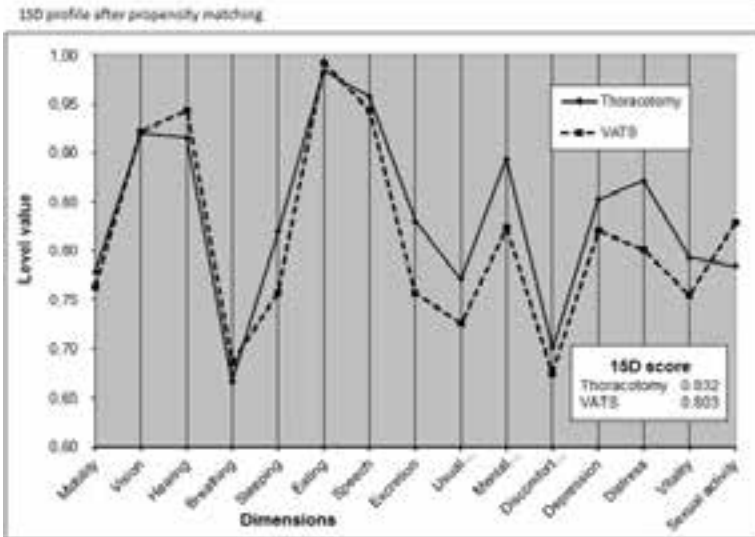
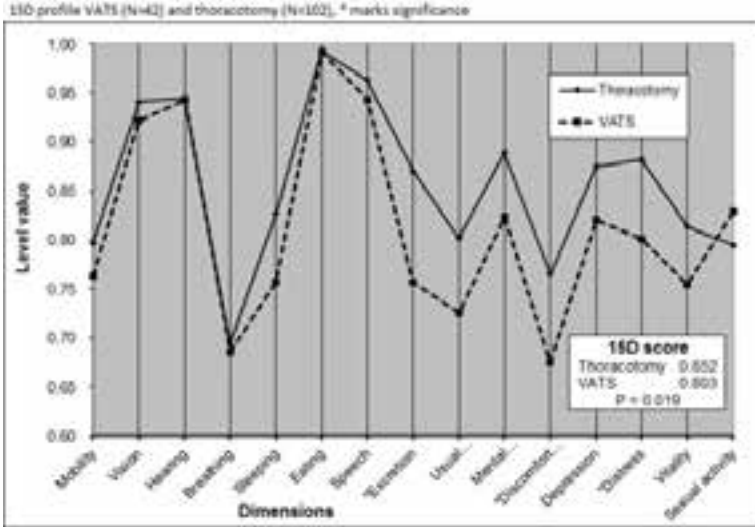
To determine if video-assisted thoracoscopic surgery (VATS) has better long-term health-related quality of life (HRQoL) than open thoracotomy patients operated on for stage I non-small cell lung cancer (NSCLC).

**Methods:**

430 NSCLC patients underwent lobectomy or segmentectomy between January 2000 and June 2009. In June 2011 196 alive Stage I patients were included in the study. Patients answered validated HRQoL questionnaire 15D. We compared VATS and thoracotomy those of patients operated through thoracotomy with and without propensity matching. Age, gender, smoking status, preoperative FEV1% and comorbidities were used to estimate the propensity score.

**Results:**

148 (77.5%) patients answered the questionnaire and 42 (28.4%) of the respondents were operated with VATS. Median follow-up time for the VATS group was 3.08 years and thoracotomy group 5.25 years. Prior to matching, the VATS group had significantly higher mean age (66.9 years vs 62.3 years,  $p = 0.005$ ) and more comorbidities with near to statistical significance ( $p = 0.055$ ). Before the matching the VATS group had statistically ( $p < 0.05$ ) and clinically significantly lower scores on the dimensions Excretion (0.757 vs 0.870), Discomfort (0.676 vs 0.765), Distress (0.801 vs 0.882) and on the 15D score representing the total HRQoL (Figure 1). After the matching none of the differences were statistically significant, even though the trend to the advantage of the thoracotomy group was still clear (Figure 2). The difference in the statistical significance of the results before and after the matching may be partly caused by the smaller number of observations as a result of the matching.



**Conclusion:**

Patients operated through VATS were on average in poorer condition and older than patients operated through thoracotomy. They also suffered from poorer long-term HRQoL but the difference was not statistically significant after propensity matching, which leveled the differences in preoperative features among the two groups.

**Disclosure:** No significant relationships.

P-175

**PREDICTIVE VALUE OF 18F-FDG PET/CT SUVMAX IN PULMONARY METASTASIS FROM COLORECTAL CANCER SUBMITTED TO SURGICAL RESECTION**

Ottavio Rena<sup>1</sup>, F. Guerrero<sup>2</sup>, L. Errico<sup>3</sup>, E. Ruffini<sup>2</sup>, P.L. Filosso<sup>2</sup>, C. Mossetti<sup>2</sup>, E. Papalia<sup>1</sup>, E. Lisi<sup>3</sup>, F. Ardissonne<sup>3</sup>, A. Oliaro<sup>2</sup>, C. Casadio<sup>1</sup>

<sup>1</sup>*Thoracic Surgery Unit, University of Eastern Piedmont, Novara, Italy*

<sup>2</sup>*Thoracic Surgery, University of Turin, Turin, Italy,*

<sup>3</sup>*Thoracic Surgery, University of Turin, Orbassano, Italy*

**Objectives:**

To investigate the predictive value in terms of long-term outcome of preoperative 18F-FDG PET/CT SUVmax and other clinicopathologic factors in patients submitted to pulmonary metastasectomy for colorectal cancer.

**Methods:**

During the period January 2000 – December 2010, 432 patients (264 males), mean age 62.5 years, underwent resection of pulmonary metastases from colorectal cancer with curative intent; mean disease-free interval (DFI) was 36.5 months. Preoperative CEA level was abnormal in 117 patients (27%). Mean preoperative PET/CT SUVmax was 6.4. Single metastasis was described in 266 patients (62%), 2 metastases in 87, 3 or more in 79 (total resected metastases = 659). Mean metastasis diameter was 22.5 mm. Lymph nodal (LN) status was assessed in 313 patients (72%). Three-hundred and five patients received a wedge-resection (71%), 38 had segmentectomy, 88 had lobectomy, 1 had pneumonectomy. An R0 resection was achieved in 409 cases (94%). Pre- or postoperative chemotherapy was administered to 207 patients (48%).

**Results:**

Mean follow-up was 62 months (range 1-167), with a 5-year recurrence-free survival and overall-survival of 50% and 54%. In univariate and multivariate analysis not complete resection (HR 3.2, 95% CI 2 – 4.9), PET/CT SUVmax > 6.4 (HR 2.8, 95% CI 1.7 – 4.2), preoperative CEA level > 5 (HR 2.2, 95% CI 1.4 – 3.2), LN metastasis (HR 2.1, 95% CI 1.3 – 3.8), DFI < 36 months (HR 1.8, 95% CI 0.9 - 3.1), number of metastasis > 1 (HR 1.5, 95% CI 1.1 – 2.3), were significantly associated with poor outcome (p<0.05).

**Conclusion:**

Not complete resection, elevated preoperative CEA levels, multiple metastasis, short DFI, and LN metastasis are confirmed factors affecting prognosis in patients submitted to pulmonary metastasectomy for colorectal cancer. Preoperative PET/CT SUVmax is demonstrated a strong predictor of long-term outcome too. A low PET/CT SUVmax probably identifies a disease with less aggressive biological behaviour.

**Disclosure:** No significant relationships.

P-176

## CLINICOPATHOLOGIC RISK FACTORS PREDICTING THE OCCULT NODAL METASTASIS IN T1-2N0M0 NON-SMALL CELL LUNG CANCER PATIENTS STAGED BY PET/CT

Ottavio Rena<sup>1</sup>, R. Boldorini<sup>2</sup>, E. Papalia<sup>1</sup>, G.M. Sacchetti<sup>3</sup>, F. Davoli<sup>1</sup>, A. Roncon<sup>1</sup>, D. Turello<sup>1</sup>, F. Massera<sup>1</sup>, C. Casadio<sup>1</sup>

<sup>1</sup>Thoracic Surgery Unit, University of Eastern Piedmont, Novara, Italy

<sup>2</sup>Pathology Department, University of Eastern Piedmont, Novara, Italy

<sup>3</sup>Nuclear Medicine Unit, "Maggiore della Carità" University Hospital, Novara, Italy

### Objectives:

To evaluate the incidence of occult lymph node metastasis in clinical N0 non-small cell lung cancer (NSCLC) patients by PET/CT and further to investigate the potential risk factors for lymph nodes involvement to predict which patients could be selected appropriately for limited surgery or other loco-regional therapies.

### Methods:

We retrospectively collected the clinical records of 431 patients diagnosed as N0 NSCLC by fusion of CT and 18FDG PET from January 2005 to December 2011. All patients received anatomical resection and lymph nodes dissection after a median of 11 days (range 5-18) after PET/CT scanning. Clinicopathologic factors such as tumour size, tumour location, tumour histology, grade of differentiation and primary tumour PET/CT SUVmax were analysed in order to identify risk factors for occult nodal metastasis in uni- and multivariate analysis.

### Results:

The median number of lymph nodal stations dissected was 5 (range 4 to 6) and the median number of LNs was 16 (range 9 to 35). Occult nodal metastasis was detected in 82/431 (19%) of the patients. Tumour size > 3 cm, tumour location at the upper left or inferior lobes and PET/CT SUVmax > 4.9 were identified independent predictors of occult nodal metastasis in N0 NSCLC patients at PET/CT by multivariate analysis. We divided our patients into three groups according to the absence (group 1) or the presence of 2 (group 2) or 3 (group 3) risk factors. The occult lymph node metastasis rate in groups 1, 2 and 3 was 2/186 (1.2%), 48/170 (28%) and 36/73 (49%), respectively.

### Conclusion:

T1-2N0M0 NSCLC patients by PET/CT with large tumour size, high SUVmax and located at the upper left or inferior lobes are a high-risk group for occult nodal metastasis. These tumours are not appropriate candidate for limited surgery or other loco-regional therapies.

**Disclosure:** No significant relationships.

P-177

**CAN THE VERTEBRAL ARTERY BE SACRIFICED? TECHNICAL ASPECTS OF SUBCLAVIAN ARTERY RECONSTRUCTION FOR T4 LUNG CANCER**Yasuo Sekine<sup>1</sup>, Y. Saitoh<sup>2</sup>, E. Koh<sup>1</sup>, A. Hata<sup>1</sup>, H. Suzuki<sup>3</sup>, I. Yoshino<sup>3</sup><sup>1</sup>*Department of Thoracic Surgery, Tokyo Women's Medical University Yachiyo Medical Center, Yachiyo, Japan*<sup>2</sup>*Department of Thoracic Surgery, National Hospital Organization Chiba Medical Center, Chiba, Japan*<sup>3</sup>*Department of Thoracic Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan***Objectives:**

To evaluate the necessity of vertebral artery reconstruction in T4 lung cancer patients with tumor invasion to the subclavian artery.

**Methods:**

From 1999 to 2013, we experienced 10 cases of subclavian artery reconstruction for T4 non-small cell lung cancer. Subclavian and vertebral artery angiography was performed preoperatively in all cases. We evaluated the relationship between operative management of the vertebral artery based on the preoperative radiological findings and postoperative brain complications.

**Results:**

Seven cases had superior sulcus tumors, and the other three cases had direct mediastinal invasion. In five cases each, the transmanubrial approach and the posterolateral hook incision were indicated according to the tumor location. Preoperative angiography of the vertebral artery revealed normal development with almost the same diameter on both sides in eight cases and poor development of the contralateral side compared to the operative side in two cases (cases #9, 10). The subclavian artery was reconstructed by a single artificial woven graft in seven cases, a Y-graft from the distal portion of the aortic arch to the subclavian and carotid arteries in two cases, and a four-branch graft for total arch reconstruction in one case (case #8). The vertebral artery was transected in seven cases, preserved in two cases, and reconstructed in one case (case #10). One patient, who had a normal angiogram and a transected vertebral artery, had an episode of temporary cerebellar symptoms that improved after one month. Case #9 had a transection of the vertebral artery in spite of poor development, suffered a severe brainstem infarction. Case #10 had reconstruction by a side-to-end anastomosis with the left subclavian artery graft without any postoperative brain complications.

**Conclusion:**

Preoperative subclavian and vertebral artery angiography is mandatory for lung cancer patients with major arterial invasion. Vertebral artery reconstruction is recommended for patients with poor development of the contralateral vertebral artery.

**Disclosure:** No significant relationships.





P-178

**POSTOPERATIVE ATRIAL FIBRILLATION IS LESS FREQUENT IN SEGMENTECTOMY COMPARED WITH PULMONARY LOBECTOMY**

Takuya Ueda, T. Matsunaga, S. Oh, K. Takamochi, K. Suzuki  
*General Thoracic Surgery, Juntendo University, Tokyo, Japan*

**Objectives:**

Randomized controlled trials comparing pulmonary lobectomy and sublobar resection for lung cancer has been completed as JCOG0802 / WJOG4507L in Japan. While we must wait for the final results, sublobar resection has already been indicated for various clinical situation in clinical practice. Thus advantage and disadvantage should be elucidated.

**Methods:**

Between February 2008 and March 2013, 1004 patients who underwent lobectomy or segmentectomy for lung cancer at our institute were enrolled in the study. Patients with a history of atrial fibrillation preoperatively were excluded. We have investigated the following factors for the predictor of the development of postoperative atrial fibrillation: gender, age, body mass index, pack-year smoking, preoperative CEA, preoperative respiratory function, history of ischemic heart disease, history of lung cancer surgery, clinical stage, surgical mode, operative time, amount of bleeding, mediastinal lymph node dissection. This study used univariate or multivariate analysis. Univariate analyses were performed by chi-square test, multivariate analysis by a logistic regression analysis.

**Results:**

Of the 1004 patients, 820 patients (81.7%) underwent lobectomy, 184 patients (18.3%) underwent segmentectomy. Postoperative atrial fibrillation occurred in total of 81 patients (8.1%). Among them, 77 patients was in the lobectomy group (9.4%), 4 in the segmentectomy group (2.2%). In the univariate analysis, there was a significant difference in the following items. Age ( $p = 0.0002$ ), preoperative CEA ( $p = 0.0009$ ), %FEV1.0 ( $p = 0.018$ ), clinical stage ( $p = 0.0004$ ), surgical mode ( $p = 0.0012$ ), operative time ( $p = 0.006$ ), amount of bleeding ( $p = 0.028$ ), mediastinal lymph node dissection ( $p = 0.019$ ). In multivariate analysis, age ( $p = 0.0027$ , HR: 2.530, CI: 1.381-4.636), surgical mode (lobectomy vs segmental resection,  $p = 0.0479$ , HR: 3.429, CI: 1.012-11.624) was significant predictors of postoperative atrial fibrillation.

**Conclusion:**

Postoperative atrial fibrillation was significantly less in segmentectomy compared with lobectomy. Sublobar resection is likely less impact on hemodynamics compared with lobectomy.

**Disclosure:** No significant relationships.

**P-179****USEFULNESS OF THE TUMOUR MARKER INDEX AS A PROGNOSTIC PREDICTOR OF STAGE I NON-SMALL CELL LUNG CANCER**Gaku Yamaguchi*Department of Thoracic Surgery, Tokyo Medical University Hospital, Tokyo, Japan***Objectives:**

Preoperative serum carcinoembryonic antigen (CEA) and cytokeratin-19 fragment (CYFRA) levels were reported to be prognostic factors for non-small cell lung cancer (NSCLC). However, no study has sufficiently examined a combination of two or more markers as prognostic predictors. In this study, we have used the tumour marker index (TMI) proposed by Muley et al. to examine whether a combination of multiple tumour markers could be a preoperative prognostic predictor.

**Methods:**

Between January 2006 and December 2009, 346 (76.2%) patients who underwent complete resection of stage I NSCLC and whose CEA and CYFRA levels had been measured, were selected as subjects for our study. This included 199 men and between 35 and 86 years old (median, 67). Out of these, 281 patients had adenocarcinoma, respectively. The CEA levels were from 0.2 to 137 (cut-off value, 5); CYFRA levels were from 0.1 to 212 (cut-off value, 3.3); the mean postoperative follow-up period was 1721 days (range, 1 to 4551 days); and the 5-year survival rate was 85.0%. TMI was calculated using a formula of  $\sqrt{(CEA \text{ level}/5) \times (CYFRA \text{ level}/3.3)}$ . Clinicopathological factors other than tumour markers were examined and a prognostic analysis of postoperative overall survival was performed.

**Results:**

A receiver operating characteristic curve of TMI was plotted and examined using 0.5 as a cut-off value, which indicated that a TMI greater than 0.5 was a poor prognostic factor ( $p = 0.001$ ). Patients with a high TMI levels, who had normal CEA and CYFRA levels is also a poor prognostic factor ( $p = 0.001$ ). A multivariate analysis was performed on other poor prognostic factors, and the results revealed that TMI is an independent poor prognostic factor (HR= 1.966; 95%CI, 1.031 to 3.752;  $p = 0.040$ ).

**Conclusion:**

The study demonstrated that high TMI level is a poor prognostic factor that can be evaluated preoperatively.

**Disclosure:** No significant relationships.



P-180

**THE HAZARD PATTERN OF TUMOR RECURRENCE IN NON-SMALL CELL LUNG CANCER PATIENTS**Yoshikane Yamauchi<sup>1</sup>, T. Muley<sup>2</sup>, S. Safi<sup>1</sup>, H. Dienemann<sup>1</sup>, H. Hoffmann<sup>1</sup><sup>1</sup>*Thoracic Surgery, Thoraxklinik Heidelberg, Heidelberg, Germany*<sup>2</sup>*Translational Research Unit, Thoraxklinik Heidelberg, Heidelberg, Germany***Objectives:**

The benefits of screening for non-small cell lung cancer (NSCLC) have been established for high-risk individuals, but the optimal post-treatment surveillance strategy remains unclear due to the lack of clinical evidence. The aim of this study was to investigate the hazard function of tumor recurrence in completely resected NSCLC patients.

**Methods:**

The risk of recurrence at a given time after operation was studied from a prospectively maintained institutional NSCLC database utilizing the cause-specific hazard function. Recurrence was categorized as local recurrence or distant recurrence. The risk distribution was assessed by the clinical and pathological factors.

**Results:**

A total of 1374 patients treated between 2003 and 2009 with complete resection followed by lymph node dissection were studied. Recurrence was detected in 501 patients (36.5%); local recurrence in 133 patients, distant recurrence in 312 patients, and both recurrence in 56 patients. The hazard function for recurrence presented an early peak at about 10 months after surgery, continuing a tapered plateau-like tail extending up to 8 years. A similar risk pattern was detectable for both local recurrence and distant recurrence, while the risk of distant recurrence is higher than that of local recurrence. The double-peaked pattern of hazard risk was present in several subgroups, such as p-Stage IA patients. The comparison of histology and status of nodal involvement showed that pN1-2 adenocarcinoma patients had a huge hazard risk of distant recurrence and that pN0 adenocarcinoma patients had a small recurrent risk for a longer time, although squamous cell carcinoma patients had little difference of the risk.

**Conclusion:**

The curve shape of recurrence hazard rate was changed dramatically, depending on the factors in background. The variety of the curve may be a good indicator to make a tailor-made protocol for the patients' follow-up.

**Disclosure:** No significant relationships.

P-181

**COMPARISON OF PERIOPERATIVE OUTCOME AFTER UPPER LOBECTOMY ACCORDING TO PRESERVATION OR DIVISION OF THE INFERIOR PULMONARY LIGAMENT IN LUNG CANCER SURGERY**Eunjue Yi<sup>1</sup>, Y. Seok<sup>2</sup>, D. Kim<sup>1</sup>, M.K. Bae<sup>1</sup>, S. Cho<sup>1</sup>, S. Jheon<sup>1</sup>, K. Kim<sup>1</sup><sup>1</sup>*Department of Thoracic and Cardiovascular Surgery, Seoul National University Bundang Hospital, Seongnam-si, Korea*<sup>2</sup>*Department of Thoracic and Cardiovascular Surgery, Kyungpook National University Medical Center, Dae-gu, Korea***Objectives:**

It is uncertain whether the division of the inferior pulmonary ligament is necessary in non-small cell lung cancer (NSCLC) patients who undergo upper lobectomy. The aim of this study is to investigate the relationship between the division of the inferior pulmonary ligament and postoperative complications.

**Methods:**

Medical records of 72 NSCLC patients who underwent video-assisted thoracic surgery upper lobectomy between March 2012 and November 2013 by a single thoracic surgeon were reviewed retrospectively. Patients were categorized into two groups, the division group, who underwent division of inferior pulmonary ligament, and the preservation group who did not. Total 43 patients belonged to the division group (27 right, 16 left), and 29 patients to the other group (11 right, 18 left). Postoperative outcomes including the presence of pleural effusion, duration of indwelling chest tube, changes in angles and changes in diameters of remnant bronchus were compared.

**Results:**

The duration of total indwelling chest tube, duration of chest tube drain amount more than 200ml, and the presence of pleural effusion in chest X-ray taken 1 month after the operation had no significant differences between the two groups (p-value = 0.07, 0.033, and 1.00 respectively). There were also no statistical significant differences in the presence of apical dead space or changes of bronchial angles between the two groups (p-value = 0.22, 0.74). Changes in diameter of RML bronchus showed no significant differences between two groups (p-value = 0.397). Changes in diameter of LLL bronchus also showed no significant differences (p-value = 0.977). No significant differences found in postoperative outcomes between the two groups.

**Conclusion:**

The benefit or disadvantages followed by division of inferior pulmonary ligament were unclear. No evidence found that this procedure might be related with critical postoperative complications.

**Disclosure:** No significant relationships.



P-182

**ENDOBRONCHIAL RUPTURE OF HYDATID CYST**Khaled Alkattan<sup>1</sup>, M. Ashour<sup>2</sup>, W. Saleh<sup>2</sup><sup>1</sup>*Thoracic Surgery, Alfaisal University, College of Medicine, Riyadh, Saudi Arabia*<sup>2</sup>*Thoracic Surgery, King Faisal Specialist Hospital, Riyadh, Saudi Arabia***Objectives:**

Endobronchial rupture of hydatid cyst may cause significant morbidity and mortality, the study was designed to identify the risk factors associated with such presentation.

**Methods:**

Prospective investigations and data collection were performed on 36 consecutive patients presented with either intact pulmonary hydatid cyst (n=20) group 1, or with endobronchial rupture, (n=16) group 2. In addition to the demographic data, radiological findings of the cyst size and site, the intraoperative findings of the feeding bronchus diameter and the postoperative histopathology of the wall were recorded and analysed.

**Results:**

There were 24 men and 12 women with a mean age of 32 years (range 9-65), 70% in the right lung and 60% in the lower lobes. The 2 groups were similar in the demographic data. In group 1 there were 22 cysts ranged between 2-10 cm in diameter (mean of 6) while in group 2, 16 cysts with a diameter ranged from 4-15 cm (mean of 9) (P<0.001). 20% and 60% were centrally located in both groups respectively. The bronchial fistula was less than 1 mm in all group one while in group 2, the mean diameter of the main feeding fistula was 6.1 mm (P<0.0001). The endocyst wall of the ruptured group showed significant absence of elastic tissue in comparison to intact cysts.

**Conclusion:**

Centrally located cysts are expected to be fed by larger bronchus and that would exert a higher force on the cyst wall. This may explain the mechanism of spontaneous rupture and may warrant earlier surgical intervention.

**Disclosure:** No significant relationships.

P-183

**BRONCHOSCOPIC LUNG VOLUME REDUCTION WITH COILS FOR END-STAGE CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A SINGLE INSTITUTION EXPERIENCE**

Korkut Bostancı<sup>1</sup>, Z. Bilgi<sup>1</sup>, H. Ömercikoğlu<sup>1</sup>, S. Olgun<sup>2</sup>, Ç. Çetinkaya<sup>1</sup>, N.O. Ermerak<sup>1</sup>, E. Eryüksel<sup>2</sup>, M. Yuksel<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, Marmara University Faculty of Medicine, Istanbul, Turkey*

<sup>2</sup>*Department of Pulmonary Diseases, Marmara University Faculty of Medicine, Istanbul, Turkey*

**Objectives:**

Over the last decade, several bronchoscopic lung volume reduction (BLVR) techniques for end-stage chronic obstructive pulmonary disease (COPD) have been developed with variable success rates. In this report we present our institution's experience with lung volume reduction coils (LVR-coils) for the treatment of end-stage COPD.

**Methods:**

All patients who underwent BLVR with LVR-coils since April 2013 were recorded in a prospective database. Age, gender, pulmonary function tests, postoperative morbidity, mortality, pre and postoperative (6 months) 6-minute-walking-tests (6MWT), mMRC scores, hospital anxiety and depression scale (HADS) scores were recorded. Pre and postoperative means were compared with paired T test, using SPSS 20.0 software.

**Results:**

Between April 2013 and October 2014, 46 patients (45 male, 1 female) underwent 57 BLVR with LVR-coils (11 patients had bilateral coils). Mean age was 61 (StD=8), patients had average 65 pack-years of smoking history. Pre and postoperative functional studies are shown in Table 1. Average of 10 (9-15) coils were placed per lobe (right upper=33, left upper=18, right lower=2, left lower=4). Mean follow up time was 12 months (+/-5) while no immediate major postoperative complications occurred, 3 patients experienced COPD exacerbation and 2 had pneumonia within 30 days of their procedures. One patient died at 6<sup>th</sup> month, due to complications from lung transplantation procedure.

**Conclusion:**

Lung volume reduction coils offer satisfactory end-stage COPD palliation/stablization for appropriate patients with lower morbidity and mortality rates than conventional lung volume reduction surgery. Bronchoscopic lung volume reduction with LVR-coils leads to significant improvement in quality-of-life and comparable improvement in objective functional measurements.

Table 1. Pre operative and 6<sup>th</sup> month postoperative functional studies

	Preoperative	Postoperative	p value
Residual Volume Percentage	203% (+/- 25%)	195% (+/-24%)	P<0,001
FEV <sub>1</sub> (Lt)	0,84 (+/-0,3) 29% (+/-12 %)	0,93 (+/- 0,3) 31% (+/-13%)	P<0,05
6MWT (meter)	241 m (+/- 96 m)	298 m (+/- 112 m)	P<0,001
mMRC score	3,1 (+/-0,8)	1,8 (+/- 0,9)	P<0,001
CAT score	24 (+/-6,8)	17(+/-8,4)	P<0,001
HADS Anxiety score	10 (+/-6,7)	6 (+/-3,4)	P<0,001
HADS Depression Score	9 (+/-3,5)	6 (+/-4,3)	P<0,001

**Disclosure:** No significant relationships.

P-184

**HOW ACCURATE IS THE PREOPERATIVE RESECTION PLAN COMPARED TO INTRAOPERATIVE DECISION? ANALYSIS OF 600 PULMONARY RESECTIONS**

H. Melek, A.S. Bayram, M.M. Erol, G. Cetinkaya, Cengiz Gebitekin  
*Thoracic Surgery, Uludag University Faculty of Medicine, Bursa, Turkey*

**Objectives:**

Although the number of investigations is carried out in the preoperative setting, there is no literature about the accuracy of preoperative decision in patients undergoing lung resection with or without neoadjuvant treatment. We aimed to evaluate the accuracy of preoperative decision regarding lung resection and determine the factors effecting the intraoperative changing of the planned resection.

**Methods:**

This prospectively recorded study was retrospectively evaluated that includes the report of 600 patients undergoing anatomical lung resection between 2009 and 2014. Patients who had more than one possibility of decision were excluded from the study. Thus 417 patients were included into study. The reason for resection was malignant in 336 patients. These patients were evaluated with their latest result of bronchoscopy, radiological and nuclear medicine investigations. The final evaluation was done by two experienced surgeons either together or individually and the planned type of resection was recorded in the operating list. We compared the preoperative decision with the intraoperative decision and evaluated the factors that influenced intraoperative plan changing.

**Results:**

Preoperative decision of the lung resection was segmentectomy in 47, lobectomy in 266, extended lobectomy in 67 and pneumonectomy in 37 patients. The type of resection was successfully predicted in 81% of the patients. The prediction for segmentectomy, lobectomy, extended lobectomy and pneumonectomy was 83,8%, 81,9%, 72%, 76,9% respectively ( $p=0,2$ ). The alteration of decision was significantly higher in patients with malignant tumors, 7% (benign) vs 22% (malignant),  $p=0,001$  and was the highest in patients who had neoadjuvant treatment, 26%,  $p<0,001$ . Positive surgical margin and fissure invasion were the most important factors affecting the changing of preoperative decision.

**Conclusion:**

Type of pulmonary resection in the light of preoperative investigations cannot be predicted accurately. The decision fails to predict the expected type of resection at least one in four patients undergoing lung resection for malignant tumors.

**Disclosure:** No significant relationships.





P-185

**5-YEAR EXPERIENCE WITH MOBILE ADULT ECMO IN A TERTIARY REFERRAL CENTRE**

R. Vaja<sup>1</sup>, Vijay Joshi<sup>1</sup>, I. Chauhan<sup>1</sup>, R. Porter<sup>2</sup>, M. Hickey<sup>2</sup>, G. Faulkner<sup>2</sup>, C. Harvey<sup>2</sup>

<sup>1</sup>Cardiac Surgery, Glenfield Hospital, Leicester, United Kingdom

<sup>2</sup>Heartlink ECMO Center, Glenfield Hospital, Leicester, United Kingdom

**Objectives:**

Mobile ECMO can be risky and is reserved for critically unstable patients that may not otherwise survive transfer to the ECMO centre. We have extensive experience with ECMO and have put over 2000 patients on ECMO since 1989. We describe our experience with our mobile service.

**Methods:**

We retrospectively reviewed adult patients between 2010–2014 who were referred for ECMO support and were too unwell to transfer directly to our centre. They were cannulated at their referring centre by our mobile ECMO team and subsequently transported back to our hospital on ECMO.

**Results:**

In total, 101 adult patients were put on ECMO by our mobile service of which 82 patients were transferred back to our centre. 76/82 patients (92.7%) were managed on ECMO for respiratory support, 3/82 patients (3.6%) for haemodynamic support and 3/82 patients (3.6%) for both. 22/101 patients (21.8%) travelled by air with a mean distance of 510 miles (SD  $\pm$  327, range 177 – 980). 72/101 patients (71.3%) travelled by road with a mean distance of 84.5 miles (SD  $\pm$  43.7, range 3.6- 187) and 3 patients (2.9%) were transported by a combination of both. A double lumen Avalon cannula was utilised in 68 patients (82.9%). One patient had a VT arrest during cannulation but was successfully resuscitated. There was no mortality or major complications during transfer.

**Conclusion:**

The use of mobile ECMO in adult patients is a safe modality for transfer of critically unwell patients. We have safely used double lumen cannulas in the majority of these patients.

**Disclosure:** No significant relationships.

**P-186****POSITIVE IMPACT OF AN ENDOBRONCHIAL VALVE PROGRAMME AND DEDICATED MULTIDISCIPLINARY TEAM ON RATES OF LUNG VOLUME REDUCTION SURGERY**

P. Tcherveniakov, C. Bogdan, Manos Kefaloyannis, A. Brunelli, R. Milton, K. Papagiannopoulos, N. Chaudhuri

*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

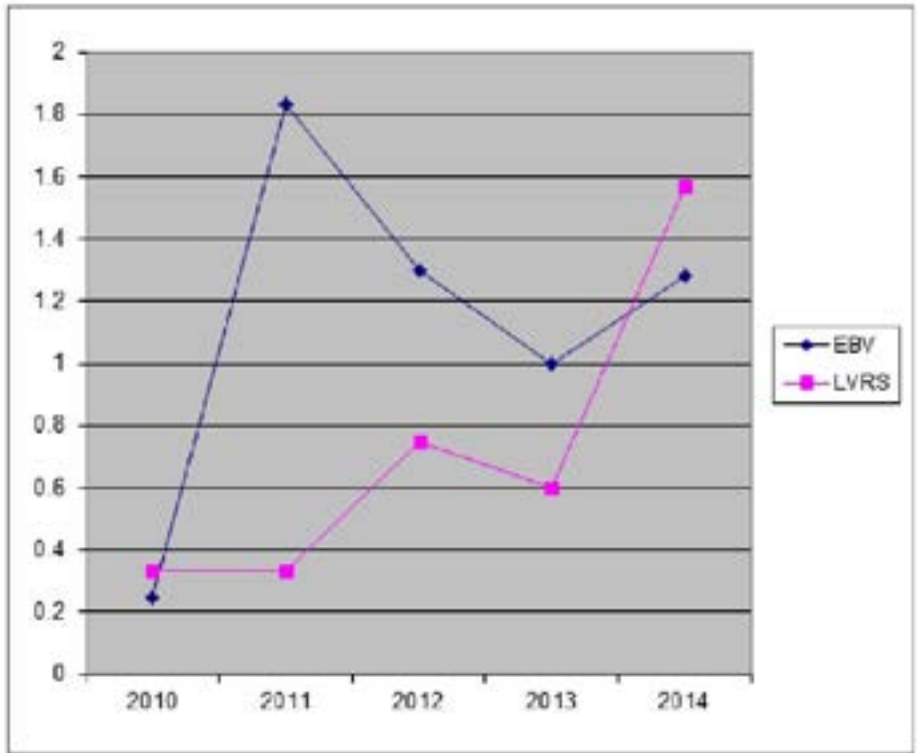
An endobronchial valve (EBV) implantation programme for patients with COPD started in our Thoracic Surgical Unit in 2010. Given the need for careful patient selection, a dedicated multidisciplinary team meeting (MDT) was established in the beginning of 2014. Core members of the MDT include thoracic surgeons, radiologist and respiratory physicians with an interest in COPD. We analysed the initial impact of the MDT on our activity.

**Methods:**

Retrospective analysis of the departmental database to identify patients who underwent EBV implantation and LVRS between 2006 and 2014 was performed.

**Results:**

Over the entire period 89 patients (56 male, 33 female with mean age 57.62 years) underwent a total of 108 procedures. The mean number of EBV procedures per month increased from 0.25 in 2010 to 1.28 in 2014, with a peak of 1.83 in 2011. Between 2006 and 2009 only 5 LVRS were performed. We observed an overall increase in the number of LVRS since 2010 (Graph). However, since the introduction of a dedicated MDT in 2014 the rate of LVRS procedures performed per month increased significantly from 0.6 in 2013 to 1.57 ( $p=0.04$ ).

**Conclusion:**

EBV implantation for palliation of severe COPD has become the endobronchial treatment of choice over the last 5 years. As the success of this procedure depends on rigorous selection criteria, introduction of a dedicated MDT is a logical step. Our initial experience shows that an EBV programme in general and the MDT in particular, can have an incremental effect on the rates of LVRS performed.

**Disclosure:** No significant relationships.

**P-187****NEGATIVE PRESSURE WOUND THERAPY IN A POTENTIALLY INFECTED WOUND AFTER EMPYEMA SURGERY**V. Zotes, Jose M Mier, G. Cortes*Thoracic Surgery, Instituto Nacional de Enfermedades Respiratorias, Mexico City, Mexico***Objectives:**

Thoracotomy wounds after empyema surgery inherently have their complications. Localized infections, wound dehiscence, and excessive wound leakage can be devastating to the patient with a prolonged recovery, but it is also costly to the hospital with an increased length of stay, extra workload, and dressing changes. The single use PICO (Smith and Nephew Healthcare, Hull, United Kingdom) negative pressure wound therapy (NPWT) dressing has revolutionized the management of various acute, chronic, and high output wounds.

**Methods:**

In a prospective, randomized, comparative study twenty patients with a Light 5-7 empyema were operated, since oct-dec 2014. Ten patients wounds were considered suitable for PICO application. Ten patients were treated with the traditional wound care. The follow up after surgery was 10 days. The wound complications risk were considered: diabetes, nutritional status, steroids therapy, prolonged surgery >2hrs.

**Results:**

15 males, 5 female. Mean age 47years. 90% in the PICO's group presented at least 1 risk factor, 80% in the conventional group. 50% in the PICO's group present any complication only 10% patients in the conventional group, relative risk value 5, IC 95% with no statistical significancy. The more common complication in the PICO's group was seroma 30%, wound abscess 20%, wound dehiscence 10%. In the conventional group wound dehiscence 20%. The hospital length stay was similar in both groups.

**Conclusion:**

The application of a disposable NPWT in the potentially infected wounds after empyema surgery not offer any benefit.

**Disclosure:** No significant relationships.

P-188

**THE BENEFITS OF THE DIGITAL CHEST DRAINAGE AFTER PLEURO-DECORTICATION IN EMPYEMA. PROSPECTIVE, COMPARATIVE RANDOMIZED TRIAL**

Jose M Mier, J.A. Berrios, G. Cortes

*Thoracic Surgery, Instituto Nacional de Enfermedades Respiratorias, Mexico City, Mexico***Objectives:**

Persistent air leaks represent the most common pulmonary complication after empyema-pleuro-decortication. Since there are insufficient data in the literature regarding variability in the withdrawal of postoperative pleural drainages in pleuro-decortication, we have designed a prospective, comparative and randomized study to evaluate if the use of digital chest drainage to measure postoperative air leak compared to a classic device varies on deciding when to withdraw chest tubes and it diminished the complications and reoperation after pleuro-decortication.

**Methods:**

A prospective, comparative and randomized trial was conducted in 37 patients who underwent pleuro-decortication in empyema. Since may-dec 2014. Male 27, female 10; mean-age 48years. We compared the use of digital devices with the current analogue version. The digital and analogue group had 18 and 19 patients, respectively. The surgery was indicated when the empyema was 5-7grade (Light Classification). The measure of the air leak in the digital group was in ml/min, in the analogic group we perform the conversion between the bubbles scale (0-5) to ml/min. We compare the number of complication and reoperation cases in both groups and the day to withdraw the chest tube.

**Results:**

Clinical population data and Light Classification were not statistically different between the groups. Thoracotomy approach 94.6%, VATS 5.4%. The immediate postoperative air leak was in the 96% of the patients. The withdrawal of the chest tube in the Digital group 4.5 days; analogic 5.5 days ( $p=0.49$ ). The postoperative complication between digital and analogic groups were 22.2% vs 36.8% ( $p=0.37$ ). The reintervention was necessary in 16.67% vs 26.31% ( $p=0.09$ ).

**Conclusion:**

The use of digital chest drainage in pleuro-decortication reduce the reoperation cases. We observe a tendency to reduce the air leak and the chest tube necessity in the digital group, but probably we need a large series for confirm this point.

**Disclosure:** No significant relationships.

P-189

**COMPLETION PLEUROPLEURONECTOMY IN PATIENTS WITH MULTIDRUG-RESISTANT/EXTENSIVELY DRUG-RESISTANT LUNG TUBERCULOSIS**

Nikolay Opanasenko<sup>1</sup>, A. Kshanovsky<sup>1</sup>, B. Konik<sup>1</sup>, L. Levanda<sup>2</sup>, T. Stasiv<sup>2</sup>

<sup>1</sup>*Thoracic Surgery and Invasive Diagnostic Methods, National Institute of Phthisiology and Pulmonology named after F.G. Yanovsky NAMS of Ukraine, Kiev, Ukraine*

<sup>2</sup>*Anesthesiology, National Institute of Phthisiology and Pulmonology named after F.G. Yanovsky NAMS of Ukraine, Kiev, Ukraine*

**Objectives:**

Completion pleuropneumectomy (CPPE) is a surgical intervention which includes final removal of residual part of the previously resected lung and parietal pleura due to progression of the MDR/XDR (Multidrug-resistant/extensively drug-resistant) tuberculous process despite medicinal treatment. We assessed the effectiveness of CPPE for MDR/XDR pulmonary tuberculosis.

Completion pleuropneumectomy (CPPE) is a surgical intervention which includes final removal of residual part of the previously resected lung and parietal pleura due to progression of the MDR/XDR tuberculous process despite medicinal treatment. The role of this study is to assess the effectiveness of CPPE for MDR/XDR pulmonary tuberculosis.

**Methods:**

From 2004 to 2014, 20 CPPE was performed for MDR/XDR pulmonary tuberculosis in our institution. The number of males and females was the same. Mean age was 29.2 years (range 17–42). Mean period from the diagnosis of the tuberculosis to CPPE was 55.9 months (range 24–108). Mean period from the primary resection to CPPE was 27.8 months (range 14–71). Before CPPE next surgical interventions had been performed: upper lobectomy – 10 (50.0%) cases; segmentectomies – 7 (35.0%) cases; lower lobectomy, upper and lower bilobectomy – in 1 (5.0%) case each. Before CPPE next morphological forms of pulmonary tuberculosis was diagnosed: fibrocavernous – in 14 (70.0%) patients, cirrhotic – in 5 (25.0%) cases, and in 1 (5.0%) case a caseous pneumonia. 2 (10.0%) patients had residual pleural cavity. The survival was analyzed by using Kaplan-Meier method.

**Results:**

Mean intraoperative blood loss was 390.8±65.6 ml (range 150.0–1500.0). Mean operation time was 267.0±11.8 min (range 159–360). Mean duration of hospital stay was 50±7.7 days (range 27–181). Intraoperative complications were diagnosed in 2 (10.0%) interventions. There was no hospital mortality. Late postoperative complications were diagnosed in 4 (20.0%) patients: 2 (10.0%) cases of bronchopleural fistula, 1 (5.0%) case of empyema of residual pleural cavity without insufficiency of the bronchial stump, 1 (5.0%) case of progressing of tuberculous process in another lung. The overall effectiveness of the CPPE in a late period was 85.0%, ten-year survival – 79.5%.



**Conclusion:**

CPPE is a traumatic and technically difficult but highly effective surgical intervention in patients with MDR/XDR pulmonary tuberculosis.

**Disclosure:** No significant relationships.

## P-190

**BRONCHOSCOPIC LUNG VOLUME REDUCTION WITH ENDOBRONCHIAL VALVES AFTER PREVIOUS LUNG VOLUME REDUCTION SURGERY IS A VALID OPTION**

Amit Paik, R. Bilancia, A. Sharkey, I. Oey, S. Rathinam, D. Waller  
*Thoracic Surgery, Glenfield Hospital, Leicester, United Kingdom*

**Objectives:**

We are performing lung volume reduction (LVR) as a staged procedure. The timing of the second stage is determined by the patients' perception of symptoms. With the more recent development of bronchoscopic techniques, some of our patients proceeded to an endobronchial valve (EBV) insertion as their second procedure. The general perception is not to insert an EBV after previous thoracic surgery, including lung volume reduction surgery (LVRS), due to the possible risk of complications. We wanted to evaluate our patients who had EBV after previous LVRS.

**Methods:**

We have performed EBV LVR after previous LVRS in nine patients and have prospectively collected data on physiological, nutritional and health status (Euroquol (EQ)) parameters. The operative mortality risk score was calculated using the Glenfield score (based on FEV1, DLCO and BMI). Nine further patients who had staged LVRS were matched by gender and age and compared with the EBV group.

**Results:**

Four patients had EBV on the same side as their previous LVRS, these patients had no suitable target areas or had collateral ventilation between adjacent lobes on the contra-lateral side. Five patients had EBV on the contra-lateral side of LVRS. These patients chose the less invasive procedure after full informed consent. The preoperative FEV1, EQ score, Glenfield score were similar in the two groups. Length of stay (LOS) was significantly shorter in the EBV group. In the EBV group one patient died within 30 days of surgery. No patients after EBV developed either haemo or pneumothorax.

	EBV (2 <sup>nd</sup> Stage)	LVRS (2 <sup>nd</sup> stage)	p
Age (years) Median (range)	64 (49-74)	66 (49-67)	NS
FEV1 (litres) Mean (SD)	0.86 (0.43)	0.96 (0.52)	NS
Glenfield Score	5 low risk 4 moderate risk	6 low risk 3 moderate risk	NS
EQ Mean (SD)	55 (22)	65 (10)	NS
LOS (days) Median (range)	1 (1-2)	12 (4-34)	p<0.0004
Airleak (days) Median (range)	0	8 (3-42)	P<0.002

**Conclusion:**

The development of bronchoscopic techniques widens the options of LVR. Previous surgery does not exclude subsequent EBV use, enabling patients to have a third or even fourth stage LVR.

**Disclosure:** No significant relationships.





P-191

**PRE-OPERATIVE PEAK WORKLOAD AS PREDICTOR OF POST-OPERATIVE COMPLICATIONS IN PATIENTS UNDERGOING PULMONARY RESECTION FOR LUNG CANCER**

C. Martin, E. Curto, A. Rodó, R. Aguiló, Albert Rodriguez, J. Gea, D. Rodríguez  
*Thoracic Surgery, Hospital del Mar, Barcelona, Spain*

**Objectives:**

A pre-operative incremental cardio pulmonary exercise test (CPET) is a key-point in evaluating the surgical risk in patients considered for pulmonary resection for lung cancer (LC). Maximum oxygen (O<sub>2</sub>) delivery to tissues (VO<sub>2</sub>max) is the variable commonly used. Peak workload (WR<sub>peak</sub>) is also routinely measured during a CPET. We hypothesized that WR<sub>peak</sub> might also be useful in evaluating the surgical risk.

**Methods:**

We retrospectively studied from a prospective data-base all consecutive patients that underwent surgery for LC with curative intention (years 2009-13). Pre-operative evaluation of the surgical risk was performed as recommended by international guidelines. WR<sub>peak</sub> was measured in Watts (Ws).

**Results:**

Patients included were 156, (101 lobectomies); 87% male; age, 66 (8) [mean (SD)] years; FEV<sub>1</sub> 60 (15)%; DLCO 59 (24)%. Fifty (32%) patients presented post-operative complications; respiratory, 16 (10%); cardiac, 32 (20%). Pre-operative VO<sub>2</sub>max and WR<sub>peak</sub> well correlated, r<sup>2</sup>=0.65 (p=0.001). When patients with a lower *versus* higher than 60 Ws pre-operative WR<sub>peak</sub> were compared, significant differences in pre-operative VO<sub>2</sub>max were also observed, 15 (2) and 17 (5) ml/kg/min, respectively, p=0.001. A pre-operative WR<sub>peak</sub> < 60 Ws was an independent factor of risk to present post-operative complications, RR (IC 95%) = 2,95 (1,3-6,5) p=0,008.

**Conclusion:**

Pre-operative WR<sub>peak</sub> was a good predictor of post-operative complications after pulmonary resection for LC. Our results deserve further investigations, as if pre-operative WR<sub>peak</sub> might replace pre-operative VO<sub>2</sub>max as marker of surgical risk, it would greatly facilitate a widespread performance of CPETs due to the non-invasiveness of the test.

**Disclosure:** No significant relationships.

**P-192****EVOLUTION AND RISK FACTORS FOR EARLY MORTALITY AFTER LUNG TRANSPLANTATION FOR IDIOPATHIC PULMONARY FIBROSIS. AN EXPERIENCE OF 20 YEARS**

Elisabet Arango Tomas, F.J. Algar Algar, F. Cerezo Madueño, A. Alvarez, C. Baamonde Laborda, A. Salvatierra Velázquez

*Thoracic Surgery and Lung Transplantation Unit, University Hospital Reina Sofia, Cordoba, Spain*

**Objectives:**

High early mortality after transplantation for IPF is still not well-controlled and some different aspect remains debated. The aim of this study is to evaluate our 20 years experience to identify factors that might improve the early outcomes.

**Methods:**

From January 1994 to December 2014, 117 IPF patients underwent lung transplantation at our department. Preoperative and postoperative characteristics were compared using Student's test and Chi-Square tests. Significant variables on univariate analysis were entered into a stepwise logistic regression.

**Results:**

Complete data was obtained on 427 patients transplanted from October 1993 along 20 years. Among the 117 IPF subjects the types of transplantations were: 98 (83.8%) single transplant (31 left and 67 right) and 19 (16.2%), double transplant (double lung 18, double lobe 1). Using grafts from donors under 55 (69.2%), with  $paO_2/FiO_2 > 350$  (94.9%), and less than 3 days of intubation cutoff (69.2%). There were 25/117 acute rejections, 11/117 primary graft dysfunction, and 25/117 respiratory infections. Early mortality (one-month mortality) was 25/117 (21.4%).

Table 1.

	1994-1998	1999-2003	2004-2008	2009-2014
N	22	30	30	35
Men/ Women	17 / 5	18 / 12	25 / 5	28 / 7
Age	46 ± 12	53 ± 10	54 ± 10	55 ± 9
Recipients over 55	22.7% (5)	43.3% (13)	56.7% (17)	57.1% (20)
Waiting list (days)	81 [1-313]	149 [3-454]	145 [0-609]	288 [60-1095]
Corticotherapy	81.8%	29.6%	26.7%	37.1%
Single Lung	16/22 (72.7%)	24/30 (80%)	26/30 (86,7%)	32/35 (91,4%)
• Right	• 6 (27.3%)	• 15 (50%)	• 19 (63,3%)	• 27 (77,1%)
• Left	• 10 (45,4%)	• 9 (30%)	• 7 (23,3%)	• 5 (14,3%)
Double	6/22 (27,3%)	6/30 (20%)	4/30 (13,3%)	3/35 (8,6%)
• 2 lungs	• 6 (27.3%)	• 6 (20%)	• 4 (13,3%)	• 2 (5,7%)
• 2 lobes	• 0	• 0	• 0	• 1 (2,9%)
1° Graft Ischemia 2° Graft Ischemia	357 min 546 min	307 min 466 min	293 min 446 min	306 min 420 min
Early mortality	27,3% (6)	23,3% (7)	20% (6)	17,1% (6)
Early mortality by type of Tx (Single/Double)	5/1	6/1	6/0	6/0

Logistic regression analysis for early mortality was performed and multivariate analysis identified recipient age under 55 (p=0.042) [OR = 2.98], single lung transplants (p=0.001) [OR = 5.226], and prior corticosteroids treatment (p=0.05) [OR = 5.128] as independent risk factors for development of early mortality.

**Conclusion:**

Despite of the increasing age of transplant recipients, we observed a decrease in mortality of almost half compared to our initial results. According to our results, the mortality risk in patients under 55 years is independent of the type of transplant (single or double), being higher if a single transplant arises. In addition, it should be reduced the corticosteroids treatment in order to get lower early mortality.

**Disclosure:** No significant relationships.

**P-193****TRACHEAL RESECTION WITH PATIENT UNDER LOCAL ANESTHESIA AND SEDATION**

Francesco Paolo Caronia<sup>1</sup>, D. Loizzi<sup>2</sup>, A. Fiorelli<sup>3</sup>

<sup>1</sup>*Thoracic Surgery, Mediterranean Oncologic Institut, Catania, Italy*

<sup>2</sup>*Thoracic Surgery, University of Foggia, Foggia, Italy*

<sup>3</sup>*Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

**Objectives:**

General anesthesia and cross-table anesthetic technique have been the gold standard for tracheal resection and to end-to-end anastomosis until 2010 when Macchiarini reported a series of tracheal resections of non-intubated patients by using epidural anesthesia. Here we present a technique of tracheal resection and end-to-end anastomosis under monitored local anesthesia and sedation.

**Methods:**

Between July 2013 and August 2014, 3 patients were referred to our institution for post-intubation tracheal stenosis. All patients presented dyspnea, stridor and one patient had recurrent pneumonia. A computed tomography scan with 3D reconstruction confirmed a tracheal stenosis in all patients. They underwent tracheal resection in local anesthesia and sedation. Patients were positioned supine. Local anesthesia was obtained by the local infiltration of 2% lidocaine and 7.5 mg/L ropivacaine during the operation. During the procedure the patient remained awake in conscious sedation achieved by bolus of ketamine and midazolam. Another 2 ml of 2% lidocaine was used for endotracheal instillation over and under the stenosis. A cervical drain was positioned. An intra-operative fiberoptic control at the end of the procedure control demonstrated a patent endotracheal lumen.

**Video description:**

A 36-year old male, smoker was admitted to our department for dyspnea, stridor and recurrent pneumonia. A computed tomography scan with 3D reconstruction revealed a post-intubation tracheal stenosis. The patient was proposed for surgery in local anesthesia and sedation. The patient was positioned supine and at the skin incision was infiltrated with 2% lidocaine and 7.5 mg/L ropivacaine during the operation. During the entire procedure the patient remained awake in conscious sedation achieved by bolus of ketamine and midazolam. The patient underwent tracheal resection and end-to-end anastomosis in local anesthesia and sedation and no mechanical ventilation was required. A minitracheostomy was positioned for security reasons. Operative time was 155 min. Cervical drain was removed within the next 24 hours and the patient discharged home in POD-10.

**Results:**

There were 2 males and 1 female. Their median age was 51,6 yrs (range: 34-64 yrs). Patients underwent tracheal resection and end-to-end anastomosis in local anesthesia and sedation. The



average operative time was 153 mins (range: 140-170 mins); the average blood loss was 173,5 mL (range: 150-200 mL). Cervical drain was removed within the next 24 hours. The average hospitalitation was 10,6 days (range: 10-11 days). There were no complications. A fiberoptic bronchoscopy at three months showed no complications.

**Conclusions:**

Tracheal resection and end-to-end anastomosis in local anesthesia and sedation seems to be feasible and safe and probably represent the least invasive approach to tracheal resection in selected cases. Further studies are necessary to evaluate the results with a series of patients.

**Disclosure:** No significant relationships.

P-194

**ENDOBONCHIAL VALVES IN THE TREATMENT OF PERSISTENT AIR LEAK AND EMPYEMA AFTER LUNG RESECTION, A USEFUL TOOL FOR THORACIC SURGEONS. CASE REPORT.**

G. Cusumano, A. Terminella, I. Vasta, C. Riscica Lizzio, S. Bellofiore, R. Giuliano, R. Giarlotta, M. D'Arrigo, S. Saita  
*General Thoracic Surgery, Vittorio Emanuele Policlinico Hospital, Catania, Italy*

**Objectives:**

The air leak represents a challenge after lung surgery and its treatment is often difficult because of the impaired lung function and the anatomical conditions. Endobronchial valves were successfully employed to avoid surgical approach. We present a case of patient, who underwent atypical resection complicated by persistent air leak and empyema, successfully treated by endobronchial valves placement and intracavitary antibiotics infusion.

**Case description:**

A 72-year old patient, with severe lung heterogeneous emphysema, underwent double left lung resection for PET positive suspect lung nodule. Two days after surgery, an air leakage was evident with uncomplete pulmonary expansion albeit chest drain aspiration. Eight day after surgery, the patient complained of a fever associated with purulent pleural effusion. Microbiological cultures showed acinetobacter baumani and pseudomonas aeruginosa growing. Because the persistent leakage did not permit to the lung to occupy the pleural space and also was maintaining the communication with bronchial tree we decided to attempt endoscopic closure of the bronchial leakage. Two nitinol and silicone valves (Pulmonx®) were inserted by means of flexible bronchoscopy under conscious sedation on anterior and lateral segmental bronchi of left upper lobe. A preliminary bronchoscopy identified the air leak by bronchial occlusion using a balloon catheter. Within 24 hours air leak was completely stopped and left lung have completely filled the entire pleural space. During the following day patients was treated by intracavitary instillation of colistine by chest drain. Chest drain was removed 7 day after endobronchial valves placement , after negativity of microbiological essay from pleural liquid. CT scan and endoscopic controls confirmed two months after chest drain removal.

**Conclusion:**

Persistent air leak complicated by empyema often requires painful surgical solutions such as open window and thoracoplasty. Insertion of endobronchial valves can be used for treating persistent air leak and could accelerate healing of empyema as valid alternative to surgery.

**Disclosure:** All authors have declared no conflicts of interest.



P-195

**THE EFFECT OF RECIPIENT COMORBIDITIES ON OUTCOME AFTER LUNG TRANSPLANTATION: THE ZURICH RECIPIENT SCORE**

Ilhan Inci<sup>1</sup>, J. Ehrsam<sup>1</sup>, S. Hillinger<sup>1</sup>, I. Opitz<sup>1</sup>, D. Schneiter<sup>1</sup>, R. Schüpbach<sup>2</sup>, C. Benden<sup>3</sup>, W. Weder<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Zurich University Hospital, Zurich, Switzerland*

<sup>2</sup>*Surgical Intensive Care, University Hospital Zurich, Zurich, Switzerland*

<sup>3</sup>*Division of Pulmonary Medicine, University Hospital Zurich, Zurich, Switzerland*

**Objectives:**

The main purpose of lung transplantation is improved quality of life and long-term survival. The effect of recipient comorbidities in lung transplant recipients is not yet well investigated and studies about the independent impact of the accumulation of comorbidities in a single recipient are completely lacking.

**Methods:**

All 315 consecutive transplantations were retrospectively analyzed for eight risk factors; BMI  $\geq 30$ kg/m<sup>2</sup>, systemic hypertension, osteoporosis, cardiac disease, insulin dependent diabetes, renal dysfunction, diverticulosis and critical situation (such as ECMO, mechanical ventilation). The Zurich Recipient Score (ZRS) estimated the effect of multiple risk factors. The occurrence of each comorbidity was scored with one point.

**Results:**

The one- and 5 year survival rates for recipients without or one comorbidity (N=209) was significantly better than the recipients who had two or more comorbidities (N=106): 88% and 66% versus 78% and 49%, respectively (p=0.00 long rank test). In multivariate analysis the following comorbidities revealed as significant risk factors: systemic hypertension (N= 56, HR 1.52; 95%CI 1.01-2.29), cardiac disease (N=79, HR 1.72; 95%CI 1.20-2.45), diverticulosis (N=24, HR 1.89; 95%CI 1.07-3.33) and critical situation (N=36, HR 2.05; 95%CI 1.19-3.12). In a multivariate analysis ZRS  $\geq 3$  was tested with four other potential risk factors: intraoperative ECMO use, unilateral lung transplantation, IPF diagnosis and recipient age  $\geq 60$  years. In this model ZRS  $\geq 3$  was a significant risk factor for mortality (N= 35, HR 1.81; 95%CI 1.12-2.92).

**Conclusion:**

Recipients with multiple comorbidities have a decreased long-term survival. According to our data systemic hypertension, cardiac disease, diverticulosis and critical situation are independent risk factors for mortality. Especially, the accumulation of three or more risk factors in lung transplant candidate should be encountered in caution.

**Disclosure:** No significant relationships.

**P-196****PREDICTORS OF ATELECTASIS AFTER PULMONARY LOBECTOMY**

Hironori Ishibashi, Y. Nakashima, S. Baba, C. Takasaki, M. Kobayashi, K. Okubo  
*Thoracic Surgery, Tokyo Medical And Dental University, University Hospital of Medicine,  
Tokyo, Japan*

**Objectives:**

To define the incidence and factors of postlobectomy atelectasis (PLA).

**Methods:**

A retrospective study of 500 patients who underwent lobectomy at our institute between April 2010 and December 2014 was performed. PLA was defined as a chest computed tomography (CT) finding of a complete ipsilateral lobar collapse with whiteout of the involved lobe, with mediastinal shift requiring a bronchoscopic toilet. We divided our patients into those with PLA (PLA group) and those without PLA (non-PLA group). The following variables were considered in the analysis: age, sex, body mass index, respiratory functions (FEV1.0, FEV1.0%, VC, %VC), presence of chronic obstructive pulmonary disease (COPD), severity of emphysema (Goddard classification), smoking status, smoking index, cardiovascular complication, presence of mental disorder, American Society of Anesthesiology (ASA) performance status, type of lobectomy, surgical procedure (open thoracotomy vs. thoracoscopic surgery), operating time, blood loss, and pulmonary postoperative complications.

**Results:**

A total of 32 patients (6.4%) developed PLA, accounting for 31% of all pulmonary postoperative complications. There were no significant differences between the PLA and non-PLA groups in age, sex, ASA performance status, presence of COPD, smoking status, smoking index, cardiovascular comorbidity, surgical procedure, operating time, blood loss, and pulmonary postoperative complications. Goddard classification (5.8 vs. 0.9;  $p < 0.01$ ), mental disorder (12.5% vs. 0.6%;  $p < 0.01$ ), and right upper lobectomy (RUL) (43.7% vs. 21.4%;  $p = 0.0065$ ) were identified as preoperative variables predictive of PLA. RUL was complicated with PLA in 14% of patients.

**Conclusion:**

Patients with severe emphysema (Goddard classification), mental disorder, and those undergoing RUL are at high risk of PLA.

**Disclosure:** No significant relationships.



P-197

## SAFE TRANSITION FROM CARDIOPULMONARY BYPASS INTO EXTRACORPOREAL MEMBRANE OXYGENATION FOR INTRA-OPERATIVE CARDIOPULMONARY SUPPORT DURING LUNG TRANSPLANTATION

Hee Suk Jung, H.C. Paik, C.Y. Lee, S.J. Haam

*Department of Thoracic And Cardiovascular Surgery, Yonsei University College of Medicine, Seoul, Korea*

### Objectives:

The purpose of this study is to compare early postoperative outcomes and operative parameters of ECMO (Extracorporeal Membrane Oxygenation) versus CPB (Cardiopulmonary by-pass) in patients undergoing lung transplantation.

### Methods:

Between January 2010 and August 2014, 72 patients received lung transplants with 60 patients requiring cardiopulmonary support (CPB group, n=26; ECMO group, n=34) in our institution. We evaluated the incidences of bleeding complication, perioperative transfusion, graft rejection, and survival in these two study groups.

### Results:

There was no significant statistical difference between two groups in patient demographics including sex, age, ABO type, NYHA functional class, waiting time, lung function and preoperative ventilator care or ECMO support. Although the amount of blood loss ( $633.3 \pm 1003.9$  vs  $3750.0 \pm 4050.8$ ;  $P=0.001$ ) during transplantation was more in ECMO group, the operation time and blood product transfusion during the procedure was not significantly different between the two groups. Post-operatively, the CPB group received more transfusion of red blood cell ( $11.5 \pm 9.7$  vs  $5.8 \pm 7.3$  U), fresh frozen plasma ( $9.3 \pm 8.5$  vs  $4.0 \pm 6.4$  U), and platelet concentrate ( $23.0 \pm 17.1$  vs  $11.3 \pm 12.0$  U) within the first 48 hours, but showed no statistically significant differences. Postoperative outcomes including re-operation for bleeding, the need for hemodialysis, re-insertion of ECMO, and the rate of graft rejection also showed no differences between the two groups. Primary graft dysfunction score of grade 3 on the 3<sup>rd</sup> postoperative day, early ( $\leq 30$  days) mortality and 90 day mortality occurred less frequently in the ECMO group with statistically significant difference.

Table 1. Intra-operative and post-operative data

Variable	CPB (n=26)	ECMO (n=34)	P value
Transplantation			1.000
Single lung	3 (11.5%)	3 (8.8%)	
Double lung	23 (88.5%)	31 (91.2%)	
Postoperative ECMO	7 (26.9%)	14 (41.2%)	0.251
Lung volume reduction	7 (26.9%)	17 (50%)	0.071
Ischemic time (min)			
Left	311.6 ± 53.3	345.5 ± 78.9	0.080
Right	218.8 ± 63.3	255.7 ± 80.0	0.072
Single	217.0 ± 59.6	141.0 ± 0	0.386
Operation time (min)	456.4 ± 89.8	432.9 ± 90.2	0.320
Blood loss (cc)	633.3 ± 1003.9	3750.0 ± 4050.8	0.001
Intraoperative blood products			
PRBCs (U)	10.8 ± 8.5	8.7 ± 5.6	0.164
FFP (U)	5.2 ± 4.2	4.8 ± 3.9	0.206
PC (U)	8.0 ± 6.0	6.9 ± 5.4	0.574
Cryoprecipitate (U)	0.3 ± 1.6	0	
Re-operation for bleeding	9 (33.3%)	7 (20.6%)	0.697
Postoperative dialysis	9 (34.6%)	9 (26.5%)	0.495
Rejection (pulse therapy)	2 (7.7%)	6 (17.6%)	0.440
Secondary ECMO implantation	2 (7.7%)	1 (2.9%)	0.574
Tracheostomy	9 (34.6%)	10 (29.4%)	0.668
Pneumonia	8 (30.8%)	8 (23.5%)	0.530
Ventilation time (d)	18.4 ± 20.7	9.4 ± 6.1	0.238
30 day mortality (d)	10 (38.5%)	3 (8.8%)	0.006
90 day mortality (d)	11 (42.3%)	5 (14.7%)	0.017
ICU stay (d)	21.6 ± 19.1	11.3 ± 8.3	0.070
Postoperative transfusion for 48 hrs			
PRBCs (U)	11.5 ± 9.7	5.8 ± 7.3	0.109
FFP (U)	9.3 ± 8.5	4.0 ± 6.4	0.087
PC (U)	23.0 ± 17.1	11.3 ± 12.0	0.051
Cryoprecipitate (U)	2.7 ± 4.1	0	0.175
PGD score grade 3 at 72 hrs	4 (15.4%)	0	0.031
Discharge (d)	61.1 ± 57.2	42.2 ± 29.3	0.191

**Conclusion:**

In this study, early outcomes of ECMO support were comparable to those of CPB support during lung transplantation. Through these results, we could ascertain safe transitions from CPB into ECMO for intra-operative cardiopulmonary support during lung transplantation.

**Disclosure:** No significant relationships.

P-198

## PRELIMINARY PROSPECTIVE STUDY ON DOUBLE-LUMEN TUBE INTUBATION AND ONE-LUNG VENTILATION CONDITIONS IN THORACIC SURGERY: DO THEY IMPACT POSTOPERATIVE MORBIDITY?

Françoise Le Pimpec-Barthes<sup>1</sup>, C. Pricopi<sup>1</sup>, B. Chevalier<sup>1</sup>, J.C. Boucherie<sup>2</sup>, B. Grand<sup>1</sup>, P. Bagan<sup>1</sup>, J. Das Neves Pereira<sup>1</sup>, A. Badia<sup>1</sup>, A. Arame<sup>1</sup>, C. Rivera<sup>1</sup>

<sup>1</sup>Thoracic Surgery, Georges Pompidou European Hospital, Paris, France

<sup>2</sup>Anesthesiology, Georges Pompidou European Hospital, Paris, France

### Objectives:

In thoracic surgery, one-lung ventilation by double lumen tube represented a major improvement making possible complex procedures in optimal conditions and allowing the development of minimally invasive surgery. Our objective was to evaluate whether difficulties in double-lumen tube positioning could induce early postoperative morbidity.

### Methods:

Between April and December 2014, the patients who underwent thoracic surgery requiring selective intubation could be included in this prospective study. Incomplete medical files on studied criteria data, in particular tobacco weaning, were not included. We defined 2 groups of patients according to whether the process of double-lumen tube intubation and the fair quality of one-lung ventilation during surgery was difficult (Group 1) or not (Group 2).

### Results:

One hundred twenty seven patients, mean age 61.4 years (18.7 to 84.5) were thus included in the study. No significant difference was observed between the 2 groups regarding their comorbidities, functional characteristics and surgical procedures. A significant difference regarding the occurrence of early postoperative respiratory complications was observed between the 2 groups (33.3% in Group 1 vs 14.3% in Group 2,  $p = 0.011$ ) without significant impact on mortality (7% in Group 1 and 1.5% in Group 2,  $p=0.111$ ). More pneumonias were observed in Group 1 but it was not significant (24.6% vs 11.4%,  $p=0.052$ ). The limits of this study are the heterogeneity of surgical procedures, similar in the 2 groups, and the impossibility to include all the operated patients in the same period.

### Conclusion:

Double-lumen tube intubation is a routine procedure in thoracic surgery anaesthesiology. However, difficulties in positioning this type of tube may occur and potentially increase postoperative respiratory morbidity.

**Disclosure:** No significant relationships.

P-199

**AUTOFLUORESCENCE BRONCHOSCOPY IN LUNG TRANSPLANTATION**Mario Nosotti<sup>1</sup>, R. Carrinola<sup>1</sup>, L. Rosso<sup>1</sup>, A. Palleschi<sup>1</sup>, V. Rossetti<sup>2</sup>, L. Morlacchi<sup>2</sup><sup>1</sup>*Thoracic Surgery and Lung Transplantation, Fondazione Cà Granda Ospedale Maggiore Policlinico, Milan, Italy*<sup>2</sup>*Respiratory Medicine, Fondazione Cà Granda Ospedale Maggiore Policlinico, Milan, Italy***Objectives:**

Autofluorescence bronchoscopy was developed to discover preinvasive lesions, based on the fact that dysplasia shows less fluorescence than normal tissue when excited by blue light. Despite some questions about the origin of autofluorescence are left, the presence of good vascularization seems to be crucial. The aim of the present study was to evaluate the bronchial mucosa modification after lung transplantation by autofluorescence bronchoscopy.

**Methods:**

Consecutive patients receiving single or double lung transplantations were included. Patients requiring separate lung ventilation, long stay in the intensive care unit and/or in rehabilitation centers were excluded. The autofluorescence procedures, conducted with EVIS Lucera Spectrum AFI Olympus bronchoscope, were associated with planned bronchoscopic surveillance and transbronchial biopsies; the typical schedule included a bronchoscopy every seven days up to the 30<sup>th</sup> postoperative day followed by a procedure every three months to reach the twelve month follow-up. The autofluorescence bronchoscopies were recorded and pictures of the first bronchial bifurcations were analyzed with color histograms. Bright pink color was typical of ischemic mucosa (figure A), deep green was characteristic for normal mucosa (figure B); the red and green intensity ratio (R/G) was used to graduate the pictures. Total graft ischemic time and bronchial complications were correlated with the autofluorescence grading.

**Results:**

Thirty patients were included in the study. The immediate postoperative controls recorded the higher red intensity (mean R/G=1.87). The mucosa regained the normal green autofluorescence generally at the 30<sup>th</sup> day control (mean R/G=1.10). A correlation between higher graft ischemic time and low autofluorescence was noted; graft infection determined a delay in regaining normal autofluorescence. A patient, who presented a bright pink mucosa at the six month control (R/G=2.5), developed an intermediate bronchus stenosis.

**Conclusion:**

Autofluorescence bronchoscopy may control the airway revascularization after lung transplantation. Such non-invasive procedure may detect latent ischemic mucosa and predict stenosis formation.

**Disclosure:** No significant relationships.

P-200

**EARLY CESSATION OF PROPHYLAXIS MAY INCREASE THE INCIDENCE OF CYTOMEGALOVIRUS INFECTION AFTER LUNG TRANSPLANTATION**

Keiji Ohata, F. Chen, M. Takahashi, T. Kondo, H. Motoyama, K. Hijiya, T. Yamada, M. Sato, T. Menju, A. Aoyama, T. Sato, M. Sonobe, M. Omasa, H. Date  
*Thoracic Surgery, Kyoto University, Kyoto, Japan*

**Objectives:**

Despite significant advances in the treatment of cytomegalovirus (CMV) infection, it remains a major morbidity after lung transplantation. The purpose of this study was to examine risk factors of post-transplant CMV infection in our institution.

**Methods:**

We retrospectively analyzed 71 patients who underwent lung transplantation between April 2002 and January 2014. Recipients started CMV prophylaxis with intravenous ganciclovir (GCV). And they had following oral administration of ①GCV for postoperative 3 months (-2007), ②valGCV for 3 months in R+ and R-D- patients and 6 months in R-D+ (2008-2012), or ③for 12 months in R+ and R-D+ (2012-). Clinical factors such as source of donors (living versus brain dead), CMV serostatus, and duration of prophylaxis were investigated.

**Results:**

Living-donor lobar lung transplantation (LD) was performed in 38 patients and brain dead-donor lung transplantation (BD) in 33 patients. The mean duration of follow up was 32.5 months. Thirty-three recipients developed CMV antigenemia (46.5 %) and 7 developed CMV disease (9.9 %). There was no difference between LD and BD in the incidence of CMV infection. R-D+ patients tended to be more likely to develop CMV disease in comparison to R+ and R-D- patients. Seventeen patients (23.9 %) had an early cessation of prophylaxis due to side effects. The early cessation was an unfavorable prognostic factor in the development of both antigenemia ( $p=0.0014$ , Fig.1A) and disease ( $p=0.033$ , Fig.1B). None of the patients who received 12-month prophylaxis developed CMV disease to date. Multivariate analysis revealed the cessation of prophylaxis ( $p=0.038$ ) and the short duration of prophylaxis ( $p<0.001$ ) were unfavorable prognostic factors in antigenemia-free survival.

**Conclusion:**

Early cessation of CMV prophylaxis appears to be a significant risk factor of CMV infection after lung transplantation. Patients who had the early cessation should be carefully monitored.

**Disclosure:** No significant relationships.

## P-201

**EARLY DETECTION OF OBLITERATIVE BRONCHIOLITIS WITH AN AIR TRAPPING INDEX BASED ON SPECIFIC GAS VOLUME ANALYSIS OF CHEST COMPUTED TOMOGRAPHY**

Lorenzo Rosso<sup>1</sup>, C. Salito<sup>2</sup>, M. Nosotti<sup>1</sup>, A. Palleschi<sup>1</sup>, D. Tosi<sup>1</sup>, P. Mendogni<sup>1</sup>, I. Righi<sup>1</sup>, A. Aliverti<sup>2</sup>

<sup>1</sup>*Thoracic Surgery and Lung Transplantation, Fondazione Cà Granda Ospedale Maggiore Policlinico, Milan, Italy*

<sup>2</sup>*Dipartimento di Elettronica Informazione e Bioingegneria, Politecnico di Milano, Milan, Italy*

**Objectives:**

Because the obliterative bronchiolitis after lung transplantation is difficult to detect and quantify by transbronchial biopsy, air trapping on end-expiratory CT was proposed as an indirect sign of bronchiolitis. To overcome the interobserver disagreements and the gravity factor, the variation of specific gas volume (SVg) on CT was proposed. We analysed regional variations of SVg obtaining an Air Trapping index as indicator for obliterative bronchiolitis in recently transplanted patients.

**Methods:**

Clinically stable patients, who were scheduled for routine transbronchial biopsy six months after lung transplantation, underwent to a chest CT scan at residual volume (RV) in addition to standard scan at total lung capacity (TLC) before the biopsy and the bronchoalveolar lavage. Correspondent images were selected and processed to obtain two-dimensional maps of SVg at the aortic arch, the carina and top diaphragm levels. Air Trapping index was defined as  $\Delta SVg/SVg_{RV}$ , where  $\Delta SVg$  is equal to  $SVg_{TLC} - SVg_{RV}$ . Spirometric data were recorded for three months.

**Results:**

Eight patients completed the protocol. All transbronchial biopsies were designed as A1, B0, C0. Three patients had increased bronchoalveolar lavage neutrophilia. Such patients had a mean 1.3% FEV1/month improvement versus 3.5% in patients without neutrophilia. The whole population demonstrated some grade of air trapping (mean Air Trapping index =  $0.71 \pm 0.57$ ; normal value =  $2.87 \pm 0.94$ ). Patients with neutrophilia had mean Air Trapping index 0.90 versus 0.50 in patients without neutrophilia. Patient with neutrophilia had lower Air Trapping index variance (0.03 versus 0.15).

**Conclusion:**

This pilot study suggested that the Air Trapping index (obtained with a specific gas volume analysis on chest CT at total lung capacity and residual volume) is congruent with increased bronchoalveolar lavage neutrophilia and poor FEV1 improvement in recently lung transplanted patients. Air trapping index could be useful in early identification of patients at risk for obliterative bronchiolitis.

**Disclosure:** No significant relationships.



P-202

**VIDEO-ASSISTED THORACOSCOPIC AND ROBOTIC ASSISTED THORACOSCOPIC RESECTION OF MEDIASTINAL ECTOPIC PARATHYROID ADENOMA**

Kamran Ali<sup>1</sup>, S. Khandelwal<sup>1</sup>, N. Agarwal<sup>1</sup>, K. Amer<sup>2</sup>, A. Khan<sup>1</sup>

<sup>1</sup>*Minimally Invasive Thoracic Surgery, Medanta the Medicity, Gurgaon, India*

<sup>2</sup>*Thoracic Surgery, Southampton General Hospital, Southampton, United Kingdom*

**Objectives:**

Ectopic Mediastinal parathyroid adenomas are rare causes of hyperparathyroidism. Surgery offers potential cure, which conventionally involves a sternotomy. We share our experience of resection of mediastinal parathyroid adenomas by video assisted thoracoscopic surgery (VATS) and robotic assisted thoracoscopic surgery.

**Methods:**

A total of 13 patients of primary hyperparathyroidism, with a mean age group of 44.6 years, between June 2011 and September 2014, were diagnosed to have a mediastinal ectopic parathyroid adenoma on the basis of Sestamibi scan. Intravenous Methylene blue was used intraoperatively to highlight the adenoma within the mediastinal tissue. 10 patients underwent resection of adenoma by VATS and 3 by Robotics.

**Results:**

Intraoperative Parathormone (PTH) level fall >50% of preoperative level was considered successful resection of adenoma. One patient of Robotics required conversion to open due to haemorrhage from a feeding vessel from right subclavian artery. Mean post operative serum calcium level on POD1 was 9.5mg/dl and PTH level was 27.9 pg/ml. Chest drain was removed on POD 1 in 8 patients and on POD2 in 2 patients.

**Conclusion:**

Ectopic mediastinal parathyroid gland can be safely resected using VATS and robotics due to excellent intraoperative visualisation, minimal surgical morbidity, short hospital stay and good cosmetic results. Intraoperative use of intravenous methylene blue helps to accurately highlight the ectopic parathyroid tissue.

**Disclosure:** No significant relationships.

**P-203****FACTORS INFLUENCING LENGTH OF STAY AFTER SURGERY FOR BENIGN FOREGUT DISEASE**

Karen J Dickinson, J. Taswell, M.S. Allen, S.H. Blackmon, F.C. Nichols Iii, K.R. Shen, D.A. Wigle, S.D. Cassivi

*Division of General Thoracic Surgery, Mayo Clinic, Rochester, United States of America*

**Objectives:**

Length of stay (LOS) is an important measure of quality and healthcare costs. Variation occurs due to individual/institutional practices, patient/social factors and case complexity. Identification of variables affecting LOS may help develop enhanced recovery protocols (ERP). This study aims to identify factors influencing LOS following surgery for hiatal hernia, gastroesophageal reflux, and achalasia.

**Methods:**

We identified all patients who underwent benign foregut surgery between August 2013-July 2014. Data from a prospectively maintained database were collected and univariate/multivariate analysis performed. All patients were contacted to determine 30-day readmission rate to any hospital.



**Results:**

	Overall cohort	Laparoscopic Surgery (LS)	Open surgery (OS)	p-value (LS vs. OS, ns = not significant)
Number of patients	165	113	52	
Age in years (median)	66	65	70	ns
Male:female	62:103	45:68	17:35	ns
Primary surgery	150 (91%)	108 (96%)	42 (81%)	0.006
Revisional surgery	15 (9%)	5 (4%)	10 (19%)	0.006
Reoperation during admission	1 (<1%)	1 (1%)	0 (0%)	ns
30-day readmission	9 (5%)	3 (3%)	6 (12%)	0.003
Length of stay, days (median, range)	2 (1-17)	2 (1-17)	4 (2-14)	<0.0001
Factors affecting LOS	<ul style="list-style-type: none"> <li>• Surgical approach***</li> <li>• ASA**</li> <li>• Removal of NG in OR**</li> <li>• Discharge location**</li> </ul>	<ul style="list-style-type: none"> <li>• Patient age*</li> <li>• Operative time***</li> <li>• OR exit time (am v pm)*</li> <li>• Removal of NG in OR***</li> <li>• Postoperative nausea counts*</li> <li>• Discharge destination*</li> </ul>	<ul style="list-style-type: none"> <li>• Patient age***</li> <li>• ASA*</li> <li>• Urinary catheter on discharge**</li> <li>• Discharge destination**</li> <li>• Day of discharge*</li> </ul>	<p>*p&lt;0.05, **p&lt;0.01 ***p&lt;0.001</p>

165 patients were identified in the 12-month period. 68% underwent laparoscopic surgery (LS) and 32% open surgery (OS). The rate of laparoscopic conversion to open and operative mortality were zero. Statistically, the most significant predictor of LOS was surgical approach. Median LOS was 2 days for LS and 4 days for OS (p<0.0001). Beyond surgical approach, the following factors were significant in predicting LOS: for LS patients, younger age, shorter operative time, NG removal in the operating room (OR), leaving OR before noon, low postoperative nausea counts, and discharge to home rather than a skilled facility, were associated with reduced LOS. For OS patients, younger age, ASA 1-2, urinary catheter removal before discharge and discharge to home, or on the weekend were associated with reduced LOS. Whether surgery was primary or revisional did not affect LOS. Overall readmission rate was 5% (LS 3%, OS 12%; p=0.003).

**Conclusion:**

The utilisation of laparoscopic surgery, when feasible, in the treatment of benign foregut diseases is the strongest predictor of a decreased LOS. Modifiable factors influencing LOS include OR exit time, NG tube removal in the OR, urinary catheter removal in hospital and postoperative nausea control. Any implementation of ERP to optimise these factors must monitor readmission rates and complications to confirm efficacy.

**Disclosure:** No significant relationships.



P-204

**ROLE OF EXTRACORPOREAL LIFE SUPPORT AFTER PULMONARY ENDARTERECTOMY: A SINGLE CENTRE EXPERIENCE**

Laura Donahoe<sup>1</sup>, J. Granton<sup>2</sup>, K. Mcrae<sup>3</sup>, J. Thenganatt<sup>2</sup>, J. Moric<sup>2</sup>, S. Keshavjee<sup>1</sup>, M. De Perrot<sup>1</sup>

<sup>1</sup>*Division of General Thoracic Surgery, University of Toronto, Toronto, Canada*

<sup>2</sup>*Division of Respiriology, University of Toronto, Toronto, Canada*

<sup>3</sup>*Anesthesiology, Toronto General Hospital, Toronto, Canada*

**Objectives:**

Extracorporeal Life Support (ECLS) for rescue after pulmonary endarterectomy (PEA) has become a viable option. This study aims to present a single centre experience looking at the indications, risk factors and outcome of ECLS after PEA.

**Methods:**

Retrospective analysis of all patients undergoing PEA from 01/2008 to 12/2014 in our institution.

**Results:**

Among 144 consecutive patients undergoing PEA for chronic thromboembolic pulmonary hypertension, 6 (4%) received ECLS postoperatively for right ventricular (RV) failure (n=3), severe hypoxemia (n=2), and hemorrhagic pulmonary edema (n=1). ECLS configuration was central veno-arterial (cVA) in 3 patients, peripheral VA (pVA) in 1 and veno-venous (VV) in 2. One patient with cVA was switched to VV after 5 days. Overall ECLS duration ranged between 3 and 39 (median 5) days. ECLS patients had higher preoperative total pulmonary vascular resistance (TPR) compared to non-ECLS patients (1477±671 Dynes.s.cm-5 vs 954±462 Dynes.s.cm-5, p=0.009) and more frequently required hospital admission for RV failure before surgery (50% vs 9%, p=0.02). All patients requiring VA ECLS had a preoperative TPR>1200 Dynes.s.cm-5. Non-significant differences were found for pre-operative 6' walk distance (341±193 m vs 375±132 m, p=0.5) and brain natriuretic peptide (391±611 pg/ml vs 277±367 pg/ml, p=0.5). The overall in-hospital mortality rate for all patients was 2% (3/144), including the ECLS patient on pVA. The remaining 5 ECLS patients (83%) were discharged from hospital and are alive after a median follow-up of 7 (range 2-23) months. Two ECLS patients (40%) are on therapy for residual PH compared to 13 (10%) in the non-ECLS patients (p=0.09).

**Conclusion:**

ECLS is a safe and important rescue option after PEA. cVA configuration is theoretically favored in that it temporarily decreases the total flow through the damaged post-endarterectomy pulmonary vasculature. The use of ECLS may expand eligibility for PEA by allowing sicker patients to undergo surgery with good results.

**Disclosure:** No significant relationships.

**P-205****UTILITY OF 18F-FDG PET-CT IN PATIENTS WITH INVASIVE THYMIC EPITHELIAL TUMORS WHO UNDERWENT INDUCTION THERAPIES**

Koichi Fukumoto, T. Taniguchi, K. Kawaguchi, T. Fukui, F. Ishiguro, S. Nakamura, S. Mori, K. Yokoi

*Thoracic Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan*

**Objectives:**

Positron emission tomography using [18F]fluoro-2-deoxy-D glucose (FDG-PET) currently plays an important role in many oncological settings. In this study, we investigated the utility of <sup>18</sup>F-FDG PET-CT (PET-CT) for predicting the effect of induction therapy in patients with invasive thymic epithelial tumors.

**Methods:**

We retrospectively analyzed 13 patients with invasive thymic epithelial tumors who underwent PET-CT before and after induction therapy. Relationship between the change of maximum standardized uptake value (SUVmax) in PET-CT, response evaluation criteria in solid tumors (RECIST), and pathological response (Ef0: no necrosis of tumor cells, Ef1: more than two-thirds of tumor cells were viable, Ef2: less than one-third of tumor cells were viable, Ef3: no tumor cells were viable) were analyzed.

**Results:**

The patient characteristics are shown in Table. There were 5 male and 8 female, ranging in age from 25 to 71 years (median, 60 years). Tumor histology of 9 tumors was thymoma, and that of the remainder was thymic squamous cell carcinoma. The tumor Masaoka stages were stage II in 3 patients, stage III in 5 patients, and stage IV in 5 patients. Induction therapy included 9 chemotherapies, 3 chemoradiation therapies and 1 radiation therapy. In 8 patients with Ef0/1, 5 were classified to be stable disease (SD) and 3 to be partial response (PR) according to the RECIST. The changes of SUVmax were elevation in 2 patients, no change in 1 patient, and decrease in 5 patients (reduction rate: 10-37%). On the other hand, in 5 patients with Ef2, 3 were classified to be SD and 2 to be PR. The SUVmax have decreased in all patients (reduction rate: 3-87%).

**Conclusion:**

PET-CT seems to be a useful modality for predicting the pathological response of induction therapy in patients with invasive thymic epithelial tumors.

**Disclosure:** No significant relationships.



P-206

**ARE ALL LUNG NODULES IN PATIENTS WITH ESOPHAGEAL CANCER DUE TO METASTASES? A REVIEW FROM A REGIONAL THORACIC UNIT EXPERIENCE OVER 24 YEARS**

Mohammad Hawari, I. Mydin, K. Ang, J. Duffy

*Department of Thoracic Surgery, Nottingham City Hospital, Nottingham, United Kingdom*

**Objectives:**

With improvement in imaging modality, it is not uncommon to find patients with incidental lung nodules during oesophageal cancer staging. Whether these are metastases pose a diagnostic challenge as many nodules are not easily biopsied percutaneously and will need a surgical biopsy. We review the histology of patients with oesophageal cancer who had lung nodule biopsied surgically in our regional centre over the past 24 years.

**Methods:**

Retrospective review of a prospective database of all patients with oesophageal cancer who had surgical biopsies of their lung nodules in our department.

**Results:**

33 patients (26 males & 7 females, median age 71) were identified. 26 had oesophageal adenocarcinoma (ADC) and 7 had squamous cell carcinoma (SCC). 39.4% of patients had staging PET scans. 9/33 patients had neo-adjuvant chemotherapy (26.4%) before the lung biopsy. Lung biopsy was performed either by thoracoscopy or thoracotomy with concurrent frozen section analysis. 12 patients had malignant lesions and did not proceed to oesophagectomy. Only 4 were confirmed on paraffin section as oesophageal metastasis (12.1%), while rest were broncho-alveolar carcinoma (2), primary lung ADC(3), lung SCC(1), carcinoid(2); and breast metastasis(1). 21 patients had benign histology, of which 15 then proceeded to oesophagectomy in the same sitting. Unfortunately 5 of these patients were deemed inoperable due to peritoneal or liver spread found at attempted oesophagectomy.

**Conclusion:**

12.1% of lung nodules turned out to be due to oesophageal metastasis. Biopsy of the lung lesion is mandatory before denying surgery. This can be done at the same sitting as the planned oesophagectomy if frozen section is available to prove the lesion is benign; and the surgeon is familiar with performing oesophagectomy via left or right-side approach. In selected patients with a synchronous primary lung cancer, simultaneous resection of both tumours is feasible.

**Disclosure:** No significant relationships.

P-207

**SHOULD RADICAL SURGERY BE A PART OF MULTIMODALITY THERAPY FOR MASAOKA STAGE IVA THYMOMA?**

Berker Ozkan, A. Demir, E. Kaba, S. Erus, S. Duman, B. Cimenoglu, A. Toker  
*Thoracic Surgery Department, Istanbul University, Istanbul Medical Faculty, Istanbul, Turkey*

**Objectives:**

The aim of this study is to analyze the results of multimodality therapy in Masaoka stage IVA thymoma patients.

**Methods:**

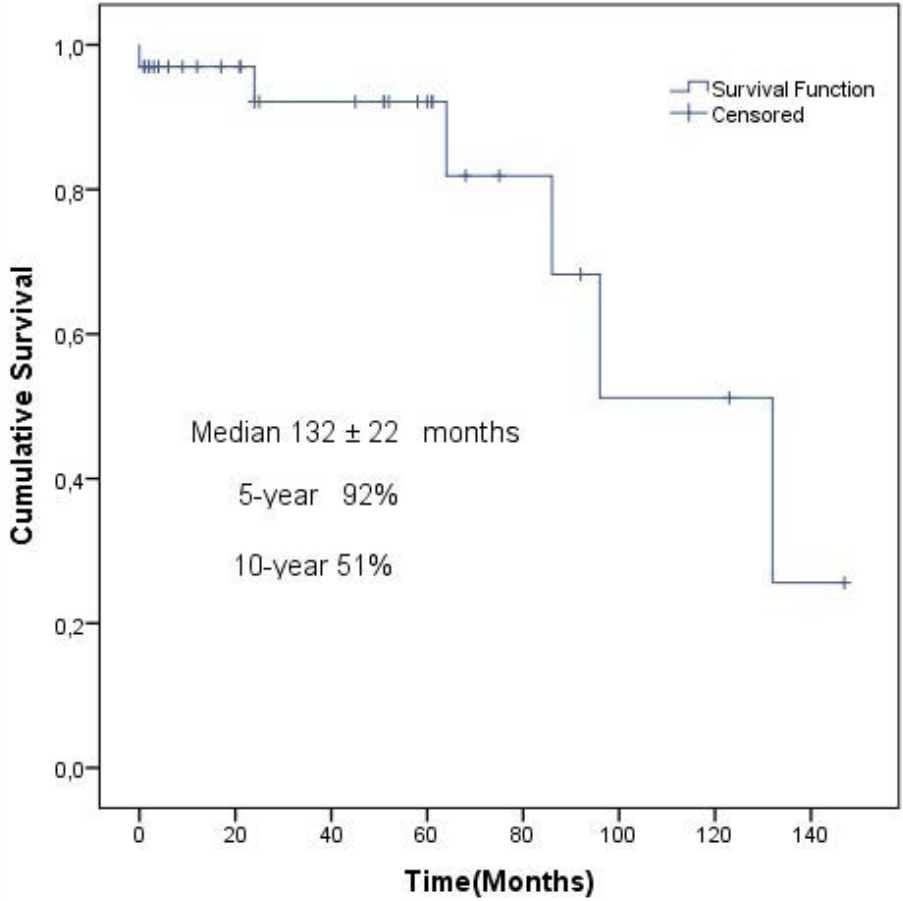
Between January 2002 and December 2014, 173 operations for thymoma were performed. Thirty-three (19%) of them were at Masaoka stage IVa. Three patients had pleuropneumonec-tomy, 15 patients had radical pleurectomy/decortication and 15 patients had local excision of the pleural/pericardial implant. The mean age was 42±12 (18-70) years and 18 (55%) patients were male. The prospectively collected data was analyzed.

**Results:**

Thymoma B2 was the most common (n:12, 41.4%) histopathological type. Seventeen (52%) patients had myasthenia gravis. Twenty-two of the patients had primary operation whereas, 7 of them had secondary, 4 of them tertiary operations for recurrences. The morbidity and mortality rates were 33% and 3%. Mean hospital stay was 12±1 (4-61) days. Twenty (61%) patients had a neoadjuvant treatment prior to operation. The median survival time was 132±22 months. The overall 5-year, and 10-year survival rate was 92% and 51% respectively.

**Conclusion:**

Multimodality therapy including radical surgery for thymoma with pleural or pericardial im-plants could be accepted as a safe operation. Surgery may help in providing long term survival at Masaoka stage IVa.



**Disclosure:** No significant relationships.

**P-208****HAND SEWN VERSUS STAPLED ESOPHAGO GASTRIC ANASTOMOSIS - DOES THE TYPE OF ANASTOMOSIS INFLUENCE QUALITY OF LIFE IN LONG TERM SURVIVORS?**Vishwas D. Pai, S. Jiwnani, G. Karimundackal, C.S. Pramesh*Thoracic Surgery and Surgical Oncology, Tata Memorial Centre, Mumbai, India***Objectives:**

With improvement in overall survival, health related quality of life [HRQOL] has become an important objective while planning treatment for esophageal carcinoma. One of the most important controversies in the surgical management of esophageal cancer has been the type of esophago gastric anastomosis i.e, hand sewn versus stapled. Since clinical outcomes have been comparable between the two groups, we aimed to determine if there is a difference in terms of HRQOL. Our primary hypothesis was that stapled anastomosis leads to lower dysphagia scores in the medium term.

**Methods:**

This is a retrospective review of a prospectively maintained database. Patients who underwent potentially curative, transthoracic /transhiatal esophagectomy with cervical esophagogastric anastomosis between 2005 and 2012 and who were alive and on regular follow up for at least 2 years were included. EORTC QLQ C30 and EORTC OES 18 questionnaires were administered to all the patients preoperatively as well as at 2 years after the index surgery. Scales computed for each domain score were presented as mean (S.D). Mann-Whitney U test was used to compare scores of the two groups.

**Results:**

Three hundred fifty two patients were included. Thirty three patients (10%) had undergone transhiatal esophagectomy whereas rest had undergone transthoracic esophagectomy. Minimally invasive surgery was performed in 128 patients (36%) whereas open surgery was performed in 224 patients (64%). Fifty eight patients (16%) had undergone hand sewn anastomosis whereas the rest had undergone stapled anastomosis using linear staplers. At 2 years after the surgery, the function scores were comparable between the two groups. Mean dysphagia scores were 69.53 with stapled and 63.79 with hand sewn anastomosis (p value – 0.211). There was no significant difference between the groups in terms of other symptom scores.

**Conclusion:**

Type of esophago gastric anastomosis does not influence HRQOL at 2 years after the surgery.

**Disclosure:** No significant relationships.





P-209

**MODIFIED METHOD TO CREATE GASTRIC TUBE IN TOTAL MINIMALLY INVASIVE ESOPHAGECTOMY FOR ESOPHAGEAL CANCER**Dazhi Pang, J. Li, Q. Luo, F. Chan*Department of Surgery, The University of Hong Kong Shenzhen Hospital, Shenzhen, China***Objectives:**

To introduce technical details and preliminary results of modified method of creation of gastric tube in thoracoscopic and laparoscopic esophagectomy.

**Methods:**

We retrospectively studied 42 patients with three-phase esophagectomy for thoracic esophageal squamous cell carcinoma from January 2012 to September 2014. The patients were assigned into two groups according to the different operation methods. 21 Patients in Group A underwent Luketich's method for creation of gastric tube with complete transection of gastric fundus. Alternatively, 21 patients in group B, the fundus was not completely divided leaving 3cm of fundus intact. The esophagus, resection part of stomach and gastric conduit were then retrieved to neck incision sequentially. Four and five 5-10mm skin incisions were made over right chest and abdomen, respectively. A 5cm skin incision was made in the left neck for specimen retrieval and esophagogastric anastomosis by circular stapler.

**Results:**

All operations were performed successfully with no intraoperative complication. There was no perioperative mortality. Postoperative complications developed in 7 patients (16.7%), including anastomotic leakage (1 patient, 2.38%), gastric volvulus (1 patient, 2.38%), pulmonary atelectasis (3 patients, 4.76%), and neck wound infection (2 patients, 4.76%). The operation time was significantly longer in the group A than in the group B ( $263\pm 39.2\text{min}$  VS  $210\pm 30.3\text{min}$ ,  $P=0.032$ ). The complication rate was significantly higher in group A than in group B (28.6% VS 4.8%,  $P=0.038$ ). There was no difference in blood loss, ICU stay and hospital stay.

**Conclusion:**

Modified method for creation of gastric tube is feasible in total minimally invasive esophagectomy. It may be associated with shorter operation time and lower postoperative complication rate.

**Disclosure:** No significant relationships.

**P-210****FEASIBILITY OF THE CLAVIEN-DINDO CLASSIFICATION SYSTEM AFTER RADICAL ESOPHAGECTOMY**

C S Pramesh, S. Jiwnani, G. Karimundackal

*Thoracic Surgery and Surgical Oncology, Tata Memorial Centre, Mumbai, India***Objectives:**

Esophageal resections are associated with considerable morbidity and mortality. Complication rates vary widely with the variability primarily being due to differences in definitions and grading of postoperative complications. The Clavien-Dindo (CD) system of classifying postoperative complications is widely used in several specialties of surgery but large studies are lacking after radical esophagectomy. We wanted to evaluate the feasibility of being able to classify all complications after esophagectomy into one of the CD grades.

**Methods:**

We performed a prospective study between June 2011 and Dec 2014 to confirm the feasibility of documenting post esophagectomy complications using the Clavien-Dindo system. A single observer documented and classified all in-hospital postoperative complications according to the CD system. Grading was done for individual types of complications (pulmonary, anastomotic etc) with the highest complication grade considered as the aggregate complication grade for an individual patient. Complications with grade 3a and above were considered as major complications. Complications were expressed in the different grades as percentages of the total patients undergoing surgery for esophageal cancer.

**Results:**

A total of 515 patients operated for esophageal cancer between June 2011 and Dec 2014 were included in the study. The CD grading of postoperative complications were as follows: Grade 0, 225 (43.7%), Grade 1, 78 (15.1%), Grade 2, 21 (4.1%), Grade 3a, 107 (20.8%), Grade 3b, 30 (5.8%), Grade 4a, 21 (4.1%), Grade 4b, 1 (0.2%) and Grade 5, 32 (6.2%). 37.1% of patients had major complications. None of the complications were unclassifiable into the CD grades.

**Conclusion:**

The Clavien-Dindo system is feasible and offers an objective method of classifying complications after radical esophagectomy. Standardized nomenclature or systems of classifying postoperative complications may enable comparisons across centres and studies.

**Disclosure:** No significant relationships.



P-211

**OUTCOMES OF PATIENTS WITH SEVERELY IMPAIRED PREOPERATIVE PULMONARY FUNCTION WHO RECEIVED TRANSTHORACIC ESOPHAGECTOMY FOR ESOPHAGEAL CARCINOMA**Junjie Xi, W. Jiang, H. Wang*Department of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China***Objectives:**

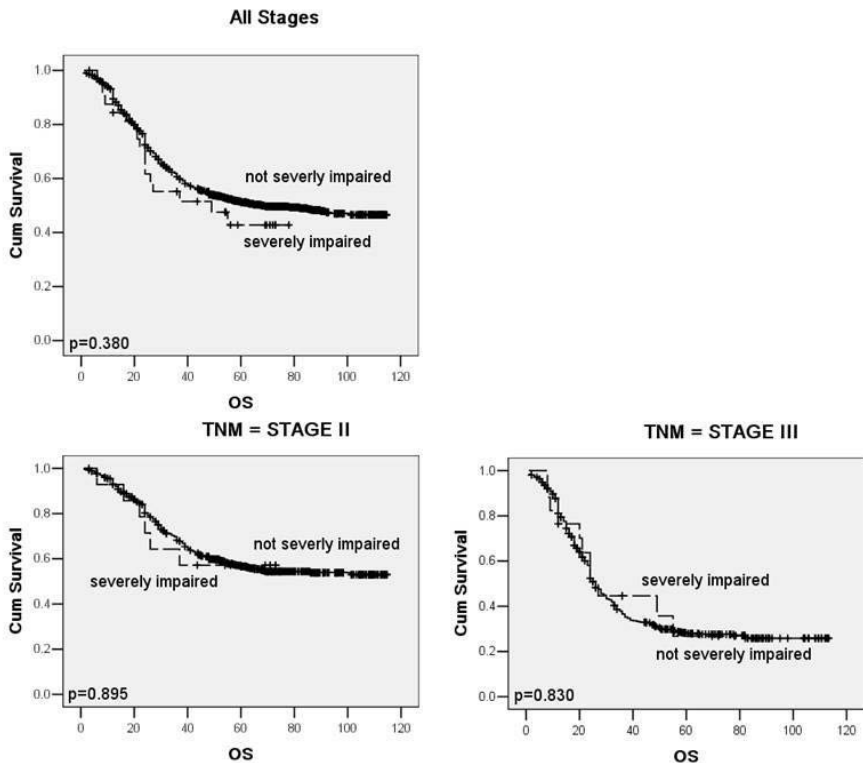
Severely impaired preoperative pulmonary function is assumed to be a risk factor of pulmonary complications for patients who receive transthoracic esophagectomy. However, few study has reported short-term and long-term outcomes of these patients. This study aims to investigate short-term and long-term outcomes of esophageal carcinoma patients with severely impaired preoperative pulmonary function who received transthoracic esophagectomy.

**Methods:**

From 2005 to 2010, 1487 patients received transthoracic esophagectomy for esophageal carcinoma in our department. Preoperative pulmonary function test was evaluated in every patient. Forced expiratory volume in one second < 50% predicted were defined as severely impaired pulmonary function. Thirty-five of them had severely impaired pulmonary function.

**Results:**

Of the 35 patients with impaired pulmonary function, twenty-four patients underwent Sweet esophagectomy; six patients underwent Ivor-Lewis esophagectomy; two patients underwent Mckeown esophagectomy; three patients received minimally invasive esophagectomy. Significant pulmonary complications occurred in 3 patients. Two patients died in hospital. One died of pulmonary infection, and the other died of myocardial infarction. Perioperative death rate were comparable for patients with and without severely impaired pulmonary function (5.7% versus 2.0%,  $p=0.128$ ). Patients with severely impaired pulmonary function were more likely to develop significant pulmonary complications (8.6% versus 2.3%,  $p=0.017$ ). The 5-year survival rate of these patients was 42.8%, which was not significantly worse with that of patients without impaired pulmonary function (51.5%,  $p=0.38$ ). In TNM subgroup analysis, 5-year survival rates of patients with and without severely impaired pulmonary function are also comparable.

**Conclusion:**

Patients with severely impaired pulmonary function take higher risk for significant pulmonary complications after transthoracic esophagectomy, but long-term outcomes are comparable for patients with and without severely impaired pulmonary function.

**Disclosure:** No significant relationships.



P-212

**A COMPARISON OF INDICES FOR LUNG COLLAPSE MEASUREMENT USING AS GOLD STANDARD A MODEL CREATED BY 3D TECHNOLOGY**

Borja Aguinagalde, J. Zabaleta, J.M. Izquierdo, M. Mendoza, E. Garmendia, I. Lopez, S. Laguna, J.I. Emparanza

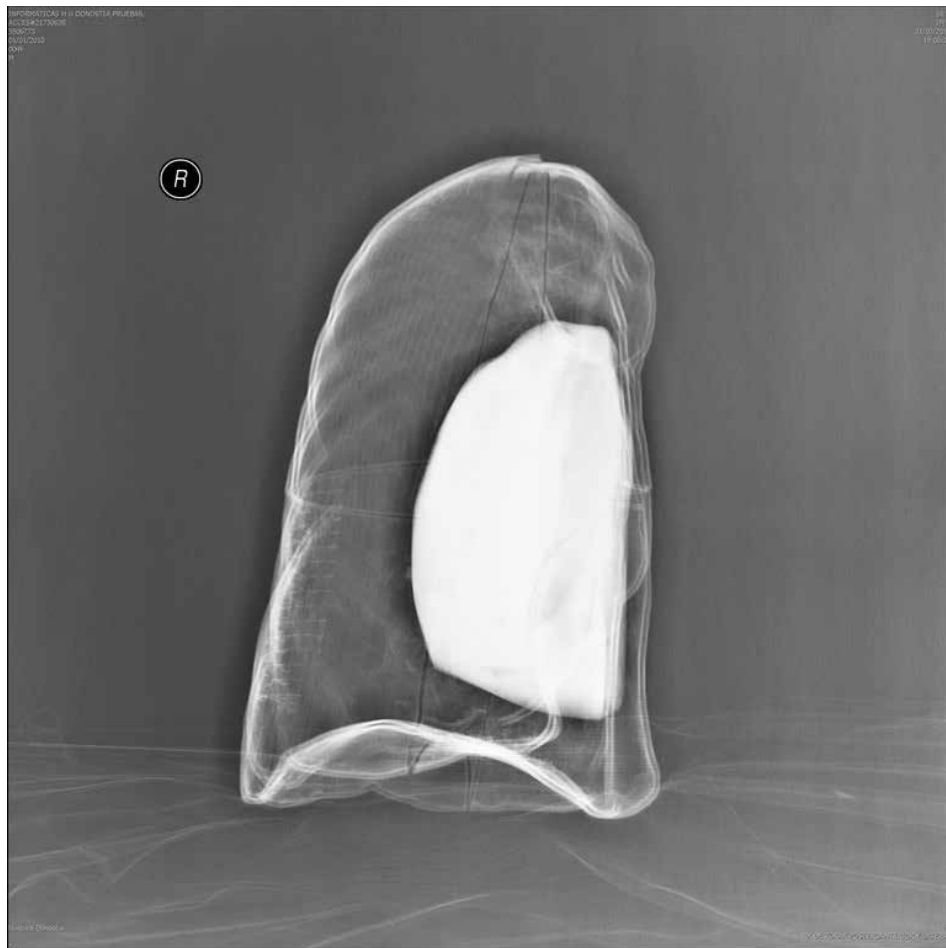
*Thoracic Surgery, Donostia University Hospital, Donostia, Spain*

**Objectives:**

The aim of this study was to define the relationship between different indices to measure lung collapse in pneumothorax, and to create a more accurate index based on 3D technology.

**Methods:**

A 3D hemithorax was created based on the data of measured volume of real patient CTs. Different collapsed lungs were created with plasticine using the formula (Volume= weight/density) to calculate the volume. The density of the plasticine was 1,18g/ml. 52 x-rays were done, and the real collapse of each pneumothorax was calculated. 3 researchers (2 radiologists and 1 thoracic surgeon) reviewed and measured interpleural spaces, Collins and Light indices. Intraobserver was measured using intraclass correlation coefficient (ICC), concordance correlation coefficient (CCC) and Bland-Altman plot and interobserver agreement was measured using ICC. Collins and Light concordance was described using CCC and both were compared with our 3D gold standard using regression analysis. (STATA 13). Based on our data, a new formula was created (working in validation).

**Results:**

52 x-ray were reviewed by three researchers, 17 of them were repeated. Intraobserver and interobserver agreement was very close (summarized in table1). The concordance correlation coefficient of Lin between Light and Collins was moderate 0.80 (0.76-0.84). The r squared for the regression model Collins-3DGold-Standard was poorer (0.92) than the r squared for the regression model Light-3DGold-Standard (0.96). We identified that Collins overestimates the size of the pneumothorax in our 3D models, noting in some cases values above 100% and that Light does not identify apical pneumothoraces. We derived a new index aiming at solving these weaknesses and we are in the process of validation.

Table 1

	Light		Collins	
Intraobserver	ICC (conf. interval95%)	CCC (conf. interval95%)	ICC (conf. interval95%)	CCC (conf. interval95%)
Researcher1	0.99 (0.98-0.99)	0.99 (0.98-0.99)	0.92 (0.8-0.97)	0.90 (0.81-0.94)
Researcher2	0.99 (0.96-0.99)	0.99 (0.96-0.99)	0.99 (0.99-0.99)	0.99 (0.99-0.99)
Researcher3	0.99 (0.99-0.99)	0.99 (0.99-0.99)	0.98 (0.95-0.99)	0.98 (0.95-0.99)
Interobserver	ICC			
Light	0.99(0.98-0.99)			
Collins	0.93(0.84-0.97)			

**Conclusion:**

3D technology enables the creation of a gold-standard for measuring pneumothorax. Collins index shows an overestimation compared to Light and Gold standard, while the index of Light does not identify apical pneumothoraces. A More accurate index is needed for measuring pneumothorax.

**Disclosure:** No significant relationships.

P-213

**VATS VERSUS AXILLARY MINITHORACOTOMY IN THE MANAGEMENT OF THE SECOND EPISODE OF PRIMARY SPONTANEOUS PNEUMOTHORAX**Duilio Divisi, G. Di Leonardo, R. Crisci*Thoracic Surgery, University of L'Aquila, "G. Mazzini" Hospital, Teramo, Italy***Objectives:**

The cost-effectiveness analysis in the surgical treatment of recurrence of primary spontaneous pneumothorax (PSP) was carried out, comparing the video-assisted thoracic surgery (VATS) with muscle-sparing axillary minithoracotomy (MSAM).

**Methods:**

Between July 2006 and October 2012 we treated 56 patients with a second episode of PSP by VATS or open approach. Time of intervention, prolonged air leaks, duration of pleural drainage, length of hospitalization and long term morbidity were evaluated, establishing the relationship between costs and quality-adjusted life (QAL) for each technique.

**Results:**

VATS allowed a statistically significant improvement ( $p = 0.00001$ ) in the duration of pleural drainage and mean hospital stay. The minimally invasive method was less expensive than axillary minithoracotomy (2,443.44 € vs 3,170.80 €). The quality-adjusted life expectancy (QALE) of VATS was better than that of MSAM (57.00 versus 49.2 at 60 months) as well as the quality-adjusted life year (QALY, 0.03 at 1<sup>st</sup> year and 0.13 at 5<sup>th</sup> year). Incremental cost per life year gained (ICER) of VATS versus MSAM was between 24,245.33 € (1<sup>st</sup> year) and 5,776.31 € (5<sup>th</sup> year), making it advantageous at 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> years.

**Conclusion:**

VATS compared to MSAM in the treatment of a second episode of PSP ensured undoubted clinical advantages associated with a significant cost savings.

**Disclosure:** No significant relationships.



P-214

**THORACIC OUTLET SYNDROME IN PEDIATRIC PATIENTS: EVALUATION AND MANAGEMENT**Dean Donahue<sup>1</sup>, R. Gupta<sup>2</sup>, M. Torriani<sup>2</sup><sup>1</sup>*Thoracic Surgery, Massachusetts General Hospital, Boston, United States of America*<sup>2</sup>*Radiology, Massachusetts General Hospital, Boston, United States of America***Objectives:**

With few reports on thoracic outlet syndrome (TOS) in pediatric patients, the condition is often initially unrecognized. This paper assesses the presentation and treatment response for TOS in children.

**Methods:**

Clinical presentation and treatment results for all patients referred to a single institution for TOS evaluation between July 2007 and June 2014 were prospectively recorded and retrospectively analyzed. Pain symptoms were recorded on a visual analogue scale (VAS).

**Results:**

Of 844 patients evaluated for TOS, 49 were age 18 or younger (range 10-18 years). 14 presented with subclavian vein thrombosis (VTOS) and underwent supraclavicular 1<sup>st</sup> rib resection with venolysis, with 1 patient requiring bilateral surgery and 1 undergoing reoperation following prior rib resection elsewhere. All first-time surgical cases had complete resolution of their symptoms and no recurrences (mean follow-up 21.1 months, range 6-84 months). The patient undergoing reoperation required balloon venoplasty for persistent subclavian vein stenosis. The remaining 35 patients presented with neurogenic TOS (NTOS) symptoms of pain and altered sensation. A TOS-specific protocol CT scan was used to evaluate 85.7% (30/35), with abnormal findings in the thoracic outlet present in 80% (24/30). NTOS patients were initially managed non-operatively, with 54% (19/35) also receiving ultrasound-guided botulinum toxin A injections into the scalene and pectoralis minor muscles. 17 patients had 21 supraclavicular cervical and/or 1<sup>st</sup> rib resection with neurolysis (4 bilateral, 3 reoperations following prior surgery elsewhere) with 100% having a greater than 50% reduction in VAS pain score (mean follow-up 17.1 months, range 3-38 months). The overall morbidity rate was 2.8% (1/36) with no mortality.

**Conclusion:**

TOS should be considered in children presenting with symptoms of pain and/or swelling of the neck and upper extremity. Surgery was performed in 63.2% (31/49) with a positive treatment response in 100%. Non-surgical NTOS cases were managed with physical therapy and selected use of botulinum toxin A injections.

**Disclosure:** No significant relationships.

## P-215

**NUCLEIC ACID-BASED ASSAYS INCREASE PATHOGEN DETECTION OF PLEURAL EMPYEMA**

Katarzyna Furrer<sup>1</sup>, D. Goldenberger<sup>2</sup>, R. Frei<sup>2</sup>, M.N. Wiese<sup>1</sup>, M. Weisser<sup>3</sup>, M. Toffel<sup>1</sup>, D. Lardinois<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, University Hospital Basel, Basel, Switzerland*

<sup>2</sup>*Division of Clinical Microbiology, University Hospital Basel, Basel, Switzerland*

<sup>3</sup>*Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel, Basel, Switzerland*

**Objectives:**

Empyema is a common disease associated with high morbidity and mortality especially in immunocompromised patients. Conventional culture methods show a negative result in up to 70%. Molecular technique by broad-range bacterial PCR (Polymerase Chain Reaction) amplification of part of 16S ribosomal RNA (rRNA) gene followed by sequencing is able to detect all bacterial species in a single assay. Therefore we set up a study to investigate the value of the broad-range bacterial PCR for early pathogen detection and introduction of targeted antibiotic therapy of empyema in adults.

**Methods:**

From 01/2013 to 12/2014, 50 patients (34 men, 16 women) with mean age of 60 (26-89) who underwent surgery with thoracic empyema, were included in this prospective cohort study. Pleural fluid and pleural biopsies were harvested during the surgery. Conventional culture was compared with broad-range 16S PCR, Streptococcus pneumoniae PCR, and Streptococcus pneumoniae antigen test.

**Results:**

N=37 video-assisted thoracoscopic surgery (VATS) and N=13 primary open lung decortication were performed. From 37 VATS, N=19 were converted to thoracotomy. Results of broad-range PCR compared to culture are shown in Table 1. Identical PCR results were found in pleural fluid and corresponding biopsies in 95%. PCR detected twice as many pathogens compared to conventional culture. The ongoing antibiotic therapy was changed in 65% of patients with positive PCR results to specifically target the detected pathogens. Organisms identified by PCR were predominantly Fusobacterium nucleatum (N=9), Streptococcus pneumoniae (N=8). S. pneumoniae antigen test was positive in 5/8 patients with positive pneumococcal PCR. Table 1. Comparison of broad-range PCR with culture.

	PCR-positive	PCR-negative	Total
Culture-positive	15 (30%)	0 (0%)	15
Culture-negative	15 (30%)	20 (40%)	35
Total	30	20	50



**Conclusion:**

These results prove that broad-range PCR increases significantly the pathogen detection and facilitate the implementation of targeted antibiotic therapy. We believe that early diagnosis of pleural empyema using this technique will reduce the number of patients with advanced stage of this disease who requires open surgery.

**Disclosure:** No significant relationships.

**P-216****CHEST TUBE REMOVAL AFTER PULMONARY LOBECTOMY:  
END-INSPIRATION OR END-EXPIRATION?**

*Hironori Ishibashi, S. Baba, Y. Nakashima, C. Takasaki, M. Kobayashi, K. Okubo  
Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan*

**Objectives:**

During chest tube removal, inadvertent airflow into the chest cavity can occur. The cause of pneumothorax following removal of the chest tube can be unclear and may be attributed to either recurrent air leakage or a bronchopleural fistula, especially in cases of post-operative air leakage. No previous studies have directly addressed the question of whether it is optimal to remove the chest tube at the end of either inspiration or expiration. The aim of this study was to determine which method is associated with a lower risk of pneumothorax as a result of inadvertent airflow during chest tube removal after pulmonary lobectomy.

**Methods:**

We conducted a retrospective study of 400 consecutive patients who had undergone lobectomy at our institute between January 2011 and December 2014. Patients were assigned to 2 groups dependent on the method of chest tube removal as follows: 200 patients to the inspiration group and 200 patients to the expiration group. At the end of the surgical procedure, a 24-Fr chest tube was placed mid-chest up to the apex and was removed when no further air leaks were detected. The chest radiograph was examined within 24 hours after chest tube removal. The following variables were considered in the analysis: age, sex, body mass index, respiratory functions (FEV1.0%, %VC), presence of lung disease, smoking index, type of lobectomy, duration of chest tube placement, and pulmonary postoperative complications.

**Results:**

No significant difference was observed between the 2 groups with regards to these variables, with the exception of pneumothorax occurrence following chest tube removal. Pneumothorax occurred in 25 patients (6.2%); of which 20 patients (10%) were in the inspiration group and 5 patients (2.5%) were in the expiration group ( $p=0.0019$ ).

**Conclusion:**

The chest tube should be removed at the end of expiration following pulmonary lobectomy.

**Disclosure:** No significant relationships.



P-217

**DOES MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM RESTRICT EARLY POSTOPERATIVE LUNG FUNCTION?**Francesco Londero<sup>1</sup>, P. Froeschle<sup>1</sup>, R. Cimarosti<sup>2</sup><sup>1</sup>*Thoracic Surgery, Royal Devon and Exeter Foundation Trust, Exeter, United Kingdom*<sup>2</sup>*Epidemiology, Azienda ospedaliero-universitaria di Udine, Udine, Italy***Objectives:**

To determine the effect of Minimally Invasive Repair of Pectus Excavatum (MIRPE) on early postoperative lung function.

**Methods:**

The retrospective analysis includes 26 patients who underwent MIRPE following the Pilegaard modification of the original NUSS procedure between 2005 and 2013. Spirometry (FEV1, FVC) was performed pre-operatively and two, six and twelve weeks after surgery. Patients were furthermore asked to score their pain levels at these intervals.

**Results:**

Twenty-six patients were involved in the study, 22 male and four female. Median age was 17 years. The mean preoperative Haller index was 4.3. Fifteen patients had one stainless steel bar inserted, 11 patients required two bars. Median length of inpatient stay was six days. Mean preoperative FEV1 and FVC were 92.2% and 94.5% of predicted, at two weeks they were measured as 75.8% ( $p < 0.0001$ ) and 76.1% ( $p < 0.0001$ , 20 patients), at six weeks 78.9% ( $p = 0.0134$ ) and 78.21% ( $p = 0.013$ , 15 patients) and at twelve weeks 89.8% ( $p = 0.1311$ ) and 90.2% ( $p = 0.088$ , 23 patients). We found no correlation between severity of Pectus Excavatum -graded through the Haller index- and degree of impairment of preoperative FEV1 ( $p = 0.4237$ ) and FVC ( $p = 0.7617$ ). Interestingly the significant changes in FEV1 ( $p = 0.9883$ ) and FVC ( $p = 0.7398$ ) two weeks after MIRPE were unrelated to patient's postoperative pain scores. Age did not correlate with the degree of change in post-operative lung function (FEV1  $p = 0.1843$ , FVC  $p = 0.7718$ ).

**Conclusion:**

Our study reveals a significantly impaired lung function (FEV1, FVC) two and six weeks after MIRPE, with an almost complete recovery to preoperative levels after three months. This result confirms that a potential restrictive impact of the NUSS procedure on chest wall dynamics is only short-term and temporary. Age, severity of Pectus Excavatum and subjective pain scores could not be identified as factors predicting the degree of change in lung function after MIRPE.

**Disclosure:** No significant relationships.

P-218

**ELASTANCE OF THE PLEURAL SPACE COMPARED TO CLINICAL JUDGEMENT AS A PREDICTOR OF PLEURODESIS OUTCOME IN PATIENTS WITH MALIGNANT PLEURAL EFFUSION**

Carlos Martinez-Barenys<sup>1</sup>, E. Cladellas<sup>1</sup>, S. Garcia Reina<sup>1</sup>, P. Serra<sup>2</sup>, F. Andreo<sup>2</sup>, P.E. Lopez De Castro<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University Hospital Germans Trias i Pujol, Badalona, Spain*

<sup>2</sup>*Pneumology, University Hospital Germans Trias i Pujol, Badalona, Spain*

**Objectives:**

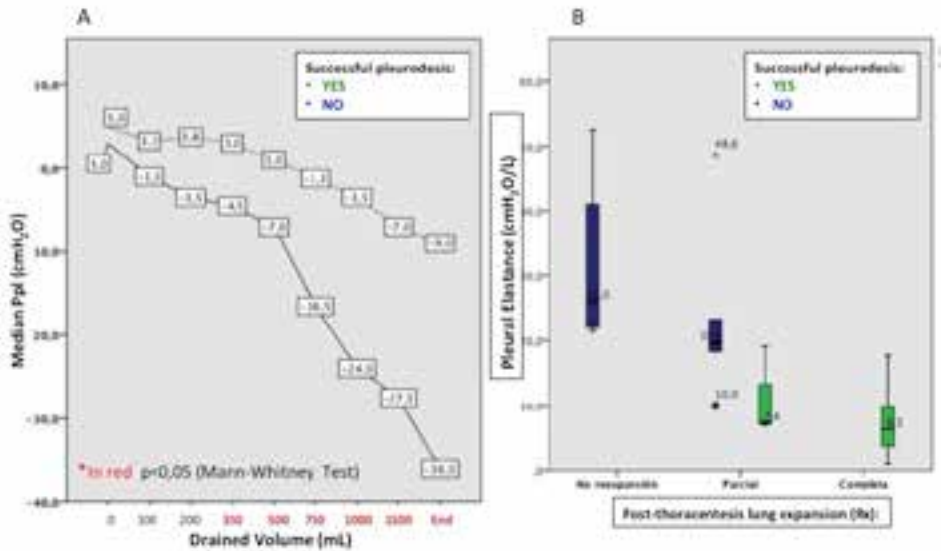
Talc slurry pleurodesis technique is only achieved if both pleural surfaces are juxtaposed at the time inflammation is induced. The main objective of this study is to determine if pleural elastance determination increases our ability to predict lung expansion and posterior successful pleurodesis (SP).

**Methods:**

20 patients with symptomatic malignant pleural effusion were included. After clinical evaluation, the surgeon's lung expansion and pleurodesis success prediction was recorded. Subsequently a thoracentesis with intrapleural pressure (Ppl) measurement is performed and pleural elastance (pEL) is calculated. Using this data patients are allocated to receive 10Fr pleural drainage and posterior talc slurry pleurodesis or to be treated with an indwelling catheter drainage system. Results were evaluated in short (hospitalization) and long (30 days) term. Owing to small sample size and nonnormal distributions within the data, nonparametric tests with a two-tailed alpha level=0,05 were used for comparison.

**Results:**

SP occurred in 50% of the cases. pEL=17,53 (SD=13,7), basal Ppl=4,87 (SD=4,86) and final Ppl=-17,37 (SD=12,2). Evacuated volume was 1428ml (SD=663). The median pEL (SP group)=7,12 [IQR:8,7] and medial pEL (non-SP group)=21,94 [IQR:15,3] (U-Mann-Whitney<0,001) Figure 1 shows Ppl evolution according to radiological lung expansion (A) and (B) is a box plot resuming pEL values according to lung expansion and pleurodesis success. pEL determination changed prediction pleurodesis result in 8 patients (40%). Pre-pEL prediction sensibility was:0,6 /specificity=0,5 /PPV=0,54/NPV=0,5 and after pEL raised to:0,8/0,9/ 0,88 and 0,81 respectively with a pre-pEL Kappa coefficient of 0,1 that rises up to 0,7 after pEL determination.



**Conclusion:**

Pleural elastance determination is able to identify patients with entrapped lungs and predicts pleurodesis outcome avoiding futile pleurodesis attempts or indwelling catheter placement in those suitable for pleurodesis.

**Disclosure:** No significant relationships.

P-219

**A NOVEL SURGICAL APPROACH FOR DIAPHRAGMATIC PLASTY USING BIOLOGICAL PATCHES IN PATIENTS WITH IDIOPATHIC DIAPHRAGM PALSY**Bassam Redwan<sup>1</sup>, S. Rehers<sup>2</sup>, S. Freermann<sup>1</sup>, J. Reichelt<sup>1</sup>, M. Semik<sup>1</sup>, S. Fischer<sup>1</sup><sup>1</sup>*Thoracic Surgery and Lung Support, Klinikum Ibbenbueren, Ibbenbueren, Germany*<sup>2</sup>*Anesthesiology and Intensive Care Medicine, Klinikum Ibbenbueren, Ibbenbueren, Germany***Objectives:**

Diaphragm plication improves pulmonary function in patients with idiopathic diaphragm palsy. Here, we report a novel surgical approach for diaphragmatic plasty using a biological patch.

**Methods:**

Between 01/2011 and 10/2014 all patients undergoing diaphragmatic plasty were analyzed retrospectively.

**Results:**

A total of 16 patients (8 females; mean age 60y) were included in the analysis. 15 patients presented with idiopathic diaphragm palsy, one patient developed diaphragm palsy following thymoma resection involving the phrenic nerve. In 14 patients, diaphragm palsy was unilateral (n=6 left-sided) and in 2 patients bilateral palsy was present. Diaphragm palsy led to consecutive lower lobe atelectasis resulting in an impairment of pulmonary function in all patients. Mean preoperative FEV-1, FVC and TLC were 59.7, 62.3 and 74.5 %, respectively. Severe dyspnea on exercise was the main symptom in all patients. 6 patients experienced recurrent atelectasis-associated infections. Diaphragmatic plasty was performed via lateral mini-thoracotomy. Intraoperatively, a PeriGuard® patch (Lamed, Germany) was attached to the native diaphragm using non-absorbable simple interrupted sutures in overlay technique. Subsequently, the patch with the underlying diaphragm was pulled down and fixed around the basal ribs using non-absorbable simple interrupted sutures. Upon re-ventilation, complete lung expansion was observed in all cases. Mean operating time was 42 minutes. Postoperative complications included a thoracic wall hematoma (n=1), which was treated conservatively, and a complete lower lobe atelectasis requiring bronchoscopy (n=1). Mean hospital stay was 7 days. At follow up (mean 16 months), lung function testing revealed a significant improvement of FEV-1, FVC and TLC (76.4, 79.4 and 90.4 % respectively) (p<0.05). So far, no relapses were observed.

**Conclusion:**

This novel surgical approach for diaphragmatic plasty represents a safe and effective alternative to the widely used diaphragm plication and results in a significant improvement of the pulmonary function. Currently, a thoracoscopic approach is under development.

**Disclosure:** No significant relationships.



P-220

## VIDEO-ASSISTED MINIMALLY INVASIVE RIB OSTEOSYNTHESIS USING INTRAMEDULLARY TITANIUM SPLINTS IN PATIENTS WITH UNSTABLE RIB FRACTURES: TREATMENT ALGORITHM AND FIRST CLINICAL RESULTS

Bassam Redwan, J. Reichelt, S. Freermann, M. Semik, S. Fischer

*Thoracic Surgery and Lung Support, Klinikum Ibbenbueren, Ibbenbueren, Germany*

### Objectives:

In patients with unstable rib fractures, surgical rib osteosynthesis has been increasingly reported. In comparison to the classical conservative therapy approach, surgical intervention reduced mortality and incidence of pneumonia. Untreated, rib fractures cause chronic pain due to pseudarthrosis formation. Rib osteosynthesis is often performed via lateral thoracotomy. Here we describe a therapy algorithm for video-assisted minimally invasive rib osteosynthesis (VATS-Rib) and our first clinical results.

### Methods:

Between 04/14 and 01/15, all patients undergoing VATS-Rib were analyzed retrospectively. All patients received a computed tomography of the chest with 3-D-reconstruction of the chest wall. For pain assessment, visual analogue scale (VAS) was implemented.

### Results:

21 patients (3 females, mean age 56 years) underwent VATS-Rib. Traumatic serial fracture of 4 ribs (mean) with unstable chest wall was present. Intraoperatively, single-port VATS was performed. After inspection of the chest cavity, the dislocated rib fractures were localized. Subsequently, a 2 cm incision was made to expose the fracture. Osteosynthesis was achieved using the MatrixRIB intramedullary splint system (Synthes, Germany). In 4 patients, wedge resections of traumatized lung by the fractured ribs were necessary. In one case, a diaphragm lesion was sutured. Mean operating time was 53 minutes. The intra- and postoperative course was uneventful. Mean hospital stay was 4 days. In all patients, excellent chest wall stability was achieved. Moreover, a significant reduction of pain as assessed by VAS was observed (2 postoperatively vs. 8 preoperatively,  $p < 0.05$ ).

### Conclusion:

VATS-Rib using intramedullary splints represents a simple and safe treatment option for patients with dislocated rib fractures. In comparison to the routinely used angle-stable plates, smaller incisions are necessary for inserting the splints causing less surgical trauma. This method leads to a significant reduction of pain caused by fractured ribs and allows for a faster recovery after chest wall Trauma.

**Disclosure:** No significant relationships.

**P-221****A 20 YEAR REVIEW OF PECTUS SURGERY: AN ANALYSIS OF FACTORS PREDICTIVE OF RECURRENCE AND OUTCOMES**

Theofano Tikka, R. Steyn, E. Bishay, M. Kalkat, B. Naidu, P. Rajesh

*Thoracic Surgery, Birmingham Heartlands Hospital, Heart of England NHS Foundation Trust, Birmingham, United Kingdom*

**Objectives:**

Audit outcomes of pectus surgery and investigate potential predictive factors of pectus recurrence.

**Methods:**

A retrospective review of 297 patients who underwent repair of pectus deformity between 1994 and 2014. Patients medical records were reviewed for demographics; type of surgical correction; length of hospital stay; post-operative complications; pectus recurrence and duration of bar stay. Survival analysis methods and repeated events analysis were performed to identify predictor factor for pectus recurrence.

**Results:**

297 patients were included (262 males; 35 females), mean age of 19.8 years (range, 9 to 45). Mean length of hospital stay was 4.7 days (range 1 to 21). 167 patients had surgery for pectus excavatum; 116 for carinatum. 153 patients received a modified Ravitch without bar insertion; 72 with insertion of bar. 53 patients underwent Nuss repair. 85 patients had their bars removed, on an average of 18.5 months after surgery. The main complications were wound infection (3%) and post-operation bleeding (2.3 %). Pectus recurrence rate was 9.4% (28/297). Type of operation was a highly significant factor of pectus first recurrence ( $p=0.0002$ ) (figure1). A repeated event analysis, confirmed that patients treated with a bar were 2.7 times more likely to have further recurrences ( $p=0.0078$ ; 95% CI 1.3 - 5.8). In those patient treated with a bar, time of bar removal was a statistically significant predictive factor of first recurrence ( $p=0.0112$ ; OR: 1.054; 95% CI 1.054-1.011). Presence of complication post operation only marginally failed to yield statistically significant results ( $p=0.064$ ).



1: Ravitch without insertion of bar; 2: Ravitch with insertion of bar; 3: NUSS operation; 4: Ravitch with insertion of plate

**Conclusion:**

Pectus surgery can be performed with low morbidity. Type of operation; bar insertion and length of bar stay are predictive factors of pectus recurrence.

**Disclosure:** No significant relationships.

P-222

**PLEURAL ENDOTHELIAL PROGENITOR CELL LEVELS IMPACT CANCER RECURRENCE AND SURVIVAL IN PATIENTS WITH EARLY-STAGE NON-SMALL-CELL LUNG CARCINOMA**

Lucio Cagini<sup>1</sup>, M. Andolfi<sup>1</sup>, J. Vannucci<sup>1</sup>, M. Pirro<sup>2</sup>, M.R. Mannarino<sup>2</sup>, F. Bagaglia<sup>2</sup>, R. Potenza<sup>1</sup>, S. Ceccarelli<sup>1</sup>, F. Puma<sup>1</sup>, E. Mannarino<sup>2</sup>

<sup>1</sup>*Surgical Science, Thoracic Surgery Unit, University of Perugia, Perugia, Italy*

<sup>2</sup>*Internal Medicine, Unit of Internal Medicine, Angiology and Arteriosclerosis Diseases, University of Perugia, Perugia, Italy*

**Objectives:**

Endothelial progenitor cells (EPC) are a subtype of stem cells that are capable of contributing to neovascularization in tumors. In a previous report of our group we showed that an acute post-surgery EPC raise in the blood is able to predict an increased risk of cancer recurrence and death in early stages of non-small-cell lung cancer (NSCLC). The aim of the study was to evaluate in the postoperative pleural fluid of patients with early stages of NSCLC, the influence of the EPC level on cancer recurrence and survival.

**Methods:**

We measured the number of EPCs in the postoperative pleural fluid of patients submitted to radical lung resection for early stages NSCLC and for benign diseases (control group). Pleural EPC levels were quantified by FACS analysis 48 hours after surgery in 70 patients with NSCLC stages I and II (median age 65 years (ranging 38-84), 71% male) and in 20 patients of control group. Cancer recurrence and survival rates were also evaluated in NSCLC patients according to the high or low EPC level in pleural fluid.

**Results:**

The base 10 logarithmic [log] number of EPCs was higher in the post-surgery pleural fluid of patients with NSCLC than in control group [P <0.05]. NSCLC patients undergoing surgery were divided in two groups according to the 75<sup>th</sup> percentile of pleural fluid EPCs; patients with high pleural EPC levels had a significantly higher rate of cancer recurrence/death than patients with lower pleural EPC levels, irrespective of confounders.

**Conclusion:**

EPC levels are higher in the postoperative pleural fluid of patients with NSCLC than in control group. The presence of high EPC levels after pulmonary resection of patients with early NSCLC is able to predict an increased risk of cancer recurrence and death.

**Disclosure:** No significant relationships.



P-223

**EFFECTIVENESS OF PREOPERATIVE LOCALIZATION USING FRAGMENTED PLATINUM MICROCOIL FOR FLUOROSCOPY-AIDED THORACOSCOPIC RESECTION OF SOLITARY PULMONARY NODULES**Deog Gon Cho<sup>1</sup>, Y.J. Chang<sup>1</sup>, K.D. Cho<sup>1</sup>, H.J. Park<sup>2</sup><sup>1</sup>*Department of Thoracic and Cardiovascular Surgery, St. Vincent's Hospital, College of Medicine, Catholic University of Korea, Suwon, Gyeonggi-do, Korea*<sup>2</sup>*Department of Radiology, St. Vincent's Hospital, College of Medicine, Catholic University of Korea, Suwon, Gyeonggi-do, Korea***Objectives:**

Preoperative localization is necessary to perform thoracoscopic resection of small or deeply located solitary pulmonary nodules (SPNs). We recently developed a new localization technique using a self-made, fragmented platinum microcoil, and retrospectively compared the effectiveness of our technique with that of contrast materials as lipiodol and barium.

**Methods:**

One hundred patients underwent thoracoscopic wedge resections for 104 SPNs between January 2006 and December 2014. Self-made, fragmented platinum microcoils (Easimarker) were targeted to localize 52 SPNs [30 solid, 22 ground glass opacities (GGOs)] in 50 patients (Group A), and lipiodol or barium was injected in 52 SPNs (28 solid, 24 GGOs) of 50 patients (Group B). Preoperative localization using targeting materials was performed into, or just around the lesions on the day of thoracoscopic surgery in the room of chest CT scanner. Localized SPNs were then, wedge resected using fluoroscopy-aided thoracoscopic surgery (FATS). The intraoperative fluoroscopic exposure (radiation) time, diagnostically detecting rate of pathologic lesions, and other clinical data were collected.

**Results:**

Mean size and depth of SPNs in group A and B were  $10.0 \pm 4.9$  mm (range: 2.2 to 27) versus  $9.0 \pm 4.8$  mm (1 to 21), and  $11.7 \pm 8.2$  mm (1 to 30) versus  $10.5 \pm 7.7$  mm (1 to 28.2), respectively. CT-guided localizations were successfully performed in both groups. No mortality and major morbidity were observed in both groups. All lesions in both groups were completely resected and diagnosed histopathologically. The fluoroscopic exposure time of group A ( $46.3 \pm 36.9$  seconds) was significantly shorter than that of group B ( $58.6 \pm 81.1$  seconds).

**Conclusion:**

Our technique using fragmented platinum microcoils appears to be effective and feasible in that it has shorter radiation exposure time. Once inserted microcoil into the pulmonary lesion stays firmly and more visible radiologically, through contrast materials tend to disperse outside the targeting lesion.

**Disclosure:** No significant relationships.

P-224

**PAIN THERAPY OF POST-THORACOTOMY PAIN - A PROSPECTIVE COMPARISON OF THREE DIFFERENT ESTABLISHED PAIN THERAPIES**Holger Hendrix<sup>1</sup>, V. Kamlak<sup>1</sup>, R. Hilgers<sup>2</sup>, M. Behne<sup>3</sup>, F. Noack<sup>1</sup><sup>1</sup>*Thoracic Surgery, Kliniken Maria Hilf GmbH, Moenchengladbach, Germany*<sup>2</sup>*Medical Statistics, University Hospital RWTH Aachen, Aachen, Germany*<sup>3</sup>*Anaesthesiology and Intensive Care Medicine, Kliniken Maria Hilf GmbH, Moenchengladbach, Germany***Objectives:**

Post-Thoracotomy pain is one of the most severe types of postoperative pain and an efficient pain management is a main goal after thoracotomy. Thoracic epidural analgesia is considered the “gold standard” for post-thoracotomy analgesia, but it’s not suitable for every patient. In these cases a continuous infusion of a local anesthetic by an extrapleural placed catheter might be an adequate therapy as described in the literature. This possible therapeutic alternative is however not used regularly. Thus we developed this prospective study to examine the therapeutic effectiveness using an extrapleural placed catheter in comparison with two other established pain therapies.

**Methods:**

We conducted a comparative prospective three arm parallel group cohort study in patients undergoing a thoracotomy. The three treatment consists combined oral and intravenous pain medication (group A), continuous infusion of a local anesthetic by an extrapleural placed catheter (group B) and thoracic epidural analgesia (group C). Pain intensity was assessed on a visual analog scale every day at 7, 13, 19 and 22 o'clock starting the day before surgery up to day 5 after surgery.

**Results:**

From January 2011 to September 2013 a total of 110 patients (30 group A, 40 group B and C each) were included in the study. The mean pain scores of each day and total pain score values were calculated. Total pain score does not differ between the treatment groups, group A  $2,96\pm 1,36$ ; group B  $3,29\pm 1,42$ ; group C  $2,96\pm 1,60$  ( $p=0.5269$ ). Cumulative mean oxycodone dose group A  $191\text{ mg}\pm 117$ ; group B  $45\text{ mg}\pm 98,6$ ; group C  $103\text{ mg}\pm 110$ . We observed statistical significant group differences with respect to oxycodone dose ( $p<.0001$ ) and treatment duration ( $p=0.0138$ ). A main side effect was catheter dislocation in group B and C.

**Conclusion:**

A continuous infusion of a local anesthetic by an extrapleural placed catheter is an effective alternative in the treatment of post-thoracotomy pain.

**Disclosure:** H. Hendrix: study supported by the Pajunk company; fee for a single lecture at a customer meeting of the Pajunk company in Dresden Germany September 2011.

R. Hilgers: fee for the statistical analysis by the Pajunk company.

P-225

**A SPECIALIST WARD BASED ACUTE CARE UNIT IS ESSENTIAL AND COST EFFECTIVE FOR A TERTIARY THORACIC UNIT WITH MINIMAL REQUIREMENT OF CRITICAL CARE IN THE ENHANCED RECOVERY ERA**

Mehmood Jadoon, F. Chowdhry, J. Williams, A. Nakas, D. Waller, S. Rathinam  
*Thoracic Surgery, Glenfield Hospital, Leicester, United Kingdom*

**Objectives:**

Thoracic surgery in the UK is pushing boundaries with surgery offered to elderly and patients with comorbidities based on the tripartite risk assessment of the SCTS BTS guidelines. There is variation in post-operative care. We analysed our activity of patients who were admitted to ACU post operatively from April 2009 to April 2014 to evaluate its impact.

**Methods:**

ACU model: Our patients are nursed on a stand-alone thoracic acute care unit (ACU) traditionally called HDU but does not meet current level 2 critical care criteria. It offers invasive monitoring, management of Epidural pain catheters and non-invasive ventilation. Patients have regular physiotherapy and ambulatory epidural care for pain relief. The unit is manned by thoracic surgical staff with support from out reach and ICU. The retrospective analysis was performed from prospectively collected data. The cost benefits were analysed on the basis of our ACU admissions based on our criteria.

**Results:**

4079 patients underwent surgery in our unit. 1848 (45%) patients were admitted to ACU post-operatively (Table 1). Average ACU stay was 1.2 days (Median 1 day). Most patients needed low flow oxygen and volume replacement only.

1.	Open anatomical Lung resections	874
2.	Mesothelioma surgery	152
3.	Decortications	240
4.	Chest wall and diaphragmatic procedures	109
5.	Mediastinal mass excisions	99
6.	Oesophageal procedures	11
7.	Tracheal surgery	13
8.	VATS Lobectomy	151
9.	VATS LVRS	132
10.	Pectus repair	19
11.	VATS mediastinal mass excisions	25

285 patients required ICU care. 86 were planned while 199 were unplanned admissions. Current critical care capacity will not allow us to perform our current activity. It offers financial savings as the nursing ratio is less and the bed tariff is lesser at 837 pounds per day in ACU compared to 1025 pounds per day critical care level 2 tariff.

**Conclusion:**

A Specialist Thoracic ACU which is properly equipped and managed by trained staff is essential in managing patients after major thoracic surgery. These patients can be managed very safely and effectively and at one half financial cost compared to ICU.

**Disclosure:** No significant relationships.



P-226

## THE ROLE OF ENDOTHELIAL CELL ACTIVATION AND VON WILLEBRAND FACTOR IN TUMOR-ASSOCIATED HYPERCOAGULATION AND METASTASIS FORMATION OF LUNG CARCINOMA

Ioannis Karampinis<sup>1</sup>, A. Bauer<sup>2</sup>, P. Hohenberger<sup>3</sup>, S. Schneider<sup>2</sup>, K. Nowak<sup>1</sup>

<sup>1</sup>*Department of Surgery, Mannheim University Medical Center, Mannheim, Germany*

<sup>2</sup>*Department of Experimental Dermatology, Mannheim University Medical Center, Mannheim, Germany*

<sup>3</sup>*Division of Surgical Oncology and Thoracic Surgery, University Medical Centre Mannheim, Mannheim, Germany*

### Objectives:

Cancer patients hold a high risk for venous thromboembolism associated with poor prognosis due to an enhanced incidence of metastasis. For extravasation and formation of new metastatic foci, circulating tumor cells need to interact with the vascular endothelium. How this interaction promotes cancer-driven hypercoagulation and metastasis remains unclear. Our previous studies demonstrate that tumor cells release VEGF-A followed by activation of endothelium, release of inflammatory cytokines and the procoagulatory protein von Willebrand factor (VWF) switching the vessel wall into a pro-inflammatory and pro-coagulatory surface. VWF forms intraluminal fibers mediating platelet binding and aggregation. We postulate that VWF fibers in tumor vessels promote tumor-associated coagulation and metastasis.

### Methods:

53 patients with biopsy-proven lung cancer and 15 healthy controls were included in this study under written consent. The local ethic committee approved the study. Endothelial cell activation was examined locally in tissue sections with high resolution fluorescence microscopy and systemically by determination of the levels of VEGF-A and Ang-2 in citrated serum samples. Systemic levels of VWF antigen were quantified and the activity of the VWF degrading enzyme ADAMTS13 was measured.

### Results:

Evaluation of tumor tissue using immunofluorescence demonstrated pronounced VWF fiber formation and platelet aggregation in tumor vasculature. Analysis of blood samples of lung cancer patients showed significantly increased levels of VWF in tumor patients compared to healthy control. The markers for endothelial cell activation Ang-2 and VEGF-A were clearly increased in tumor patients. A decreased- non significant enzymatic activity of ADAMTS13 was found.

### Conclusion:

Our support the hypothesis that the tumor microenvironment stimulates the endothelial activation and release of VWF in lung cancer. Our findings implicate a mechanism wherein locally inhibited ADAMTS13 activity promotes VWF fiber formation mediating platelet binding and occlusion of tumor vessels. In conclusion, further studies are needed to explain the biological role of VWF in tumor progression.

**Disclosure:** No significant relationships.

P-227

**ESTABLISHMENT OF A NEW MOUSE MODEL FOR POSTOPERATIVE ACUTE EXACERBATION OF INTERSTITIAL LUNG DISEASES**

Toru Kimura<sup>1</sup>, T. Nojiri<sup>1</sup>, H. Hosoda<sup>2</sup>, Y. Shintani<sup>3</sup>, M. Inoue<sup>3</sup>, M. Miyazato<sup>2</sup>,  
M. Okumura<sup>3</sup>, K. Kangawa<sup>2</sup>

<sup>1</sup>*Department of Biochemistry, National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan*

<sup>2</sup>*Department of Biochemistry, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan*

<sup>3</sup>*Department of General Thoracic Surgery, Osaka University Graduate School of Medicine, Osaka, Japan*

**Objectives:**

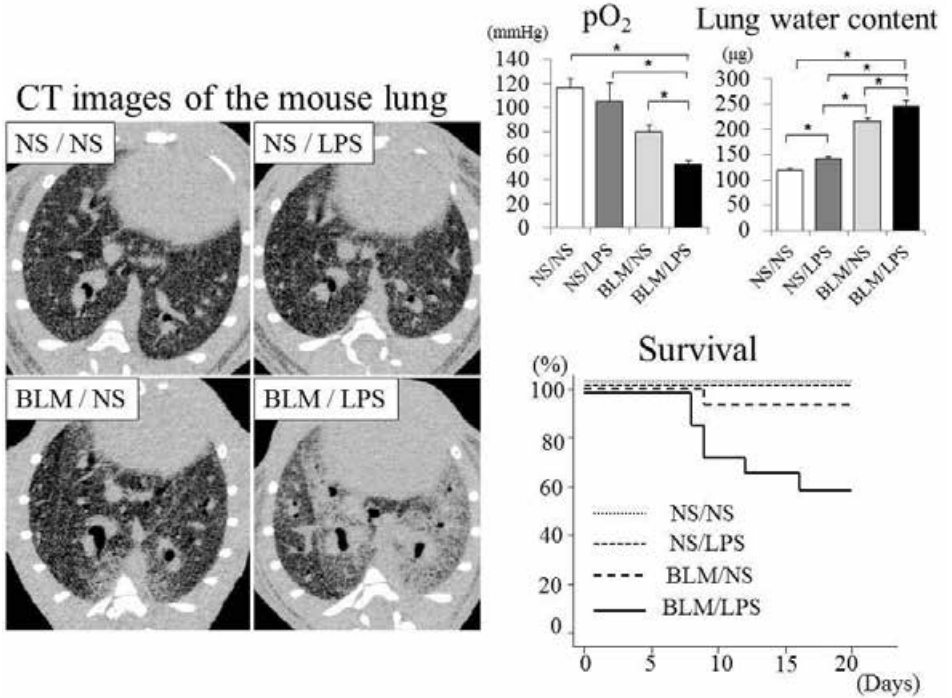
Interstitial lung diseases (ILDs) are sometimes seen in patients with primary lung cancer. Although a severe inflammatory reaction after lung resection can lead to acute exacerbation (AE) of ILDs, which is a potentially fatal complication, no prophylactic treatments for postoperative AE have been established. Prophylaxis for postoperative AE is imperative for thoracic surgeons. The objective of this study was to establish a new mouse model of AE of ILDs to investigate prophylactic interventions.

**Methods:**

C57BL/6 mice were intratracheally administered normal saline (NS) or bleomycin (BLM, 1 mg/kg) on Day 0 to induce pulmonary fibrosis, and NS or lipopolysaccharide (LPS, 10 µg) to induce subtle inflammatory stimulation on Day 7. Mice were divided into four groups: NS/NS group, NS/LPS group, BLM/NS group, and BLM/LPS group. Computed tomography (CT) images of the lung, histological changes, lung water content, oxygen partial pressure (pO<sub>2</sub>) of arterial blood, and cell counts and inflammatory cytokine levels in bronchoalveolar lavage fluid (BALF) and were assessed on Day 8. Survival rates were also determined.

**Results:**

Total cell and neutrophil counts, and levels of cytokines such as monocyte chemoattractant protein-1, interleukin-6, and keratinocyte chemoattractant in the BALF of mice were significantly elevated in the BLM/LPS group. The most severe inflammatory reaction was evident in the BLM/LPS group, with increased infiltrating cells on histopathology and increased lung water content. In the BLM/LPS group, chest CT showed diffuse ground-glass opacities, and pO<sub>2</sub> was significantly decreased. These findings mimic AE of human ILDs. Furthermore, survival curves demonstrated that the BLM/LPS group had the lowest survival rate among all groups.



**Conclusion:**

A new mouse model of AE of ILDs that represents an attractive experimental method for pre-clinical research of the postoperative management and prophylactic interventions for AE of ILDs of lung cancer patients was developed.

**Disclosure:** No significant relationships.

P-228

**RESULTS OF A PHASE I PROOF-OF-CONCEPT STUDY FOR MEDIASTINAL LYMPHNODE-BIOPSIES BASED ON TRANSORAL ENDOSCOPIC SURGERY**W. Klemm<sup>1</sup>, A. Nemat<sup>2</sup>, Gunda Leschber<sup>1</sup>, T. Wilhelm<sup>3</sup><sup>1</sup>*Department of Thoracic Surgery, ELK Berlin Chest Hospital, Berlin, Germany*<sup>2</sup>*Thoracic Surgery, SANA Kliniken Duesseldorf, Gerresheim, Duesseldorf, Germany*<sup>3</sup>*Otolaryngology, Head/neck & Facial Plastic Surgery, SANA Kliniken Leipziger Land, Borna, Germany***Objectives:**

Video-assisted mediastinoscopy (VAM) represents the standard operating procedure for mediastinal lymph node biopsies. However, there are limitations of the procedure; especially younger people might be affected by the scar in the frontal neck region. We, therefore, developed a trans-oral approach for mediastinoscopy (TOEMS). In previous studies using cadaver and pigs the feasibility of the new procedure was proofed. It was unclear whether TOEMS can be safely used in clinical routine.

**Methods:**

We conducted a clinical phase I study recruiting ten patients with unclear mediastinal lymphadenopathy. All patients underwent TOEMS for mediastinal lymph node biopsy. Duration of the procedure, length of hospitalisation and complications were monitored. In addition, all patients were examined for pain, changes in sensibility and other clinical parameters.

**Results:**

TOEMS was accomplished in eight patients. In two patients the operation was converted to VAM due to technical problems. Mediastinal lymph nodes were achieved in all patients who underwent TOEMS. On average, two separate lymph stations were reached by TOEMS. Duration of the procedure was 159±22 min. Postoperatively, permanent palsy of the right recurrent laryngeal nerve was noticed in one patient.

**Conclusion:**

Trans-oral endoscopic surgery seems to be a feasible and scarless approach for mediastinal lymph node biopsies. Further studies are needed to show whether this approach has an advantage over VAM in terms of pain, complications and accessibility of mediastinal lymph node stations.

**Disclosure:** W. Klemm: The study was supported by KARL STORZ Endoskope GmbH and Co, Germany and INOMED Medizintechnik, Germany.

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P-229

**THE EFFICIENCY OF HEMOSTATIC GALENIC EXTRACT ANKAFERD IN CYST HYDATID SURGERY AS A GERMICIDAL AGENT**

Bayram Metin<sup>1</sup>, N. Yılmaz<sup>2</sup>, Y.E. Beyhan<sup>3</sup>, C. Babür<sup>3</sup>, H. Ede<sup>4</sup>, Y.S. Intepe<sup>5</sup>

<sup>1</sup>*Thoracic Surgery Department, Bozok University, Faculty of Medicine, Yozgat, Turkey*

<sup>2</sup>*Department of Infectious Diseases, Bozok University, Faculty of Medicine, Yozgat, Turkey*

<sup>3</sup>*Division of Public Health Affairs, Ministry of Health, Ankara, Turkey*

<sup>4</sup>*Cardiology, Bozok University, Faculty of Medicine, Yozgat, Turkey*

<sup>5</sup>*Department of Chest Diseases, Bozok University, Faculty of Medicine, Yozgat, Turkey*

**Objectives:**

Basic principle in the treatment of cyst hydatid is total surgical removal of cyst and inner content. To avoid any intraoperative contamination during the surgery, surroundings of the cyst is covered with tissue compresses wetted by germicidal liquid since scoleces in the cystic fluid have potential to generate new cysts via contaminating neighboring tissues. In this study, we aimed to compare efficiency of ankaferd, known for its hemostatic as well as antifungal and antibacterial activities to efficiencies of other germicidal agents on cyst hydatid.

**Methods:**

Ten cysts were randomly obtained from the relevant tissues. To determine viability of protoscoleces in the cystic fluids obtained from relevant tissues, sample of one-cc fluid from ten cysts were separately dyed with 0.1% eosin and each sample was examined microscopically, and then all protoscoleces in each sample were counted and the ratio of vivid protoscoleces was expressed as viability percentage of the cyst in concern. Six samples of 5-cc cystic fluid without any dye were drawn from each of four cysts with the highest viability percentage among ten cysts. Group 1 was mixed with 20% hypertonic NaCl, Group 2 with betadine solution, Group 3 with ankaferd, Group 4 with liquefied 20% andazole solution (prepared by using 2 grams of andazole with 100 cc distilled water), group 5 with 0.1% eosin and group 6 with distilled water. Following the enrollment, four 5-cc samples of all six groups were examined microscopically at fifth, tenth and fifteenth minutes to determine viability rate of protoscoleces at relevant time in each group after dying with 0.1% eosin. Protoscoleces was assumed to lose their viability when they lose their ellipsoid shape while shrinking and rounding in size, and developing vacuolar degeneration with intracellular eosin intake.

**Results:**

	5 <sup>th</sup> minute	10 <sup>th</sup> minute	15 <sup>th</sup> minute
Andazole group	99,5±1,0	98,0±2,2	95,8.0±3,3
Betadine solution group	62,5±18,5	11,0±1,2	3,0±2,5
Hypertonic NaCl solution group	82,8±6,6	21,8±2,4	1,8±2,4
Ankaferd group	25,0±4,1	3,5±1,3	0,0±0,0
Eosin group	99,5±1,0	98,5±1,9	96,8±1,0
Distilled water group	99,8±0,5	99,5±0,6	98,8±1,0

The most efficient agent at 5<sup>th</sup> minute was ankaferd as germicidal agent.

**Conclusion:**

Ankaferd can be very beneficial germicidal agent.

**Disclosure:** B. Metin: Ankaferd

P-230

**EFFICACY OF THE REPEL-CVR ADHESION BARRIER TO PREVENT SURGICAL ADHESIONS IN A REMEDIASTINOSCOPY RAT MODEL**Berkant Özpolat<sup>1</sup>, N. Günel<sup>1</sup>, Z. Pekcan<sup>2</sup>, E.Ş. Ayva<sup>3</sup>, Ö. Bozdoğan<sup>4</sup>, K. Dural<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, Kırıkkale University School of Medicine, Kırıkkale, Turkey*<sup>2</sup>*Department of Surgery, Kırıkkale University Faculty of Veterinary, Kırıkkale, Turkey*<sup>3</sup>*Department of Pathology, Başkent University School of Medicine, Ankara, Turkey*<sup>4</sup>*Department of Pathology, Ankara Numune Education and Research Hospital, Ankara, Turkey***Objectives:**

Remediastinoscopy could be risky because of adhesions at the previous mediastinoscopy tract. The aim of this experimental study was to evaluate and compare the efficacy of a bioresorbable polymeric film barrier on adhesion formation in a re-mediastinoscopy rat model.

**Methods:**

Superior mediastinal dissection was done in 28 Wistar rats. Group 1 (sacrificed at day 30), Group 2 (single layer Repel-cv was placed on trachea and sacrificed at day 30), Group 3 (single layer was placed and sacrificed at day 60), Group 4 (double layer was placed and sacrificed at day 60). Macroscopic and histopathologic analysis was performed to evaluate and compare mediastinal adhesions, degree of inflammation, vascular proliferation, foreign body reaction and fibroblast proliferation.

**Results:**

Macroscopic dissection showed dense adhesions in Sham Group and Group 3 ( $p < 0.05$ ). Histopathologic examination showed significant difference between groups when the foreign body reaction and fibroblast proliferation was evaluated ( $p < 0.05$ ) but not in terms of inflammation and vascular proliferation ( $p > 0.05$ ).

**Conclusion:**

This experimental study showed that Repel-cv was effective as single layer application at day 30 and as double layer application at day 60. At clinical conversion, the formation of adhesions might be decreased to provide a safer remediastinoscopy.

**Disclosure:** No significant relationships.

P-231

**EFFICACY OF PARAVERTEBRAL CONTINUOUS INFUSION ANALGESIA IN VATS PATIENTS. A PROSPECTIVE RANDOMIZED STUDY**

Alessandro Rizzi<sup>1</sup>, F. Raveglia<sup>1</sup>, P. Di Mauro<sup>2</sup>, A. Leporati<sup>1</sup>, A. Baisi<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Università degli Studi di Milano, AO San Paolo, Milan, Italy*

<sup>2</sup>*Anaesthesiology, AO San Paolo, Milan, Italy*

**Objectives:**

We have recently published an innovative analgesic technique consisting of intra-operative paravertebral catheter (PC) placement and local analgesic continuous infusion, in VATS patients. We now present the results of a prospective, randomized single center study comparing this procedure with the current gold-standard, opioid intravenous patient controlled analgesia (IVPCA).

**Methods:**

From January to July 2014, thirty-nine patients submitted to VATS lung resection (2 ports + mini-thoracotomy) have been randomized into two homogenous groups for the administration of analgesic drugs, through PC + IVPCA (morphine 1 mg/1ml bolus, lock out 10 minutes) in "group A" or IVPCA alone in "group B". In "group A", Tuohy needle was percutaneously introduced below parietal pleura in the same intercostal space as the camera port by the operating surgeon. PC was pushed through the needle until paravertebral space. Postoperative analgesia was performed by continuous infusion of local analgesic (naropine 3,75%, 7 ml/h). The following parameters have been recorded on scheduled postoperative days, every morning up to chest tube removal: a) pain control using visual analogue scale b) respiratory function using FEV1 and ambient air saturation c) morphine-equivalent demanded/administered. Records have been analyzed with Mann-Whitney or Student's tests for independent variables.

**Results:**

No complications in PC placement were recorded. Significant differences have been found in favor of group A concerning both rest and cough pain control ( $p=0.01$  and  $0.034$ ) and respiratory function in terms of FEV1 ( $p=0.019$ ). No difference was recorded concerning ambient air saturation ( $p=0.06$ ) (Table 1). Group A had significant lower mean morphine-equivalent demanded (5.47 mg vs 9 mg) and consumption (4.76 mg vs 8.38 mg).

**Conclusion:**

Intra-operative PC placement has been safe and easy to perform. Local analgesic paravertebral continuous infusion has been effective and allowed lower morphine consumption. We recommend this procedure in VATS patients.

**Disclosure:** No significant relationships.





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**VIDEO ASSISTED THORACOSCOPIC BILATERAL CERVICO-THORACIC SYMPATHECTOMY FOR RECURRENT UNCONTROLLED ARRHYTHMIAS IN A PATIENT OF JERVELL AND LANGE-NIELSEN SYNDROME**Kamran Ali, A. Khan*Minimally Invasive Thoracic Surgery, Medanta the Medicity, Gurgaon, India***Objectives:**

Jervell and Lange-Nielsen syndrome (JLNS) is a type of long QT syndrome, associated with severe, bilateral sensorineural hearing loss. If untreated it can lead to syncope, seizures, or sudden death. The usual management is using beta blockers, however surgical sympathetic denervation is required in refractory cases. We present a video showing VATS bilateral cervico-thoracic sympathectomy for one such patient.

**Case description:**

We had a 3 year male child who was having recurrent ventricular arrhythmias. He suffered 3 cardiac arrests inspite of being managed with highest doses of Propranolol. So he was referred to us by the pediatric cardiologist for a minimally invasive surgical management. Bilateral 3 port VATS hemistellate ganglionectomy and T2, T3 and T4 ganglionectomy was performed. The intraoperative course was uneventful and there were no ectopics or hemorrhage. Post operatively he was extubated and he did not experience any more arrhythmias and was kept on maintenance doses of Propranolol which was gradually tapered off and patient discharged on 4<sup>th</sup> postoperative day.

**Conclusions:**

Thoracoscopic denervation surgery, offers a safe and effective treatment option for patients with prolonged QT syndrome refractory to medical management.

**Disclosure:** No significant relationships.

P-233

**A BULLET EXTRACTED FROM THE RIGHT PULMONARY ARTERY AFTER A GUNSHOT IN THE LEFT HEMITHORAX**Fatmir Caushi<sup>1</sup>, X. Spanishi<sup>2</sup>, A. Hatibi<sup>3</sup>, R. Kortoci<sup>3</sup>, I. Skenduli<sup>1</sup>, L. Lisha<sup>1</sup><sup>1</sup>*Thoracic Surgery, University Hospital of Lung Diseases, Tirana, Albania*<sup>2</sup>*General Surgery, Regional Hospital, Durres, Albania*<sup>3</sup>*ICU, University Hospital of Lung Diseases, Tirana, Albania***Objectives:**

Most gunshot wounds result in an entrance and exit wound. In cases of absence of an exit wound sometimes, these missiles are seen in other areas with screening radiographs. The bullet may migrate depending upon the forces of gravity, coughing, swallowing, blood flow, or local erosion. In cases of civil trauma firearm bullets penetrating the pulmonary veins, left and right heart, aorta or large-caliber arteries of the thorax, abdomen and limbs may haven't enough energy to transfix the vessel, but only to penetrate it. So, they travel through the blood flow until occluding a peripheral artery in a site that is distant from the initial perforation. Migration of bullets from systemic veins to the right heart appears to occur more commonly than migration into the pulmonary arterial tree.

**Case description:**

A boy of 16 years old was recovered in emergency room for a wound in the left hemithorax cause by an IED (improvised explosion device) that he himself had produced. He underwent in the operation room a left anterior thoracotomy at the level of the wound meanwhile that was under resuscitation procedures and blood transfusion. Inside hemithorax was found a large quantity of coagulated blood and also was observed a hole in the myocardium that was clamped and sutured. The CT-scan of the thorax after the surgery showed the presence of the "corpus alien" in the right lung hilum. So the patient underwent a second surgery in a specialized center of thoracic surgery through an antero-lateral right thoracotomy without the use of Cardio-Pulmonary Bypass. During preparation at the "Crest of Boyd", it was found a bullet inside of the pulmonary artery that was extracted through an arteriotomy.

**Conclusions:**

This case highlights the importance of repeated scanning for the possibility of projectile migration within the cardiovascular system in similar cases of penetrating injury.

**Disclosure:** No significant relationships.



P-234

**EXTRA-COSTAL PARAVERTEBRAL ANAESTHESIA - THE LIGHT AT THE END OF THE TUNNEL**Rohith Govindraj*Department of Thoracic Surgery, Nottingham City Hospital, Nottingham, United Kingdom***Objectives:**

Epidural anaesthesia and paravertebral catheter are the proven standard methods of achieving adequate pain control in the post-operative period after Thoracic surgical procedures. However, the patient suitability for these techniques may be questionable in scenarios where patient may have resection of parietal pleura or in presence of ongoing infections. Extra-Costal Paravertebral Anaesthesia (EPA) is a novel technique that is developed for dealing with such scenarios and showed excellent pain control in patients.

**Case description:**

Adequate pain management adds to positive outcome in patients having thoracic surgical procedures via thoracotomy or VATS. This can be quite a challenge to the Anaesthetic team even with an Epidural or Paravertebral Catheter although these may not be used in certain situations where patient may need one or more of the following procedures - Pleurectomy, Extra-Pleural Pneumonectomy, chest wall resection, lung cancer resection (T3 Tumours) needing pleural resection due to tumour infiltration to adjacent pleura, decortication for empyema etc. Extra-Costal Paravertebral Anaesthesia (EPA) is a new technique that was although invented as an experimental approach to help provide an alternate method of analgesia in the above group of patients but showed excellent pain control in all these cases. The technique involves an initial step of creating a space under the paraspinal muscles outside the costal margin spanning a length of 4-5 Cms longitudinally covering 3-4 desired intercostal spaces. An infusion catheter is then introduced via a spinal needle into this space and secured in place. The local anaesthetic agent via a pump is then connected and run at a rate variable to reach adequate pain control.

**Conclusions:**

Extra-Costal Paravertebral Anaesthesia with its ease of application, safety and patient compliance added with comparable pain scores and adequacy of analgesia could eventually be an alternative to current techniques of pain management in all types of thoracic surgical procedures.

**Disclosure:** No significant relationships.

P-235

**TENSION PNEUMOCEPHALUS COMPLICATING SUPERIOR SULCUS TUMOR RESECTION**

S. Kanbur Metin<sup>1</sup>, M. Demir<sup>1</sup>, Deniz Güre<sup>1</sup>, H. Yılmaz<sup>1</sup>, B. Güre<sup>2</sup>, C. Tezel<sup>1</sup>, V. Baysungur<sup>1</sup>

<sup>1</sup>*Department of Thoracic Surgery, Sureyyapasa Chest Diseases Training and Research Hospital, Istanbul, Turkey*

<sup>2</sup>*Department of Neurosurgery, Fatih Sultan Mehmet Training and Research Hospital, Istanbul, Turkey*

**Objectives:**

Pneumocephalus is the presence of air at subarachnoid cavity. Subarachnoid-pleural fistula after superior sulcus tumor resection induced pneumocephalus is a very rare complication. Tension pneumocephalus causing neurological deficit may need neurosurgical decompression.

**Case description:**

Fifty-five year-old man was admitted with chest pain. Radiological evaluation revealed a right upper lobe mass. Tissue obtained by transthoracic biopsy was positive for non-small cell lung cancer. There was no evidence of metastatic disease. A Right upper lobectomy with en-bloc resection of first, second and third ribs by desarticulation of vertebral joints were performed. On the 2<sup>nd</sup> postoperative day, the patient became lethargic with progressive right hemiparesis. An emergent computed tomography of the brain revealed bilateral pneumocephalus compressing the neural parenchyma. Tension pneumocephalus was decompressed by bilateral frontal burr-holes. After neurosurgical decompression, patient was awake and neurologically intact. The postoperative course was uneventful, and the patient was discharged in a stable condition on postoperative 14<sup>th</sup> day.

**Conclusions:**

Pneumocephalus complicating superior sulcus tumor resection is a rare condition with less than 20 cases have been reported in the literature. To best of our knowledge, this is the first case report presented in the English literature, that superior sulcus tumor resection causing tension pneumocephalus needing neurosurgical decompression.



Figure 2. Brain computed tomography showed Pneumocephalus.

**Disclosure:** No significant relationships.

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**THORACOTOMY IS A PAIN RELIEVING STRATEGY IN THE ABSENCE OF A PULMONARY ARTERY**David Healy<sup>1</sup>, N. Abbas<sup>1</sup>, C. Gallagher<sup>2</sup><sup>1</sup>*Department Thoracic Surgery, St Vincent's University Hospital, Dublin, Ireland*<sup>2</sup>*Respiratory Medicine, St Vincent's University Hospital, Dublin, Ireland***Objectives:**

The specialist pain services referred a 26 year old lady with chronic intractable right chest pain. She had been through a significant spectrum of therapies including a methadone trial. No therapy was successful and implantable stimulators were under consideration. She was referred for surgical advice.

**Case description:**

The patient on assessment with a CT Thorax had a congenitally absent right pulmonary artery and a hypoplastic right lung. She had moderate bronchiectasis, but did report repeated chest infections and haemoptysis. She reported dyspnoea at rest and on exertion and in addition she desaturated on a walk test (88%). This had prompted her to be placed on continuous home oxygen 2 years prior to referral and she was on 2-5L at the time of referral. A thorough assessment was performed in conjunction with the cystic fibrosis group. No additional congenital abnormalities were identified. Her VQ scan showed 94% perfusion of her left lung and 54% ventilation. She had a number of major arterio-pulmonary collateral arteries (MAPCAs) to the right side. She was assessed over a three month period, during which intensive bronchiectasis therapy improved her condition and reduced her oxygen requirement. After deliberation she proceeded to pneumonectomy. A right pneumonectomy was performed by an open thoracotomy approach. The procedure was well tolerated and she was discharged without complication. On follow-up she has stopped all pain medications, is no longer using supplementary oxygen and now attending college.

**Conclusions:**

Chest pain is observed in cases with sequestrations and congenital absence of a pulmonary artery with a hypoplastic lung. The pain often resolves with resection. The mechanism by which this occurs is not clear. In this case bronchiectasis and haemoptysis were also of concern and in this case she has experienced an improvement in pulmonary performance which may be related to pain optimization or surgical management of bronchiectasis.

**Disclosure:** No significant relationships.

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**EARLY-ONSET OF PLATYPNEA - ORTHODEOXIA SYNDROME AFTER RIGHT INTRAPERICARDIAL TRACHEOPLASTIC PNEUMONECTOMY**

C. Foroulis<sup>1</sup>, Athanasios Kleontas<sup>1</sup>, G. Tagarakis<sup>1</sup>, V. Grosomanidis<sup>2</sup>, S. Hadjimiltiadis<sup>3</sup>, P. Tossios<sup>1</sup>, K. Anastasiadis<sup>1</sup>

<sup>1</sup>*Cardiothoracic Surgery, Aristotle University of Thessaloniki, Thessaloniki, Greece*

<sup>2</sup>*Anesthesiology and Intensive Care, Aristotle University of Thessaloniki, Thessaloniki, Greece*

<sup>3</sup>*Cardiology, Aristotle University of Thessaloniki, Thessaloniki, Greece*

**Objectives:**

Platypnea-orthodeoxia syndrome is a rare complication of right pneumonectomy which is attributed to interatrial right-to-left shunt through a patent foramen ovale (PFO) due to mediastinal shifting that causes anatomical changes in the caval orifices/axis and in the interatrial septum. The rare case of platypnea-orthodeoxia syndrome that became clinically evident on the 1<sup>st</sup> postoperative day after right pneumonectomy is reported.

**Case description:**

A 51-year old man underwent right intrapericardial tracheoplastic pneumonectomy for a squamous cell carcinoma of the right main bronchus invading the right tracheobronchial angle. Severe symptomatic oxygen desaturation (SpO<sub>2</sub>: 75-83%) occurred on the 1<sup>st</sup> postoperative day, since the first attempt of the patient to stand-up, while oxygen saturation returned gradually to normal (SpO<sub>2</sub>: 95-99%) in the supine position. The suspicion of right-to-left shunt through a PFO was confirmed by trans-esophageal echocardiography (TEE). The patient underwent successful treatment of the syndrome via insertion of a 30mm PFO occluder device in the cardiac catheterization laboratory. Pulmonary hypertension was not detected by either TEE or during right heart catheterization. Immediately after PFO closure and complete interruption of the right-to-left shunting, oxygen saturation returned to normal levels in any body position. The patient had an otherwise uncomplicated postoperative course.

**Conclusions:**

Early occurrence of platypnea – orthodeoxia syndrome is a very rare complication of right pneumonectomy which can be attributed to the existence of PFO and to the extensive dissection of mediastinal structures that is mandatory to perform a right tracheoplastic pneumonectomy. Clinical suspicion of the syndrome, detection of interatrial shunting through TEE and closure of the PFO via percutaneous insertion of a PFO occluder device resolves the syndrome and normalizes the postoperative course.

**Disclosure:** No significant relationships.

P-238

**SURGICAL TREATMENT OF INTIMAL SARCOMA OF THE PULMONARY ARTERY**Arthur Kostron<sup>1</sup>, I. Inci<sup>1</sup>, S. Mussot<sup>2</sup>, P. Dartevelle<sup>2</sup>, W. Weder<sup>1</sup>, I. Opitz<sup>1</sup><sup>1</sup>*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*<sup>2</sup>*Department of Thoracic and Vascular Surgery, Centre Chirurgical Marie Lannelongue, Le Plessis Robinson, France***Objectives:**

To demonstrate the difficulties of diagnosis and treatment of intimal sarcoma of the pulmonary artery, a very rare neoplasm with poor prognosis that is frequently mistaken for pulmonary embolism (PE) or chronic thromboembolic pulmonary hypertension (CTEPH). In contrast to angiosarcoma, only a few cases of intima sarcomas of the pulmonary artery are reported.

**Case description:**

A 53 year old female presented with a two months history of dyspnea (NYHA II to III) and chest pain. A chest CT showed complete obstruction of the main right pulmonary artery (Figure 1A). Oral anticoagulation was initiated for suspicion of PE. Because of atypical presentation, a heart MRI was performed and was highly suspicious for a pulmonary artery sarcoma of the right main artery. Right heart catheter guided cytology did not show malignancy; fine needle aspiration via EBUS, however, showed a non-small cellular malignancy. The patient was referred to us with suspicion of a sarcoma of the pulmonary artery, and a bilateral pulmonary endarterectomy (PEA) under circulatory arrest in deep hypothermia was performed. Histology revealed an intimal sarcoma of the right and left pulmonary artery (Figure 1B). The postoperative course was uneventful besides self-limiting mild dyskinesia and she was discharged at day 18. Adjuvant chemotherapy with Ifosfamid and Adriamycin is currently given.







**Conclusions:**

This case illustrates the importance of a bilateral surgical approach of both pulmonary arteries even in absence of pathological changes on images. PEA under deep hypothermia and circulatory arrest is the treatment of choice whenever possible because it may result in complete tumor removal and can provide excellent palliation even in the setting of an extensive disease, because it preserves pulmonary vascular bed and delays the ineluctable recurrence of pulmonary hypertension brought by neoplastic obstruction. A multidisciplinary treatment concept is indicated in rare tumors of the pulmonary artery for optimal outcome.

**Disclosure:** No significant relationships.

**P-239****ATYPICAL THYMIC CARCINOID PRODUCING ECTOPIC ACTH CAUSING CUSHING'S SYNDROME INITIALLY PRESENTING WITH SEVERE STEROID PSYCHOSIS**Thomas Osei-Agyemang*Thoracic Surgery, University Medical Center Freiburg, Freiburg, Germany***Objectives:**

Thymic carcinoid is a rare entity. We report a case initially presenting with steroid psychosis.

**Case description:**

A 21-year-old female was taken to the emergency department of a county hospital because of severe change in her character. Her relatives had noticed an alteration in her appearance and were in great anxiety because the otherwise cheerful and intelligent student was highly depressive and no longer able to do the easiest sums. Lab tests revealed severe hypopotassemia and she was admitted for further investigations. Plasma aldosterone-renin-ratio was normal and 24-hour-urine-collection confirmed elevated cortisol excretion. ACTH was exalted so suspicion of secondary hypercortisolism was raised and MR of the brain performed. With MR showing 4mm pituitary microadenomas diagnosis of Cushing's disease was assumed and the patient referred to the department of neurosurgery of our university medical center for resection. At admission she presented with signs of severe steroid psychosis inappropriate in relation to small microadenomas and therefore transferred to the endocrinology department. With diagnosis of ACTH dependent hypercortisolism confirmed high-dose dexamethasone-suppression-test was negative and corticotropine-releasing-hormone stimulation-test showed no regulation of ACTH- and cortisol-levels suggestive of ectopic Cushing's syndrome. Petrosal-venous-sinus-catheterization was performed with no central-to-peripheral plasma ACTH gradient so diagnosis of ectopic Cushing's syndrome was likely. Due to suicidal tendency despite treatment with haloperidol and metyrapone she had to be referred to ICU for intensified therapy. Having overcome psychotic crisis F18-FDG-PET-CT was performed and showed a small paracardial tumor with moderate hypermetabolism. The patient was referred to thoracic surgery department and we performed VATS-Thymectomy. ACTH-levels dropped below standard values after surgery. Histopathology confirmed an atypical thymic carcinoid with maximum diameter of 2.5cm. She was discharged day 8 after operation having recovered full intellectual capacity.

**Conclusions:**

Scrutinizing questions, strict indications and interdisciplinary collaboration has led to proper diagnosis in this case of a very rare thoracic surgical disease.

**Disclosure:** No significant relationships.



P-240

**PRETRACHEAL PARAGANGLIOMA: A RARE SURGICAL CHALLENGE**

Petra Roskopfova<sup>1</sup>, P. Tozzi<sup>2</sup>, J.Y. Perentes<sup>1</sup>, T. Krueger<sup>1</sup>, F. Gronchi<sup>3</sup>, H. Ris<sup>1</sup>,  
M. Gonzalez<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>2</sup>*Cardiac Surgery, University Hospital of Lausanne, Lausanne, Switzerland*

<sup>3</sup>*Anesthesiology, University Hospital of Lausanne, Lausanne, Switzerland*

**Objectives:**

Mediastinal paragangliomas are rare neuroendocrinal tumors arising from chromaffin tissue located in the para-aortic ganglia. They tend to invade bordering structures and have the potential of forming metastasis. Complete surgical resection remains the gold standard due to the malignant potential of the tumor and poor response to chemotherapy or radiation. We report a case of a 50-year old asymptomatic female who was referred for an incidental paraganglioma localized in front of the carina requiring an en bloc resection with the ascending aorta using cardio-pulmonary bypass.

**Case description:**

The patient presented a mass of 4 x 4 cm between the ascending aorta and the anterior aspect of the carina. Her past medical history was not relevant and the patient did not complain of any symptoms. PET-CT showed a relevant hypercaptation of the mass without distant suspect lesions. Mediastinoscopy revealed the diagnosis of paraganglioma. The tumor was resected through a median sternotomy and dissected from the trachea and the right pulmonary artery but the posterior wall of ascending aorta was macroscopically infiltrated. Cardio-pulmonary bypass was installed with central cannulation. En bloc resection was performed including the ascending aorta which was reconstructed by a Dacron graft. The duration of cardio-pulmonary bypass was 85 minutes. Postoperative course was uneventful. The pathological examination showed a completely resected paraganglioma with positivity for neuroendocrine markers synaptophysin and chromogranin, and sustentacular cells positive for S-100 protein. There is no evidence of recurrence at CT scan up to 7 months of follow-up.

**Conclusions:**

Paraganglioma should be considered in the differential diagnosis of a pretracheal mass. Complete surgical resection is mandatory but may require the use of cardio-pulmonary bypass due to the invasion of great vessels. Life-long surveillance is mandatory for early detection of local recurrence and metastatic spread.

**Disclosure:** No significant relationships.

P-241

**VANISHING PRIMARY LUNG CARCINOMA FOLLOWING IRRADIATION OF THE METASTASIS: THE ABCOPAL EFFECT**Akif Turna<sup>1</sup>, E. Hekimoglu<sup>1</sup>, A. Demirkaya<sup>2</sup>, K. Kaynak<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, Istanbul University, Cerrahpasa Medical Faculty, Istanbul, Turkey*<sup>2</sup>*Department of Thoracic Surgery, Acibadem University Atakent Hospital, Istanbul, Turkey***Objectives:**

A new phenomenon also known as abscopal effect refers to a regression of metastatic lesions distant from the primary site of radiotherapy. Localized radiotherapy has been shown to induce abscopal effect in several types of cancer, including melanoma, lymphoma, and renal-cell carcinoma. However, clinical reports of abscopal effect in non-small-cell lung carcinoma are extremely rare.

**Case description:**

Sixty eight year old male patient was admitted to our clinic with dyspnea. Chest CT revealed a 8 mm lesion located at superior segment of lower lobe in the right lung. Transthoracic fine needle aspiration revealed squamous cell carcinoma. Cranial MR disclosed a pons metastasis. The patient had cranial radiotherapy. A mediastinoscopy was performed and it revealed no N2 disease. Second PET-CT suggested the disappearance of right lower lob nodule (i.e., no nodule and no radioactive fluorodeoxyglucose uptake). Revision of the evaluation of the lung nodule confirmed squamous cell pathology. Six months later, new chest CT showed right lower lobe nodule at a size of 1 cm. PET imaging also showed slightly increased radioactive fluorodeoxyglucose uptake of the lesion. We performed superior segmentectomy of the right lower lobe and lymph node dissection. The specimen was reported as adenocarcinoma with a predominant lepidic pattern. He has been recurrence-free during a 19-months follow-up.

**Conclusions:**

Regression of tumor cells after the radiation of a distant metastatic site is called Abscopal effect suggesting stimulation of anti-tumor immunity by irradiation of tumor cells. The phenomenon should be considered in lung cancer patients with metastasis who had irradiation for metastatic tumor.

**Disclosure:** No significant relationships.

**TUESDAY, 2 JUNE 2015****07:30 - 23:00****DISPLAY POSTERS****P-242****PATIENTS WITH RESECTABLE STAGE IIIA NON-SMALL CELL LUNG CANCER IN WHOM N2 DISEASE IS DETECTED AT PREOPERATIVE INVASIVE STAGING OF THE MEDIASTINUM EXHIBIT BETTER SURVIVAL COMPARED TO PATIENTS WITH N2 DISEASE DISCOVERED INTRAOPERATIVELY**

Massimo Castiglioni<sup>1</sup>, R. Aye<sup>2</sup>, J. Gorden<sup>2</sup>, B. Louie<sup>2</sup>, A. Farivar<sup>2</sup>, E. Vallières<sup>2</sup>

<sup>1</sup>*Center for Thoracic Surgery, University of Insubria, Varese, Italy*

<sup>2</sup>*Thoracic Surgery, Swedish Cancer Institute, Seattle, United States of America*

**Objectives:**

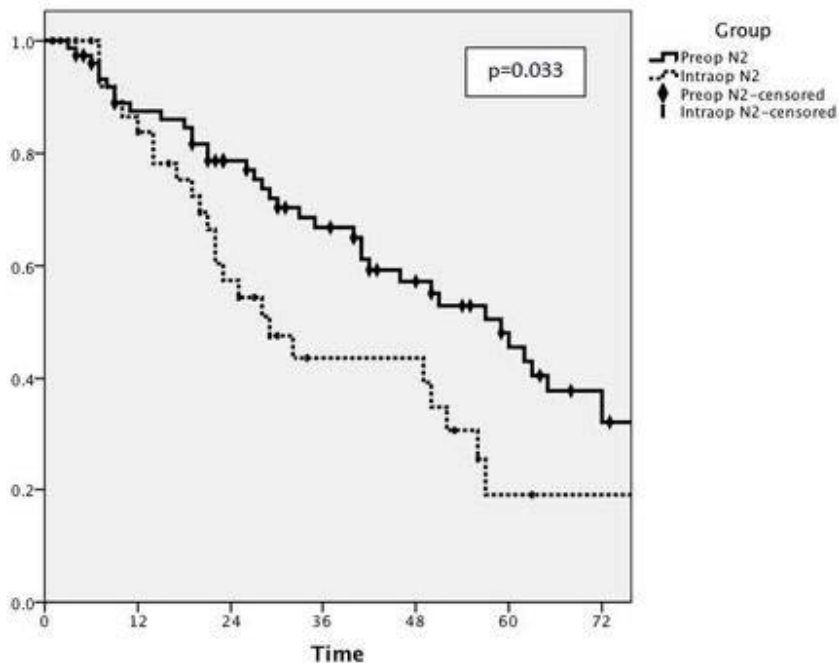
Approximately 10% of patients with NSCLC present with stage IIIA (N2) disease. This forms the most surgically challenging and controversial subset of lung cancer patients, with 5-year survival of 3% to 47%. The influential study of the past era was that of Pearson who in 1982 published that resection in mediastinoscopy-positive patients was associated with 5-year survival of only 9%, vs 24% in mediastinoscopy-negative but thoracotomy N2 positive patients. Over the last three decades, several changes have occurred in the way by which stage IIIA (N2) is diagnosed and treated. We sought to compare the modern era survival rates between patients with N2 disease detected preoperatively vs intraoperatively.

**Methods:**

A retrospective review of patients with pathologic stage IIIA (N2) who underwent definitive surgery between 2000 and 2012. They were divided in two groups: group 1(G1)=76 patients with positive N2 nodes identified preoperatively, group 2(G2)=44 patients with negative nodes at preoperative invasive staging but found to have N2 disease at resection.

## Results:

Figure 1. Overall survival between two groups of patients.



	G1 (76 patients)	G2 (44 patients)	<i>p</i>
Age, year, median	62	65	0.04
Male/Female ratio, No.	38/38	26/18	0.34
PET, No. (%)	73 (96)	40 (91)	0.45
Mediastinoscopy, No. (%)	62 (82)	40 (91)	0.17
EBUS, No. (%)	12 (16)	4 (9)	0.30

Curative resection was performed in 97% (74/76) of patients in G1 and 93% (41/44) in G2 ( $p=0.53$ ). Induction therapy was administered in 87% (66/76) in G1 and 7% (3/44) in G2 ( $p<0.0001$ ). Adjuvant therapy was administered in 54% (41/76) in G1 and 70% (31/44) in G2 ( $p=0.07$ ). Altogether, 97% (74/76) in G1 and 75% (33/44) in G2 received systemic therapy. 5-year cancer-specific survival was 45.6% in G1 and 19.1% in G2 ( $p=0.04$ ).



**Conclusion:**

Survival with N2 disease detected preoperatively was significantly better than reported in the past era whereas it was unchanged for intraoperative detection. This may reflect better patient selection as a result of improved staging with CT-PET. Also, the better use of enhanced perioperative systemic therapy might be a major factor. This finding supports a continued aggressive approach including induction therapy for highly selected patients found preoperatively to have N2 disease. As well, it raises once again the question of how to best manage patients with N2 disease found intraoperatively.

**Disclosure:** No significant relationships.

**P-243****IS SINGLE CHEST TUBE APPROPRIATE FOR PATIENTS UNDERGOING LOBECTOMY AFTER NEOADJUVANT TREATMENT?**

H. Melek, A.S. Bayram, M.M. Erol, G. Cetinkaya, Cengiz Gebitekin  
*Thoracic Surgery, Uludag University Faculty of Medicine, Bursa, Turkey*

**Objectives:**

The use of two chest tubes after lobectomy is a common practice but using single chest tube has been reported in a few randomized studies. However, there have been no reports about single chest tube for patients who underwent lobectomy after neoadjuvant treatment. The present retrospective study aims to investigate the results of single chest tube management of the pleural cavity in patients undergoing lobectomy after neoadjuvant treatment.

**Methods:**

The data was prospectively recorded and retrospectively reviewed that consisted of 145 patients undergoing lobectomy in two years period (January 2013 and December 2014). Twenty patients (13.8%) were excluded from the study due to placement of two chest tubes. Therefore, 125 patients treated with single chest tubes were enrolled into study. The patients were divided into two groups, the first group (n=71pts) consisted of patients undergoing lobectomy without neoadjuvant treatment while the second group (n=54pts) included patients who had lobectomy after having neoadjuvant treatment. The duration and amount of drainage, complications, insertion of an additional drain were compared between the groups.

**Results:**

Neoadjuvant setting was chemotherapy in 43(80%) and chemoradiotherapy in 11(20%) preoperatively. Prolonged air leak was the most common pulmonary complication (21%) that was observed in 17% of the patients in Group 1 and 26% in Group 2. The second chest tube was inserted in 16 patients (group 1; 7% (5/71), group 2; 20% (11/54), p=0,03. We found no difference between groups comparing prolonged air leak and space development; however, group 2 experienced more pleural effusion and insertion of 2<sup>nd</sup> chest tube (p=0,01).

**Conclusion:**

Although, placement of single chest tube after lobectomy without neoadjuvant treatment is an effective method, we do recommend using two tubes in patients undergoing lobectomy after neoadjuvant treatment due to excessive pleural effusion and necessity of second chest tube in the postoperative period.

**Disclosure:** No significant relationships.





P-244

**COMPLETION PNEUMONECTOMY ON 99 PATIENTS: ANALYSIS OF FACTORS AFFECTING EARLY AND LONG TERM RESULTS.**Florence De Dominicis<sup>1</sup>, P. Berna<sup>1</sup>, J. Iquille<sup>1</sup>, A. Fourdrain<sup>1</sup>, G. Merlusca<sup>1</sup>, M. Riquet<sup>2</sup><sup>1</sup>Thoracic Surgery, Amiens University Hospital, Amiens, France<sup>2</sup>Thoracic Surgery, Hôpital Européen Georges Pompidou, Paris, France**Objectives:**

Completion pneumonectomy (CP) is a major procedure known to have a high morbidity and mortality, but often it offers the last chance to cure the patient. The aim of our study is to evaluate the factors influencing the post-operatives and the long-term survival after completion pneumonectomy.

**Methods:**

We retrospectively reviewed the records of the 99 patients who underwent a completion pneumonectomy in the thoracic surgery department of the European Georges Pompidou Hospital and of the University hospital of Amiens between 1980 and 2013.

**Results:**

The surgery was on the right side for 49 patients. The indication for the first surgery was benign diseases (BD) in 11 cases and malignant disease (MD) in 88 cases. Average time between the first surgery and CP was 72.9 months. There were 76 CP for MD, including 70 NSCLC and 23 for BD including eight emergency. Global morbidity was 51.5% (46% for the MD and 69.6% for the BD,  $p=0.021$ ). There were 22 reoperations (17.1% in the MD group and 39.1% in the BD group,  $p=0.033$ ) with significantly more reoperations on the right side (30.6% vs 14%,  $p=0.038$ ). 77.8% of fistulas occurred after CP on the right side ( $p=0.091$ ). Mortality at 90 days was 17.2% (13.2% for the MD and 30.4% for the BD,  $p=0.028$ ). For the CP performed in emergency, post-operatives mortality was 50% ( $p=0.089$ ). The overall actuarial 5-year survival was 31.3%. The long-term survival increased significantly with the interval between the first surgery and the CP ( $p=0.025$ ). The stage seems also to influence long-term survival (stage I vs Stage III;  $p=0.055$ ).

**Conclusion:**

Completion pneumonectomy for benign disease is a risky intervention, especially when performed in emergency. Morbidity and mortality after CP for cancer remains acceptable, but long-terms results are better if the stage is lower and the interval between surgeries longer.

**Disclosure:** No significant relationships.

P-245

**DISCREPANCY BETWEEN CLINICAL AND PATHOLOGICAL TNM STAGE IN PATIENTS WITH NON-SMALL CELL LUNG CANCER AND THE LONG-TERM SURVIVAL**

Martijn Ten Berge<sup>1</sup>, D.J. Heineman<sup>2</sup>, W.H. Schreurs<sup>2</sup>, M. Wouters<sup>3</sup>

<sup>1</sup>*Surgery, Leiden University Medical Center, Leiden, The Netherlands*

<sup>2</sup>*Surgery, Medisch Centrum Alkmaar, Alkmaar, The Netherlands*

<sup>3</sup>*Surgery, NKI-AvL, Amsterdam, The Netherlands*

**Objectives:**

Clinical staging in patients with non-small cell lung cancer (NSCLC) is an essential step in the choice of right treatment. Pulmonary surgery remains, next to systemic and radiotherapy treatment, important for the treatment of NSCLC. To determine the patients eligible for surgery a reliable clinical TNM stage is mandatory. In a study by Jacobsen et al described an improvement of the TNM discrepancy from 33% to 91.3% in patients who had an anatomical resection, although the survival benefit has not been investigated. The objective of this study is to determine the discrepancy between clinical and pathological TNM stage in patients with NSCLC and the consequences for the long-term survival.

**Methods:**

A retrospective analysis of patients with a NSCLC (stage IA-IV) who underwent surgery in the period 2008-2010 with follow-up time of three years. Data was obtained from the nation-wide Dutch Cancer Registry and log rank test and cox regression analysis were used for analysis.

**Results:**

A total of 2670 patients were included and 14.2% (n=380) had an overstaged cTNM and 26.6% (n=711) understaged cTNM. In 401 patients the understaged cTNM was due to an underestimated N stage. The 36 months survival in the non-discrepancy group is 71%, for the overstaged group 63% and understaged group 59% (p < 0.05) (fig 1). Additionally the overstaged group has a HR of 0.79 with 95% confidence interval (95% CI) [0.59-1.054] and the understaged group a HR of 1.9 with a 95%CI [1.62-2.28] after correction for patient and tumor characteristics and tumor stage.

**Conclusion:**

Patients with understaged cTNM have worse long-term survival compared to patients with no discrepancy between clinical and pathological TNM stage. More information about the staging process in the discrepancy group is necessary to determine where improvements can be made.

**Disclosure:** No significant relationships.



P-246

**SENTINEL NODE IDENTIFICATION DURING SEGMENTECTOMY USING INDOCYANINE GREEN FLUORESCENCE IMAGING FOR cT1N0M0 NON-SMALL CELL LUNG CANCER**

Hiroaki Nomori, Y. Cong, H. Sugimura

*Thoracic Surgery, Kameda Medical Center, Kamogawa, Japan*

**Objectives:**

To examine the utility of sentinel node (SN) identification using indocyanine green (ICG) during segmentectomy in patients with cT1N0M0 non-small cell lung cancer (NSCLC).

**Methods:**

ICG was injected around the tumor after thoracotomy followed by segmentectomy and lymph node dissection in 104 patients with cT1N0M0 NSCLC. Dissected nodes were examined using an ICG fluorescence imaging system. Fluorescent nodes were identified as SNs and examined by intraoperative frozen sections and postoperative immunohistochemical staining.

**Results:**

SNs could be identified in 85 patients (82%). Mean number of SN stations was  $2.2 \pm 1.3$ . Percentages of being an SN were 65% for station #12 and 57% for #13, significantly higher than the 17% for #10 and 24% for #11 ( $p < 0.001$ ). Nine patients had N1 or N2 disease. Of these, SNs were true-positive (i.e., contained metastasis) in 6 patients (67%) and false-negative (i.e., SNs did not contain metastasis, while non-SNs contained metastasis) in 3 (33%). Of the 3 patients with false-negative results, all non-SNs containing metastases were at station #12 or #13.

**Conclusion:**

While ICG is useful to identify SNs during segmentectomy for cT1N0M0 NSCLC, stations #12 and #13 should be submitted for frozen sections along with identified SNs to avoid missing true SNs.

**Disclosure:** No significant relationships.

P-247

**THE USE OF THORACIC MORBIDITY AND MORTALITY SYSTEM FOR THE ANALYSIS OF PNEUMONECTOMY OUTCOME IN NON-SMALL CELL LUNG CANCER PATIENTS: ARE EXTENDED RESECTIONS WORTHWHILE?**

Oleg Pikin<sup>1</sup>, A. Ryabov<sup>2</sup>, V. Glushko<sup>1</sup>, K. Kolbanov<sup>1</sup>, A. Amiraliev<sup>1</sup>, V. Barmin<sup>1</sup>, V. Bagrov<sup>1</sup>, Z. Tukvadze<sup>1</sup>

<sup>1</sup>Thoracic Surgery, Moscow Hertzen Research Institute of Oncology, Moscow, Russian Federation

<sup>2</sup>Thoraco-abdominal Surgery, Moscow Hertzen Research Institute of Oncology, Moscow, Russian Federation

**Objectives:**

Postoperative complications after pneumonectomy for NSCLC depend on the extension of surgery, comorbidities and accurate registration of any adverse event. The aim of the study was to evaluate the short-term results after standard and extended pneumonectomy in NSCLC patients according to the Thoracic Morbidity and Mortality (TMM) grading system.

**Methods:**

We included 216 NSCLC patients consecutively submitted to pneumonectomy at our institution from January 2009 to December 2013 in the retrospective study performed on data prospectively collected in an electronic clinical database. All patients were divided into two different groups: standard (n=142) and extended (n=74) pneumonectomy, where resection of adjacent organs was indicated. The patients undergone extended pneumonectomy were subdivided into single (n=49) and multi-organ resection (n=25) groups. Systemic mediastinal lymph node dissection was carried out in all cases. Morbidity and mortality rate was analyzed according to the definitions proposed by the ESTS and TMM classification system.

**Results:**

Postoperative morbidity and mortality rate after standard pneumonectomy (23,9% and 3,5%) was significantly lower than extended procedure (43,2% and 10,8%) (p=0.02). Multi-organ resection was an independent prognostic factor of unfavourable outcome: morbidity and mortality was significantly higher in the multi-organ group (48,0% and 16,0%), while in the single-organ group it was 40,8% and 8,2% respectively (p=0.01). The incidence of the BPF was the only one variable in the ESTS complications definition which differs significantly between the groups of standard, single- and multi-organ resection: 3,5%, 6,1% and 16,0% respectively (p=0.02). Major complications rate (grade IIIA and higher according to the TMM) was significantly higher in the multi-organ group (40,0%) than in the single-organ (28,6%) and standard (14,8%) group (p=0.01).

**Conclusion:**

TMM classification system is more accurate in grading and further analysis of postoperative complications after pneumonectomy in NSCLC patients in compare with ESTS criteria. Multi-organ resection should be carried out with caution due to unacceptable high morbidity and mortality rate.

**Disclosure:** No significant relationships.



P-248

**THE RISK FACTOR OF LOCAL RECURRENCE AT THE SURGICAL MARGIN IN PULMONARY WEDGE RESECTION**Satoshi Shiono<sup>1</sup>, M. Katahira<sup>1</sup>, M. Abiko<sup>1</sup>, N. Yanagawa<sup>2</sup><sup>1</sup>*Thoracic Surgery, Yamagata Prefectural Central Hospital, Yamagata, Japan*<sup>2</sup>*Pathology, Yamagata Prefectural Central Hospital, Yamagata, Japan***Objectives:**

Local recurrence at the surgical margin is a problem with wedge resections. Previously, aerogenous spread with floating cancer cell clusters were significantly related with local recurrence of the surgical margin in pulmonary metastasectomy (Shiono, Ann Thorac Surg 2005). To prevent local recurrence, we routinely perform exploration of the surgical margin and lavage cytology of the surgical margin during surgery. In this study, we prospectively collected the data, and investigated the risk factors of local recurrences at the surgical margin in pulmonary wedge resection cases.

**Methods:**

From May 2004 to July 2014, a total of 108 patients underwent pulmonary wedge resection and lavage stump cytology. For these patients, clinical and pathologic factors were reviewed, and the risk of a local recurrence at the surgical margin was investigated.

**Results:**

All cases were complete resection. 48 were lung cancer patients and 60 were metastatic lung tumors. In the results of stump lavage cytology, there were 4 positive, 4 suspicious, and 4 negative cases. After wedge resection, 6 of the 108 patients (5.6%) developed local recurrences at the surgical margin. Among positive or suspicious cases in lavage stump cytology, there was no patient who developed local recurrence. Five-year overall survival was 67.4% and 5-year local recurrence-free survival was 90.5%. Univariate analysis revealed that the distance of the surgical margin ( $p = 0.01$ ) and aerogenous spread with floating cancer cell clusters ( $p < 0.01$ ) were a significantly related with local recurrence at the surgical margin. Multivariate analysis confirmed aerogenous spread with floating cancer cell clusters was a significant risk factor for local recurrence.

**Conclusion:**

Our prospectively collected data showed that aerogenous spread with floating cancer cell clusters is significantly related with higher risk of local recurrence at the surgical margin. We could not show the benefit of lavage stump cytology in pulmonary wedge resection.

**Disclosure:** No significant relationships.

P-249

**ARE THERE RELATIONS BETWEEN PREOPERATIVE DIABETES AND POSTOPERATIVE INFECTIONS IN RESECTED LUNG CANCER PATIENTS?**

Shunki Hirayama, K. Takamochi, S. Oh, K. Suzuki

*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

The diabetes mellitus is known to be associated with postoperative complications. There are few reports regarding the association with thoracic surgery. The purpose of the present study is to clarify the relationship between diabetes and postoperative morbidity and mortality. Moreover we evaluated the risk factor of postoperative infection in patients with lung cancer with diabetes mellitus.

**Methods:**

Between January 2009 and December 2013, 1246 patients with non-small cell lung cancer underwent surgery at the Juntendo University Tokyo, Japan. We excluded the patients who underwent induction therapy. We defined the 169 patients who diagnosed with diabetes and have treatment history as the diabetic group. We investigated clinic-pathological features, the risk factors of postoperative complications and postoperative infection of diabetic group.

**Results:**

In diabetes group, the median age was 70 years old (range, 44-90 years), 120 cases (71%) were male, and the median preoperative HbA1c level was 6.9% (range, 4.9-9.7%). The patients with diabetes group had more males (71%), smoking history (72%), pulmonary fibrosis (10%) and history of heart disease (31%) than the patients in non-diabetes group. The morbidity rate of the atelectasis (7%), pneumonia (6%), empyema (2%) and postoperative infections (10%) in diabetes group was significantly more than that in non-diabetes group (( $p = 0.01$ ,  $p = 0.01$ ,  $p = 0.08$  and  $p < 0.01$ ). There was no significant difference that the correlation between the 90-days mortality and postoperative infections in the diabetes group ( $p = 0.274$ ). The bleeding more than 500ml was a risk factor of postoperative infection in univariate and multivariate analysis ( $p < 0.01$  and  $p < 0.01$ ).

**Conclusion:**

Although postoperative infection incidence of lung cancer patients with diabetes mellitus was higher than the patients without diabetes mellitus, there was no correlation in surgery-related death. An independent risk factor for postoperative infection was intraoperative bleeding.

**Disclosure:** No significant relationships.



P-250

**OVERALL TRENDS IN LUNG CANCER DIFFER FROM TRENDS AMONG SURGICALLY TREATED LUNG CANCERS**Tanel Laisaar<sup>1</sup>, M. Mägi<sup>2</sup>, B. Sarana<sup>1</sup>, P. Kibur<sup>1</sup>, T.R. Kibur<sup>1</sup>, M. Raag<sup>3</sup>, K. Laisaar<sup>3</sup><sup>1</sup>*Thoracic Surgery, Tartu University Hospital, Tartu, Estonia*<sup>2</sup>*Estonian Cancer Registry, National Institute for Health Development, Tallinn, Estonia*<sup>3</sup>*Public Health, Tartu University, Tartu, Estonia***Objectives:**

Lung cancer incidence has been decreasing in most countries during last decade. However, the incidence of adenocarcinoma has been increasing, and lung cancer is being more often diagnosed among women. The aim of the current study was to compare lung cancer epidemiology among surgically treated and other patients.

**Methods:**

All lung cancer patients diagnosed in Estonia and reported to National Cancer Registry during 1995 to 2011 were included into the study. Characteristics of surgically treated patients were compared to other patients. Trends in proportions were tested by chi-squared test; difference in trends in incidence proportions were tested by Poisson regression; trends in means were analysed by linear regression.

**Results:**

Altogether 13,009 lung cancer patients (10,386 male and 2,623 female; mean age 66.7 years) were registered. While the overall incidence of lung cancer has not changed over the years, it has been increasing among women and decreasing among men. Also the age of patients, the incidence of adenocarcinoma, and the number of patients treated surgically has increased during the study years. Proportion of patients treated surgically increased more rapidly among female than male patients (4% per year faster;  $p = 0.0008$ ). When comparing surgically treated patients to other (non-surgical) patients, a more rapid increase of proportion of adenocarcinoma patients (7% faster per year compared to other patients;  $p < 0.0001$ ) and an increase in the proportion of female patients (from 11% to 22%,  $p = 0.0008$ ) were detected. Although in general surgically treated patients were younger than others, their age increased over the study years (0.3 years per year;  $p < 0.0001$ ), similarly to non-surgical patients.

**Conclusion:**

During past 17 years the increasing trends of adenocarcinoma incidence and proportion of females among lung cancer patients have been more pronounced among surgically treated patients compared to all other lung cancer patients.

**Disclosure:** No significant relationships.

P-251

**MANAGEMENT OF THORACIC TRAUMA AND ANALYSIS OF RISK FACTORS FOR OUTCOME**

Morris Beshay<sup>1</sup>, H.W. Kotkamp<sup>2</sup>, F. Mertzlufft<sup>3</sup>, D. Branscheid<sup>1</sup>

<sup>1</sup>General Thoracic Surgery, Evangelical Hospital Bielefeld, Bielefeld, Germany

<sup>2</sup>Division of A&E, Evangelical Hospital Bielefeld, Bielefeld, Germany

<sup>3</sup>Department of Anaesthesia and Intensive Care, Evangelical Hospital Bielefeld, Bielefeld, Germany

**Objectives:**

Thoracic trauma is one of the most common injuries. Its management is a very challenging task and continues to evolve and improve. The purpose of this study is to analyze the risk factors in a high volume trauma center with special attention to the outcome.

**Methods:**

Between January 2003 to December 2012 data of all patients were prospectively collected and registered at the German Trauma Registry (GTR) thereafter retrospectively analyzed. Type of injury, injury severity score (ISS), abbreviated injury scale (AIS), shock room procedures, operative procedures, complications, the use of organ replacement procedures, time of hospital stay, overall survival were analyzed. Patients were divided into two groups; group I included patients between January 2003 to December 2007, Group II in a prior between Jan. 2008-Dec. 2012.

**Results:**

630 patients (56%) had thoracic trauma. 540 (48%) had associated extra thoracic injuries. Group I: 285 patients (197 male, mean age 46 years). Group II: 345 (251 male, mean age 49 year). No statistical difference was identified between patients in both groups in form of sex, type of thoracic injury, or accompanied injuries of other organs. 90 days mortality was higher in group I ( $p=0.024$ ). Complication rates were higher in group I ( $p=0.019$ ). Higher severity of ISS score and AIS thoracic showed higher rate of mortality ( $p<0.0001$ ). Young patients were frequently exposed to severe thoracic injury but showed less mortality ( $p=0.014$ ). Patients with severe lung contusions had higher mortality ( $p<0.001$ ). 23 (8%) Patients had emergency thoracotomy in group I vs. 14 patients (4%) in group II ( $p=0.041$ ). Higher use of VATS in group II ( $p<0.001$ ).

**Conclusion:**

Thoracic trauma is often under calculated. Better survival rates is achievable in specialized center with a multidisciplinary teamwork in the presence of thoracic surgeon. Severe lung contusion, higher ISS and AIS thoracic and age are independent prognostic factors affecting outcome.

**Disclosure:** No significant relationships.



P-252

## PROGNOSTIC FACTORS FOR COMPLICATIONS IN SURGERY OF INFECTIOUS LUNG CAVITIES

Gildardo Cortes<sup>1</sup>, J.M. Mier<sup>2</sup>, L.C. Valencia Garcia<sup>1</sup>, M.A. De La Rosa Abaroa<sup>1</sup>, V. Zotes<sup>2</sup>, E. Guzman<sup>2</sup>

<sup>1</sup>*Surgery, National Institute of Respiratory Diseases, Mexico City, Mexico*

<sup>2</sup>*Thoracic Surgery, National Institute of Respiratory Diseases, Mexico City, Mexico*

### Objectives:

The resection of infectious lung cavities is the best treatment for the cases not amenable to medical treatment. The objective of this study is to show clinical risk factors that are associated to post-operative complications.

### Methods:

A **cohort nested case-control study** of patients operated from 2000 to 2014 was performed. The **case group** included complicated patients and the **control group** contained the uncomplicated cases. **Complication** was defined as any of the following present into the 90 days after the surgery: death, recurrence of hemoptysis or infection, operative bleeding > 500ml, vascular lesion, massive transfusion or re-intervention for bleeding, post operative mechanical ventilation, ICU stay > 5 days and postoperative empyema. The next possible risk factors were evaluated: demography, exposition to contaminants, comorbidities (including tuberculosis exposure) preoperative embolization, surgery indication, spirometry results, laboratory results and smear test for *M. tuberculosis*. The XLSTAT 2014 MacIOS statistic package was employed for the analysis. Odds Ratio was calculated for proposed risk factors.

### Results:

Fifty-four patients with infectious cavities were attended in the period, of which 45 patients were operated, 21 represented the control group and 24 composed the case group. The 90-day mortality was zero. The prevalence of any type of complications was of 53% and the main complication was trans-operative or post-operative bleeding in 37%. **There was not any risk factor with statistical significance (table 1)**, but the presence of recurrent infection as indication for surgery was marginally significant ( $p=0.09$ ).

PROPOSED RISK FACTORS			
	CASES (COMPLICATED)	CONTROLS (UNCOMPLICATED)	STATICS
Number	24	21	
Age	$\mu$ 47.9 y	$\mu$ 48.9 y	P=0.83
BMI	$\mu$ 24.5 kg/m <sup>2</sup>	$\mu$ 25.1 kg/m <sup>2</sup>	P=0.67
Sex H: M	$\mu$ 13:11	$\mu$ 12:9	P=0.74
Selected chemistry and physiology lab values			
Hemoglobin	$\mu$ 12.6 mg/dl	$\mu$ 13.1 mg/dl	P=0.35
PT	$\mu$ 12.8 seg	$\mu$ 13.2 seg	P=0.30
p TT	$\mu$ 29.6 seg	$\mu$ 29.2 seg	P=0.65
Glucose	$\mu$ 145.4 mg/dl	$\mu$ 151.2 mg/dl	P=0.80
Creatinine	$\mu$ 0.83 mg/dl	$\mu$ 0.81 mg/dl	P=0.87
Albumin	$\mu$ 3.7 mg/dl	$\mu$ 3.9 mg/dl	P=0.38
FEV1	$\mu$ 2.3 l	$\mu$ 2.7 l	P=0.17
Hospitalization time	$\mu$ 17.6 d	$\mu$ 13.7 d	P=0.27 (Wilcoxon)
Overcrowding	7	6	OR=1.02 CI95% 0.2-3.7 P=0.96
Animals coexistence	13	7	OR=2.36 CI95% 0.7-7.9 P=0.16
COMBE	4	7	OR=0.4 CI95% 0.09-1.3 P=0.2
Inhaled solvents	3	0	OR=7 CI95% 0.3-143 P=0.2
Alcohol consumption	11	5	OR=2.7 CI95% 0.74-9.7 P=0.12
Tobacco consumption	14	6	OR=2.5 CI95% 0.72-2.6 P=0.14
Drugs consumption	4	0	OR=9.4 CI95% 0.47-186 P=0.14
Previous thoracic surgery	8	4	OR=2.12 CI95% 0.53-8.4 P=0.28
Embolization by catheterism	3	3	OR= 0.085 CI95% 0.15-4.7 P=0.06
Lung tuberculosis history	9	5	OR= 1.9 CI95% 0.52-7.04 P=0.32
Positive M. tuberculosis smear test	3	0	OR= 7 CI95% 0.34-143 P=0.20
Previous bronchoscopy	13	10	OR= 1.3 CI95% 0.40-4.2 P= 0.66
Positive pre-surgery microorganism isolation	9	6	OR= 1.5 CI95% 0.42-5.2 P= 0.52
Pre op. diagnosis of aspergillous vs "in study" cavitary lesion	15/9	10/11	OR=1.8 CI95% 0.55-6.2 P= 0.31
Persistent infection as indication for surgery	6	1	OR= 6.6 CI95% 0.7-60 P= 0.09
Hemoptysis minor o major as indication for surgery	16	15	OR= 0.8 CI95% 0.2-2.8 P=0.73
Hemoptysis major	3	1	OR=2.8 CI95% 0.27-29 P=0.38



**Conclusion:**

The resective surgery is a good treatment for medically difficult to treat lung infectious cavities, with a low mortality reported. The morbidity is elevated mainly for the presence of bleeding and vascular accidents. It is possible that the cases with recurrent infection presented more complications.

**Disclosure:** No significant relationships.

P-253

**THE AVAILABILITY OF INDIRECT HEMAGGLUTINATION TESTS FOR DIAGNOSING PULMONARY HYDATID CYSTS**B. Altuntas<sup>1</sup>, Y. Aydin<sup>1</sup>, A. Kaya<sup>2</sup>, Atilla Eroglu<sup>1</sup><sup>1</sup>*Department of Thoracic Surgery, Ataturk University, Medical Faculty, Erzurum, Turkey*<sup>2</sup>*Department of Family Medicine, Ataturk University, Medical Faculty, Erzurum, Turkey***Objectives:**

In this study, we researched the availability of indirect hemagglutination test in pulmonary hydatid cyst.

**Methods:**

Between January 2008 and December 2014, successive 60 cases that were studied in preoperative indirect hemagglutination test and histopathologically found to have pulmonary hydatid cyst were retrospectively analysed. Age and sex of the cases, cyst's localization, number, size, spread to other organs outside the lungs, to be intact or ruptured were revised.

**Results:**

35 (58.3%) patients were female and 25 (41.7%) patients were male, the mean age was 29.9±20.0 (between 2-83 years). While in 32 (53.3%) of the cases, there was only lung cysts, in 26 (43.3%) cases there were lung and liver cysts, in one case there were lung, liver and pericardia cysts and in one case cysts were located in the lung and kidney. While lung cysts were single in 44 (73.3%), they were multiple in 16 (26.7%) cases. In 34 (56.7%) cases cysts were in right lung, in 16 (26.7%) cases were in left. Ten (16.6%) cases had cysts in both right and left lung. Mean diameter of pulmonary cysts was 6.1 cm (range from 2 to 12 cm). In 37 (61.7%) cases hydatid cysts were ruptured whereas in 23 (38.3%) cases the cysts were intact. While general indirect hemagglutination test was found to be positive in 36 (60%) of the cases, it was negative in 24 (40%) of the cases. There were 37 ruptured cases, and 32 (86.5%) of them were test positive; whereas the test was positive in only 4 (17.4%) of the 24 cases where cysts were intact ( $p<0.001$ ).

**Conclusion:**

Our study demonstrated that the most important factor that affects the positivity of indirect hemagglutination test is to be ruptured of the cysts. When we think about the ruptured cysts as a confusing case, indirect hemagglutination test can contribute to diagnosis.

**Disclosure:** No significant relationships.



P-254

**THORACOSCOPIC SURGERY IN URGENT TREATMENT OF CHEST TRAUMA**

Kirill Gestkov, O. Kuznetsova, B. Barsky

*Thoracic Surgery, Russian Medical Academy of Postgraduate Education, Moscow, Russian Federation*

**Objectives:**

The use of thoracoscopy in case of chest trauma remains a matter for discussion. The first thoracoscopic operations on wound were made in 1940-ies (J.Branco, 1946). In the last 70 years opportunities of surgery and anesthesiology have cardinally changed. Despite these facts, the basic surgical tactics in case of chest trauma remains the pleural drain.

**Methods:**

During 10 years (1994 - 2014) we performed prospective analysis of surgical treatment of 1022 patients with chest trauma.

**Results:**

Thoracoscopy is highly informative in the case of lungs wounds, pericardium, mediastinum, diaphragm. We haven't had a single case when thoracotomy was required to confirm the diagnosis during thoracoscopy. Lung wounds were revealed in 37.3 %, diaphragm - in 18.7 %, heart - in 9.4 %. Thoracoscopy allows achieving hemostasis in case of the wound of chest wall vessels, suturing a wound of lung, remove extraneous bodies, evacuating haemothorax. In 81.3 % of cases thoracoscopy being a final method of treatment. The conversion to thoracotomy was needed in 8.8%. The reasons for transition to thoracotomy were the wounds of heart – in 9.4 %, deep wounds of lung in 6.2 %, active bleeding in 9.4% of cases. This tactics reducing lethality by 4.7 %, decrease the complications by 2.9%, reduce duration of the pleural drain, reduce frequency of purulent complications decrease the stay of patients in ICU. Insignificant hydrothorax was diagnosed in 6.7 % of cases, purulence of trocar entries in 2.2 %. Lethality was 1.4%.

**Conclusion:**

Thoracoscopy allows solving all basic tasks of operation on chest wounds: to diagnose anatomic character of trauma, stop the bleeding and restore integrity of the injured parts. It can play a significant role in surgical treatment of a chest trauma, as it possesses the reliability and efficiency of thoracotomy, which in case of invasiveness can be compared with pleural drain.

**Disclosure:** No significant relationships.

P-255

**OCTOGENARIANS UNDERGOING THORACIC SURGERY – RETROSPECTIVE ANALYSIS OF SURVIVAL AND QUALITY OF LIFE**

W. Moersig, Andreas Hiebinger, O. Fischer, A. Zippelius, M.N. Wiese, M. Toffel, K. Furrer, M. Tamm, D. Lardinois

*Division of Thoracic Surgery, University Hospital Basel, Basel, Switzerland*

**Objectives:**

Surgery in octogenarians is performed with reasonable results. However, little is known about the quality of life. There are data indicating that elderly patients with lung cancer are less likely to undergo curative treatment simply due to their advanced age. The goal of this study was to retrospectively examine quality of life in the age group over 80. Only well analyzed data enable the surgeon to honestly recommend the best therapeutic option for the patients and give them orientation there expected quality of life to come.

**Methods:**

A retrospective analysis was performed on 149 consecutive patients with a mean age of 83.4 years (range 80 to 98 years) who underwent thoracic surgery. 79 patients were male (51,6%) and 74 patients female (49,4%). Between 2008 and 2014 88 patients underwent thoracotomy (59,1%), on 61 patients (40,9%) minimally invasive procedures were performed. Preoperative data, operative outcome and long-term survival were analyzed. Survival was also compared to the average life expectancy of the standard population. Furthermore, the EORTC questionnaire was used to evaluate the quality of life before and after the intervention.

**Results:**

Overall in-hospital mortality was 5,4%. Mean survival time at closing date for abstract submission was 2,6±0,4 yrs. 30-day-mortality was 5,4% (7,96% for open vs. 1,6% for minimally invasive surgery). Of the 89 surviving patients 68% returned their questionnaire. Global Health scores before and after surgery showed a not significant improvement in the entire study group (43,8 vs. 49,2). In the comparison of open vs. minimally invasive procedures the second group had a better performance in QoL comparison.

**Conclusion:**

Our results suggest that QoL after thoracic surgery in selected octogenarians is comparable to preoperative QoL. Since health in elderly people is the most important factor to maintain a good QoL, denial of surgical treatment due to advanced age seems to be no longer acceptable.

**Disclosure:** No significant relationships.

P-256

## POSSIBILITIES OF RESECTIONAL SURGERY AND THORACOPLASTY IN COMPLEX TREATMENT OF MULTIDRUG-RESISTANT/EXTENSIVELY DRUG-RESISTANT LUNG TUBERCULOSIS

Nikolay Opanasenko<sup>1</sup>, A. Kshanovsky<sup>1</sup>, M. Kalenichenko<sup>1</sup>, O. Obremskaya<sup>2</sup>, R. Demus<sup>1</sup>, V. Borisova<sup>2</sup>

<sup>1</sup>*Thoracic Surgery and Invasive Diagnostic Methods, National Institute of Phthisiology and Pulmonology named after F.G. Yanovsky NAMS of Ukraine, Kiev, Ukraine*

<sup>2</sup>*Anesthesiological, National Institute of Phthisiology and Pulmonology named after F.G. Yanovsky NAMS of Ukraine, Kiev, Ukraine*

### Objectives:

With growing resistance of mycobacterium tuberculosis conservative treatment less leads to the recovery of the patient. In this situation role of surgical treatment is greatly increasing. In the study we have identified this role.

### Methods:

We performed retrospective analysis of 347 patient's medical records that underwent resectional surgery by open thoracotomy or thoracoplasty due to MDR/XDR (Multidrug-resistant/extensively drug-resistant) pulmonary tuberculosis (TB) from 2005 to 2014. Chronic forms of TB was diagnosed in 257 (74.5 %) cases. TB of tracheobronchial tree was observed in 41 (11.8 %) patients. Surgical intervention was performed after total finishing of the main antimycobacterial treatment course (according to drug sensitivity test) on a stage of stabilization of process in the lungs and absence of specific lesions in the bronchial tree. In the preponderance majority of operations individual dissection of pulmonary vessels and bronchus had been performed. Effectiveness of surgical treatment assessed by a termination of mycobacterial excretion with sputum and closure of destructive intrapulmonary cavities (confirmed by computed tomography).

### Results:

Segmentectomies was performed in 67 (19.3%) cases, lobectomies and bilobectomies – in 178 (51.3%) patients, pneumonectomies and completion pneumonectomies – in 64 (18.4%) cases, and 38 (11.0%) circumstances of primary extrapleural thoracoplasty. Intrapleural thoracoplasty with removal of first two or three ribs complemented lobectomies and bilobectomies in 58 (32.6 %) cases. Operative treatment was effective in 62 (92.5%) patients after segmentectomies, 163 (91.6%) cases after lobectomies and bilobectomies, 54 (84.4%) cases after pneumonectomies and completion pneumonectomies and in 29 (76.3 %) patients after primary extrapleural thoracoplasty. The most common postoperative complication after segmentectomies and lobectomies was prolonged air leak. New course of intensive long-term antimycobacterial treatment was prescribed to all patients after the intervention.

### Conclusion:

Resectional surgery and primary extrapleural thoracoplasty play essential role of complex treatment of MDR/XDR pulmonary TB due to rising lack of efficacy of conservative therapy.

**Disclosure:** No significant relationships.

P-257

**SEVERE NECROTIZING PNEUMONIAS COMPLICATED WITH SECONDARY EMPYEMAS**

Marcelo Parra<sup>1</sup>, F. Gattini<sup>2</sup>, F. Descalizi<sup>3</sup>, G. Schiapacasse<sup>4</sup>, V. Sanhueza<sup>5</sup>

<sup>1</sup>*Thoracic Surgery, Hospital Padre Hurtado. Clinica Alemana - Universidad del Desarrollo School of Medicine, Santiago, Chile*

<sup>2</sup>*Internal Medicine Residency, Hospital Padre Hurtado. Clinica Alemana - Universidad del Desarrollo School of Medicine, Santiago, Chile*

<sup>3</sup>*Respiratory, Hospital Padre Hurtado. Clinica Alemana - Universidad del Desarrollo School of Medicine, Santiago, Chile*

<sup>4</sup>*Imaging, Hospital Padre Hurtado. Clinica Alemana - Universidad del Desarrollo School of Medicine, Santiago, Chile*

<sup>5</sup>*Pathology, Hospital Padre Hurtado. Clinica Alemana - Universidad del Desarrollo School of Medicine, Santiago, Chile*

**Objectives:**

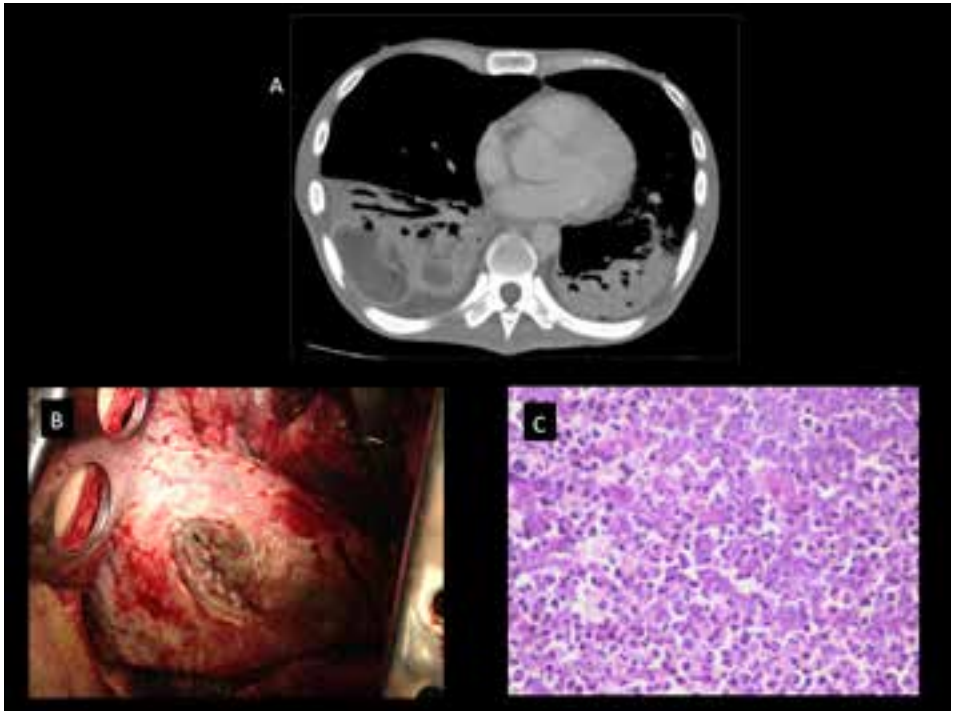
Necrotizing pneumonia (NN) complicated with empyema is a life threatening condition that challenges all ICU, respiratory & cardiothoracic surgery units. The aim of this study is to make an epidemiological characterization of these patients, and secondarily analyse their treatment and outcomes.

**Methods:**

A retrospective analysis of a series of consecutive patients experiencing NN with empyema who presented at Padre Hurtado Hospital, Santiago, Chile was performed from February to August 2014. Their records were abstracted through personal demographics (age, sex, comorbidities and risk factors), procedures performed, intra-operative findings, bacteriology, and outcome information (length of stay, need of ICU, complications, and mortality).

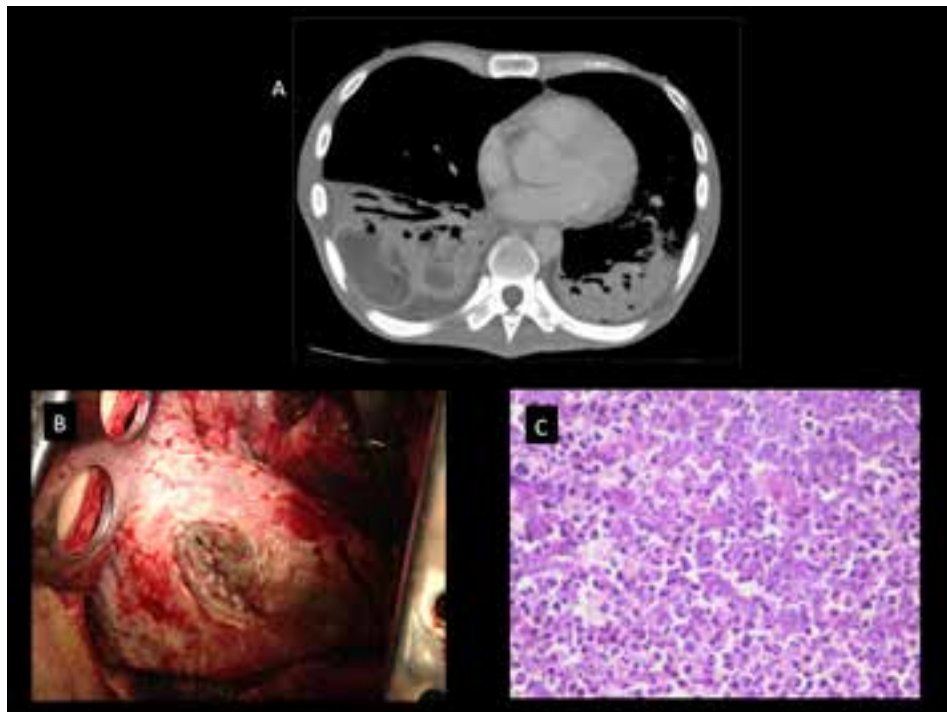


**Case description:**



**Results:**

Of nine consecutive patients who presented to the emergency department with NN with empyema, seven (77.78%) were male. The median age was 53 (range 21-73) years. Forty-four percent presented comorbidities (Diabetes, HBP, and neurological diseases). Forty-four percent presented drug abuse consumption and three (33,33%) were in a state of severe malnutrition. The median time of hospitalization was 41 days (range 16-129). Thoracotomies were performed in eight (83.23%) of the patients. In four patients the isolated germ was *Enterococcus Faecalis*. Thoracic complications occurred in three (33,33%) patients. One patient required a lobectomy, one patient required a fenestration and finally one (11,11%) patient died.

**Conclusion:**

NN complicated with empyema are rare, and there is no explanation why we had so many cases in such a brief period of time. However, if the association of drug abuse, diabetes and malnutrition keeps occurring we will continuously see these cases challenging our thoracic surgery team and ICUs with high morbidity and mortality.

**Disclosure:** No significant relationships.



P-258

## **RADICAL, MINIMALLY INVASIVE LUNG VOLUME REDUCTION SURGERY FOR ADVANCED LUNG EMPHYSEMA – TREATMENT ALGORITHM AND FIRST CLINICAL RESULTS**

Bassam Redwan<sup>1</sup>, M. Semik<sup>1</sup>, S. Freermann<sup>1</sup>, N. Dickgreber<sup>2</sup>, J. Fichter<sup>2</sup>, S. Fischer<sup>1</sup>

<sup>1</sup>*Thoracic Surgery and Lung Support, Klinikum Ibbenbueren, Ibbenbueren, Germany*

<sup>2</sup>*Thoracic Oncology and Respiratory Medicine, Klinikum Ibbenbueren, Ibbenbueren, Germany*

### **Objectives:**

LVRS represents an important treatment option for patients with advanced lung emphysema. Recently, endoscopic lung volume reduction was reported. Endobronchial valves leading to complete atelectasis of a whole lobe mimic the situation following lobectomy. However, a high complication rate is observed, and long-term results are questionable. Here we report a novel, radical VATS-LVRS approach and first clinical results.

### **Methods:**

Between 05/13 and 10/2014 all patients undergoing VATS-LVRS were analyzed retrospectively. Preoperatively, lung function testing (LFT), computed tomography of the chest and ventilation perfusion lung scan (V/Q scan) were evaluated. At admission and prior to discharge 6-minute-walk test (6-MWT) and a capillary blood gas analysis (BGA) were performed.

### **Results:**

54 patients (18 females, mean age 63 years) underwent VATS-LVRS. In 50 patients, surgery was performed completely via VATS. In 4 cases, conversion to lateral thoracotomy was necessary due to massive intrathoracic adhesions (n=3) and bleeding of the pulmonary artery (n=1). 10 patients underwent unilateral VATS-LVRS. Intraoperatively, target zones with the most significant shunt as identified by V/Q scan were resected radically. These comprised resection of the upper lobe (n=41), middle lobe (n=1), lower lobe (n=23), lingula (n=1), segment-6-sparing lower lobe (n=12) and lingula-sparing upper lobe (n=20). Mean hospital stay was 19 days. Postoperative complications included recurrent sputum retention requiring bronchoscopy (n=9), persisting air leak (n=18), atrial defibrillation (n=6), wound healing disturbance (n=4), respiratory insufficiency requiring mechanical ventilation via tracheostomy (n=5) and ECLS therapy (n=2) as well as cardiac failure (n=2). 30-day-mortality was 5%. At discharge, a significant improvement of the 6-MWT (291.3 vs. 221.2, p<0.05) and oxygenation (81.8 vs. 68.5, p<0.05) were observed.

### **Conclusion:**

Targeted, radical VATS-LVRS leads to a significant improvement of the exercise capacity and oxygenation in patients with advanced lung emphysema. Due to the complex patient collective, such procedures should be carried out in specialized high-volume centers.

**Disclosure:** No significant relationships.

P-259

**LIMITING FACTORS OF MAXIMUM OXYGEN DELIVERY TO TISSUES IN PATIENTS UNDERGOING PULMONARY RESECTION FOR LUNG CANCER**

E. Curto, C. Martin, A. Rodó, R. Aguiló, Albert Rodriguez, J. Gea, D. Rodríguez  
*Thoracic Surgery, Hospital del Mar, Barcelona, Spain*

**Objectives:**

Measurement of maximum oxygen (O<sub>2</sub>) delivery to tissues (VO<sub>2</sub>max) during an incremental cardiopulmonary exercise test is a key-point in the evaluation of the surgical risk in patients considered for pulmonary resection for lung cancer (LC). The absolute value of VO<sub>2</sub>max is determined by age, gender, respiratory and/or cardiovascular comorbidity, and some other factors, such as muscle conditioning. We hypothesized that identifying the factors limiting VO<sub>2</sub>max may improve the pre-operative stratification of the surgical risk.

**Methods:**

We retrospectively studied all consecutive patients that underwent surgery for LC with curative intention (years 2009-13) from a prospective data-base. Pre-operative evaluation of the risk was performed as recommended by international guidelines. Patients were grouped as having presented or not post-operative complications. Determinants of VO<sub>2</sub>max were analyzed by group using the lineal regression.

**Results:**

Patients included were 156, (101 lobectomies); 87% male; age, 66 (8) [mean (DE)] years. Fifty (32%) patients presented post-operative complications; respiratory, 16 (10%); cardiac, 32 (20%). VO<sub>2</sub>max showed no significant differences between groups, 15 (3) and 16 (2) ml/kg/min, respectively, p=0,121. However, the independent variables limiting pre-operative VO<sub>2</sub>max in patients that presented post-operative complications were the American Society of Anesthesiology (ASA) performance score, the diffusing lung capacity for the carbon monoxide, the O<sub>2</sub> arterial partial pressure (PaO<sub>2</sub>), and comorbidities (mainly diabetes, heart failure and/or arrhythmia), explaining the 81% of the variance, p=0.0027, whereas in the group non-complicated patients were the body mass index, the forced expiratory volume in one second, and the PaO<sub>2</sub>, explaining only the 40% of the variance, p=0,039.

**Conclusion:**

Limiting factors of the absolute value of pre-operative VO<sub>2</sub>max may be different between patients that will present post-operative complications after lung resection for LC. A higher ASA score and cardiovascular and/or pulmonary comorbidity seem to play a relevant role in these differences.

**Disclosure:** No significant relationships.

P-260

**EXTRAPLEURAL PNEUMONECTOMY, LUNG SPARING SURGERY PLUS HYPERTHERMIC PERFUSION CHEMOTHERAPY; WHICH IS THE WINNER?**

A.F. Işık<sup>1</sup>, M. Şanlı<sup>1</sup>, Ö. Dikensoy<sup>2</sup>, Ilknur Aytekin<sup>1</sup>, M.Y. Benli<sup>1</sup>, A. Sevinç<sup>3</sup>, B. Tunçözgür<sup>1</sup>, C. Camcı<sup>3</sup>, L. Elbeyli<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Gaziantep University, Gaziantep, Turkey*

<sup>2</sup>*Chest Disease, Gaziantep University, Gaziantep, Turkey*

<sup>3</sup>*Medical Oncology, Gaziantep University, Gaziantep, Turkey*

**Objectives:**

Multimodal treatment has been tried to obtain better comfort and longer survival in malignant pleural mesothelioma (MPM). One of them is hyperthermic perfusion chemotherapy (HIPEC) which is performed for eradicating tumor cells after cytoreductive surgery. We aimed to compare extrapleural pneumonectomy with lung sparing surgery plus HIPEC by means of survival and disease free interval.

**Methods:**

We investigated retrospectively the data related to MPM patients who underwent surgical procedures including EPP alone (group 1), palliative pleurectomy (PP) alone (group 2), and lung sparing cytoreductive surgery plus HIPEC (group 3) in our clinic between January 2002 and June 2014. A total of 73 patients were included. Cases with biphasic and sarcomatoid histology were classified in the same group.

**Results:**

There were 73 patients with a mean age of 55.9 years. Histopathological types of malignant mesothelioma were epithelial in 60 cases and biphasic or sarcomatoid in 13 cases. Median survival in group 1, 2 and 3 were 5, 6 and 27 months, respectively. Overall median survival was found to be 15 and 20 months in epithelial and biphasic tumors, respectively. In HIPEC group, there was no significant difference between epithelial and biphasic histology (Median, 28 and 27 months, respectively). This study showed that mean survival was significantly higher in the group of P/D plus HIPEC compared to EPP or PP alone. We observed that survival of non-epitheloid cases was similar to those with epitheloid MPM in this group.

**Conclusion:**

In conclusion, it is clear that P/D plus HIPEC provides better survival compared to EPP or PP alone in cases with MPM. The results of this study also support the idea of using P/D plus HIPEC in cases with non-epitheloid cases of MPM.

**Disclosure:** No significant relationships.

P-261

**EPITHELIOID MALIGNANT PLEURAL MESOTHELIOMA: IMPORTANCE OF EXTRAPLEURAL LYMPH NODE METASTASIS AND TRIMODALITY TREATMENT**

Hasan F Batirel<sup>1</sup>, N.O. Ermerak<sup>1</sup>, T. Lacin<sup>1</sup>, M. Metintas<sup>2</sup>, G. Ak<sup>2</sup>, F. Yumuk<sup>3</sup>, H.B. Caglar<sup>4</sup>, R. Ahiskali<sup>5</sup>, B. Yildizeli<sup>1</sup>, M. Yuksel<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Marmara University Faculty of Medicine, Istanbul, Turkey*

<sup>2</sup>*Lung and Pleural Cancers Research and Clinical Center, Eskisehir Osmangazi University, Eskisehir, Turkey*

<sup>3</sup>*Internal Medicine, Division of Medical Oncology, Marmara University Faculty of Medicine, Istanbul, Turkey*

<sup>4</sup>*Radiation Oncology, Medipol University Faculty of Medicine, Istanbul, Turkey*

<sup>5</sup>*Pathology, Marmara University Faculty of Medicine, Istanbul, Turkey*

**Objectives:**

Epithelioid histology is a favorable factor in malignant pleural mesothelioma (MPM). We analyzed our epithelioid MPM experience to identify prognostic factors.

**Methods:**

All patients who had surgery and a histologic diagnosis of epithelioid MPM were included. The data was collected prospectively. Demographics, pulmonary function tests, side, clinical and pathologic TN (T1+2/T3+4; N0/N2/Nx), type of surgery (extrapleural pneumonectomy [EPP]+extended [EPD]+total [TPD]/partial pleurectomy decortication[PPD]+VATS+explorative thoracotomy [ET]), mortality, hospital stay, resection (R1/R2), type of treatment (Only Surgery/Bimodality [Chemotherapy and Surgery]/Trimodality), and recurrence were recorded. Prophylactic incisional irradiation was not counted as a modality. Postoperative mortalities were not included in the survival analysis. Kaplan-Meier Survival and stepwise multivariate analysis were performed.

**Results:**

Ninety-eight patients (57 males, 54.4 ± 10.4 years, 61 right) had surgery in 12 years (2003-2014). In 52, there was history of environmental asbestos exposure. Average FEV1 was 2.06 ± 0.47L. Surgical procedures were EPP (n=36), EPD (n=10), TPD (n=10), PPD (n=26), VATS (n=8), ET (n=8). There were 7 in-hospital mortalities (5 EPP and 2 EPD). Average hospital stay was 7.6 ± 3.9 days. Overall median and 5-year survivals were 20.2 months and 19% respectively. Recurrence in locoregional, distant and both sites was observed in 52, 11 and 8 respectively. In univariate analyses, significant factors were T stage (T1+2[n=48] 23.4 vs T3+4[n=43] 14.1 months, p=0.04), N stage (N0[n=42] 30.1 vs N2[n=16] 13.1 vs Nx[n=32] 14.1 months, p=0.025) and type of treatment (Only surgery[n=8] 6.2 vs Bimodality[n=51] 18.2 vs Trimodality[n=32] 27.6 months, p<0.001). In multivariate analysis most significant factor was N stage (p<0.001), followed by type of treatment (p=0.003) and T stage (p=0.027). In 22 who were T1+2, N0 and had trimodality treatment median and 5-year survivals were 30.1 months and 31% respectively.



**Conclusion:**

Early stage node negative patients who complete trimodality treatment enjoy a long-term survival in epithelioid MPM.

**Disclosure:** No significant relationships.

P-262

**COULD BE THE ASSOCIATION BETWEEN LOW VENTILATORY SUPPORT AND SURGICAL STABILIZATION THE IDEAL APPROACH IN THE MANAGEMENT OF FLAIL CHEST?**Duilio Divisi, G. Di Leonardo, R. Crisci*Thoracic Surgery, University of L'Aquila, "G. Mazzini" Hospital, Teramo, Italy***Objectives:**

The therapeutic approach to flail chest continues to raise discussion. The purpose of study was to propose the combination of protective mechanical ventilation and surgical treatment to improve outcomes in flail chest (FC) patients.

**Methods:**

From January 2006 to December 2013 we observed 644 chest trauma patients, 27 of whom (4.2%) showed a flail chest. Injury Severity Score was  $36 \pm 9$  and chest Abbreviated Injury Scale was  $3 \pm 1$ ; all patients displayed a pulmonary contusion. Respiratory failure ( $\text{PaO}_2 < 60$  mmHg;  $\text{PaCO}_2 > 50$  mmHg;  $\text{SaO}_2 < 90\%$ ) justified endotracheal intubation. Patients underwent positive end-expiratory pressure (PEEP) of  $6 \pm 1$  cm of water for  $4 \pm 1$  day and then the surgical stabilization with Judet struts or titanium plates. Spirometry and blood-gas analysis carried out at 1<sup>st</sup>, 3<sup>rd</sup>, 6<sup>th</sup> and 12<sup>th</sup> months after surgery. Quality-adjusted life (QAL) was evaluated at 1<sup>st</sup>, 3<sup>rd</sup>, 6<sup>th</sup>, 12<sup>th</sup> and 24<sup>th</sup> months after discharge from the hospital.

**Results:**

Patients were extubated after  $6 \pm 1$  hours of intervention. The intensive care unit stay was 1 day, while the thoracic department permanence was  $4 \pm 1$  day. The percent forced vital capacity, forced expiratory volume in 1 second and carbon monoxide diffusing capacity gradually increased, reaching over 90% at 3<sup>rd</sup> postoperative month ( $p=0.0001$ ).  $\text{PaO}_2$  improved significantly between 1<sup>st</sup> and 3<sup>rd</sup> month after surgery ( $p=0.008$ ). QAL improved over time, although the highest percentage of beneficial effects was noticed within month 3 ( $p=0.0004$ ). Patients returned to full-time employment at  $4 \pm 1$  month of hospital discharge.

**Conclusion:**

The combination between conservative and surgical treatment of flail chest reduced complications and made the return to a normal work of patients easier and faster.

**Disclosure:** No significant relationships.





P-263

**LATERAL THORACIC EXPANSION FOR JEUNE SYNDROME:  
AN INSTITUTIONAL EXPERIENCE**M. Yüksel<sup>1</sup>, Nezih Onur Ermerak<sup>1</sup>, A. Issaka<sup>1</sup>, Z. Bilgi<sup>1</sup>, K. Bostancı<sup>1</sup>, G. Kıyan<sup>2</sup><sup>1</sup>*Thoracic Surgery, Marmara University Hospital, Ustkaşnarca/Istanbul, Turkey*<sup>2</sup>*Pediatric Surgery, Marmara University Hospital, Istanbul, Turkey***Objectives:**

Jeune's asphyxiating thoracic dystrophy is also known as Jeune's Syndrome is a rare autosomal recessive disorder characterized by typical skeletal dysplasias, such as a narrow thorax. Lateral thoracic expansion is the treatment of choice for these patients. We report our series of 3 patients who were treated bilateral or unilateral thoracic expansion.

**Methods:**

All patients are diagnosed based on radiological and clinical evidences. The first patient was 16 years old boy with dyspnea on exertion. Lateral thoracic expansion operation was performed on the left and 2 ribs were expanded using titanium plates. Three months later right side had been operated and five ribs were expanded. Expansion on the right side was found insufficient and patient was reoperated on right side. The first patient was also operated for scoliosis 1 year after our surgeries. On the second patient 3 ribs were divided and expanded with titanium plates. Unfortunately, patient passed away on postoperative 6<sup>th</sup> day as a result of septic shock. Third patient was 2 years old male patient who was referred to our outpatient clinic. 5 ribs were divided and expanded on the right side with titanium plates. Left side have been operated successfully 1 year after the first operation and 5 ribs were expanded.

**Results:**

The symptoms of the first patient were relieved and better pulmonary functions were detected on tests. We couldn't analyse the second and the third patient in terms of symptoms and pulmonary function tests because second patient passed away and the third one can't perform pulmonary function tests.

**Conclusion:**

Lateral thoracic expansion is a satisfactory surgical technique which creates an expansion on thorax of the patient. It relieves the symptoms together with good cosmetic results.

**Disclosure:** No significant relationships.

## P-264

**SIZE OF PRIMARY SPONTANEOUS PNEUMOTHORAX AS SURGICAL INDICATION ON FIRST EPISODE**

Carlos Fraile<sup>1</sup>, J.R. Jarabo<sup>1</sup>, I. Cal<sup>1</sup>, A. Gomez<sup>1</sup>, L. Milla<sup>2</sup>, J. Calatayud<sup>1</sup>, E. Fernández<sup>1</sup>, F. Carracedo<sup>1</sup>, F. Hernando<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Hospital Clínico San Carlos, Madrid, Spain*

<sup>2</sup>*Thoracic Surgery, Complejo Hospitalario de Navarra, Pamplona, Spain*

**Objectives:**

Surgical indications for primary spontaneous pneumothorax (PSP) are persistence air leak and recurrence. We try to prove that grade of first episode of PSP is related with the probability of persistence and/or recurrence, and could support by itself early surgical treatment.

**Methods:**

We analyzed our series of patients with first episode of PSP diagnosed and treated in our department between 2001 and 2010. Patients under 45 years old were included. Age, gender and toxic habits were analyzed. Pneumothorax was classified according to its quantity in chest X-ray: partial (apical PTX), complete (total separation of the lung) and total (complete lung collapse, with or without clinical criteria of tension pneumothorax). Grade of pneumothorax was correlated (pearson chi-square) with drainage indication, lung expansion, persistence, and recurrence after at least two years-follow up.

**Results:**

Grade of pneumothorax	Surgery first episode	Surgery due to recurrence	Patients finally undergoing surgery
Partial (n=45)	3	14	17 (37.7%)
Complete (n=135)	20	31	51 (37.7%)
Total (n=82)	32	17	49 (59.8%)

We included 262 patients, 194 being male (74%), with median age of 25y (r15-45). First episode of pneumothorax was partial in 10.3%, complete in 55.8% and total in 31.3%. Chest drain insertion was made in 55.6% of partial and 100% of complete and total pneumothorax ( $p<0.01$ ). Lung re-expansion was achieved in 93.3% of partial, 85.2% of complete and 62.2% of the cases. 20.6% were operated during the hospitalization due to persistent air leak or incomplete expansion, 6.7% of partial, 14.8% of complete and 39% of total pneumothorax ( $p<0,01$ ). Recurrence was reported in 62 non-operated patients, 22.6%, 50% and 27.4% with partial, complete and total pneumothorax respectively. Patients who underwent surgery, regardless when it was performed, were 37.7% of those with partial, 37.7% complete and 59.8% total pneumothorax (table1).

**Conclusion:**

Need for surgery among patients with first episode of PSP with complete collapse of the lung was almost 60% in our series. We think that these results could justify the establishment of surgical indication for these selected patients in first episode of PSP.

**Disclosure:** No significant relationships.



P-265

**TUMOR VOLUME: AN IMPORTANT PREDICTOR OF SURVIVAL IN MALIGNANT PLEURAL MESOTHELIOMA**

Diana Kircheva, A. Husain, S. Watson, H. Kindler, A. Durkin, W. Vigneswaran  
*Surgery, University of Chicago Medicine, Chicago, United States of America*

**Objectives:**

TNM Staging System for malignant pleural mesothelioma (MPM) has become a worldwide standard but has many limitations. Tumor volume has been suggested as a predictor of survival. Due to the complex anatomy estimation of tumor volume via CT scan can be challenging. Surgical volume may be more accurate. We therefore prospectively determined tumor volumes and weights in 116 consecutive patients undergoing extended pleurectomy and decortication (EPD) and correlated with overall survival and T and N stage.

**Methods:**

We evaluated 116 specimens of patients undergoing EPD for MPM in a University center in a six year period. All specimens were weighed, and volume measured by the fluid displacement method. Cox regression model was used to identify significant predictors of survival, hazard ratios were calculated. Kaplan-Meier was used to summarize overall and sub group survival. Logistic regression models were used to identify predictors of T and N stage.

**Results:**

There were 95 males and 21 females with a median age of 68+9 years. There were 41 patients in WHO Performance status (PS) 0, 70 in 1 and 4 in 2. The median time between initial diagnosis and surgery was 134 days. Histology: epithelioid: 59; biphasic: 55; sarcomatoid: 2. Median volume was 642±400ml and weight was 614±364g. Two year survival from initial diagnosis and EPD were 44% and 28% respectively. PS (p=0.002), Epithelioid histology (p<0.001), tumor weight (p<0.001), Platelet count (p=0.015) were predictor of survival. Tumor volume was a marginal predictor of T stage (p=0.048) and survival (p=0.03). No relationship between N stage and either tumor volume, weight or histology noted.

**Conclusion:**

PS, Tumor weight epithelioid histology and platelet count are significant predictors of survival in patients undergoing EPD for MPM. There is a correlation between tumor volume and T stage. These data suggest that tumor weight and volume may be valuable components for staging MPM.

**Disclosure:** No significant relationships.

P-266

**3D PRINTING A BONY CHEST WALL FROM CT-SCAN DATA AS AN ADJUNCT TO PROSTHETIC RECONSTRUCTION AFTER CHEST WALL RESECTION**

Krizun Loganathan<sup>1</sup>, D. West<sup>2</sup>, I. Rahman<sup>3</sup>, P. McElnay<sup>4</sup>

<sup>1</sup>*School of Medicine, University of Bristol, Bristol, United Kingdom*

<sup>2</sup>*Thoracic Surgery, University Hospital Bristol NHS Foundation Trust, Bristol, United Kingdom*

<sup>3</sup>*University of Bristol, Bristol, United Kingdom*

<sup>4</sup>*Cardiothoracic Surgery, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle, United Kingdom*

**Objectives:**

Resection of the bony chest wall is usually reconstructed with a rigid prosthesis, often a nylon mesh and methylmethacrylate (MMA) sandwich. Currently prostheses are fashioned intra-operatively by visual estimation. 3D printing of a prosthetic mould may save operative time and produce a more accurate reconstruction. We aimed to explore the feasibility of 3D printing a human bony hemithorax to aid prosthesis manufacture. Based on a recent systematic review, this would be the first recorded use of 3D printing in thoracic surgery.

**Methods:**

CT scan of a 67 year-old male patient was used to test the feasibility of creating a 3D model. CT scan bony reconstruction images were converted to a 3D-print compatible format using the SPIERS™ software package. The specific steps undertaken were recorded together with the learning points, challenges, and advantages of this novel technique.

**Results:**

A completed 3D rendering of the patient's left thoracic cage was generated in .stl format, compatible with most 3D printers, and a graspable model was printed. Specific techniques to deal with technical difficulties at the thoracic inlet and costal cartilages were developed. A scaled down graspable model was printed using facilities available at the university.

**Conclusion:**

This proof of concept exercise shows that 3D printing of a human bony chest wall from CT scan images is possible with existing software. Technical challenges encountered with rendering costal cartilages and the thoracic inlet could be overcome. The potential advantages include printing a hemithorax by mirroring the contralateral side in cases of existing deformity or destruction, reduced theatre time, improved aesthetics, better planning and patient education.

**Disclosure:** No significant relationships.



P-267

## LOW COST METHOD FOR CHEST WALL RECONSTRUCTION AFTER RESECTION FOR TUMORS

Ioan Petrache, G.V. Cozma, C. Tunea, V. Voiculescu, I. Miron, A. Nicola, A. Nicodin, O. Burlacu

*Thoracic Surgery Clinic, Clinical Municipal Hospital, Timisoara, Romania*

### Objectives:

Chest wall tumors are very common and are suited for wide resections with oncologic margin, the reconstruction and stabilization of the thorax is crucial for the outcome of these patients. There are many high tech solutions for this problem that imply high costs. We present our experience using low cost materials.

### Methods:

We analyzed a series of 184 patients that underwent surgery in our department in a 14 years period (2001 – 2014), aged between 21 and 74 years old. 135 patients had primary, secondary or contiguous malignancies of the chest wall. The surgical procedures applied were chest wall resection followed by reconstruction (74.6% of cases) with several types of low cost synthetic materials such as methylmetacrylate, reinforced marlene mesh, or the use of interlaced tension suture of the defect, including after subtotal sternectomy, as follows: we placed the stiches all alongside the defect margin, we tied them together to obtain a tensioned, interlaced web similar to a spider web to cover all the defect area. We covered the web using vicinity muscle flaps. 25.4% of the cases required no stabilization.

### Results:

In all the cases the perioperative mortality was zero. The mean hospital stay was 8 days. The immediate postoperative outcome of the patients was good in 180 cases, 3 cases developed wound seroma that was managed by conservative treatment and one patient underwent a second surgery using muscular flap after stabilization with methylmetacrylate (rejected material).

### Conclusion:

Although very cheap, methylmetacrylate did cause reject and further surgery was necessary. The usage of the interlaced tension non-resorbable stiches for the suture of the defect provided optimal stabilization of the chest wall, with no morbidity and gave us satisfaction. Taking into account the low cost of the materials, we consider this method optimal for units in low/middle income countries.

**Disclosure:** No significant relationships.

**P-268****PREDICTION MODEL OF PLEURAL DRAINAGE BASED ON ELECTRONIC CONTINUOUS FLUID MEASUREMENT**

R. Hristova, Cecilia Pompili, K. Papagiannopoulos, R. Milton, N. Chaudhuri, M. Kefaloyannis, A. Brunelli  
*Department of Thoracic Surgery, St. James's University Hospital Bexley Wing, Leeds, United Kingdom*

**Objectives:**

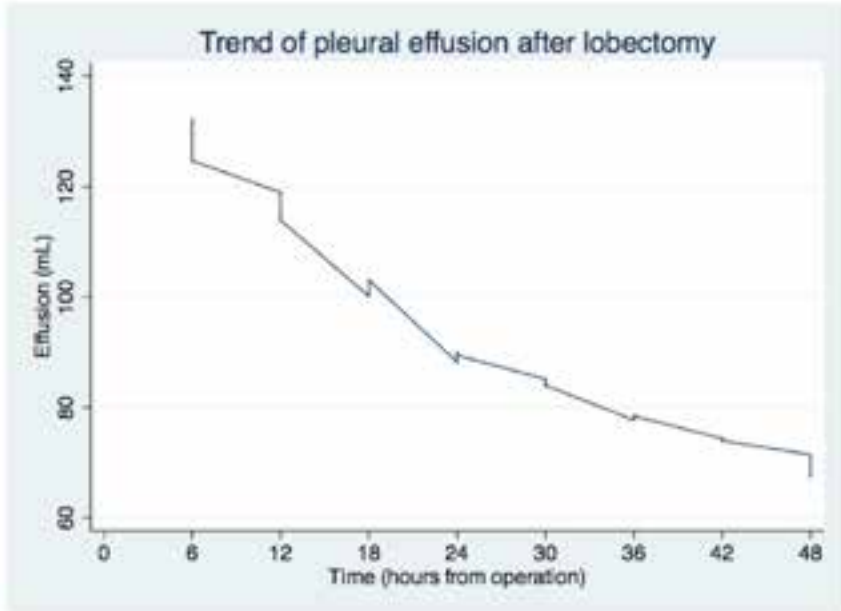
To verify whether the volume of pleural fluid drained in the first 6 hours after lobectomy is associated with the volume drained in the subsequent 24 hours by using an electronic continuous recording of pleural effusion.

**Methods:**

Prospective analysis on 50 consecutive patients undergoing pulmonary lobectomy. A single 28Fr chest tube was connected to a regulating drainage system (8 cmH<sub>2</sub>O) and featuring electronic continuous monitoring of airflow and fluid. Several baseline and surgical variables were tested for a possible association with total fluid drained from the 6<sup>th</sup> to 30<sup>th</sup> postoperative hour (EFF6-30) including the pleural fluid collected in the first 6 hours (mL). Linear regression and bootstrap analyses were used to derive a model to estimate the total effusion drained from the 6<sup>th</sup> to the 30<sup>th</sup> postoperative hour.

**Results:**

The average effusion in the first 6 hours was 172mL (range 0mL to 449mL). Figure shows the trend of effusion recorded in the first 48 hours. The following variables were associated with the effusion 6-30: effusion in the first 6 hours ( $p=0.001$ , bootstrap 96%) and lower lobectomy ( $p=0.05$ , bootstrap 51%). We created the following model: 187.5mL +7.6mL X every 10 ml effusion first 6 hours + 95mL in case of lower lobectomy. The model was validated in 1000 bootstrapped samples, showing no difference ( $p>0.05$ ) between predicted and observed effusion in 92% of samples. A hypothetical patient draining 100mL in the first 6 hours after lower lobectomy would have an expected effusion of 311mL in the subsequent 24 hours.

**Conclusion:**

By using an electronic continuous monitoring of pleural effusion, we found that the volume of fluid drained in the very first hours after lobectomy is associated with the effusion drained in the following 24 hours. The model can assist for planning early and safe removal of chest tube in case of absence of air leak.

**Disclosure:** K. Papagiannopoulos: Consultancy Medela  
A. Brunelli: Consultancy Medela

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**THE PREDICTIVE POWER OF RIB-FRACTURES IN RELATION TO MORBIDITY AND MORTALITY– RESULTS FROM A RETROSPECTIVE CASE-CONTROL STUDY**Torsten Schulz<sup>1</sup>, G. Vassilev<sup>2</sup>, E. Rössner<sup>2</sup>, U. Obertacke<sup>3</sup>, M. Scheele<sup>3</sup>, K. Nowak<sup>2</sup><sup>1</sup>Medical Faculty of Mannheim, University Heidelberg, Mannheim, Germany<sup>2</sup>Surgical Department, University Medical Centre of Mannheim, Mannheim, Germany<sup>3</sup>Trauma Surgery Department, University Medical Centre of Mannheim, Mannheim, Germany**Objectives:**

Since the beginning of the 1980's different authors discussed the relation between rib-fractures and the clinical outcome of traumatized patients. We hypothesized, that an increasing number of rib-fractures is worsening the outcome of our patients.

**Methods:**

290 cases of thoracic trauma were collected retrospectively from October 2008 till June 2013. All patients were initially delivered by the emergency service to the university medical centre of Mannheim. All cases were separated in three different groups: "single rib fracture", "two fractured ribs" and "multiple rib fractures". Those groups were compared with the Kruskal-Wallis- test. Additionally we performed a logistic regression for mortality and morbidity in dependence of an increasing number of rib-fractures. Cut- off- values were created and described by sensitivity, specificity, area und the curve and odds ratios. The statistical analysis was performed with SAS 9.4. A p-value  $\leq 0,05$  was statistical significant.

**Results:**

Using a unidimensional analysis proofed an increasing mortality and morbidity in relation to a rising number of broken ribs. Additionally the AIS- Chest, the ISS – Score and the length of stay were also significantly correlating. Using a multidimensional regression indicated Odds-Ratios ranking from 1.05 (morbidity) to 1.10 (mortality). Our logistic regression calculated a Cut- off- value of four ribs for mortality (sensitivity 66%, specificity 60%). Additionally, a Cut-off-value of three for morbidity was generated (Sensitivity 73%, Specificity 37%).

**Conclusion:**

Using a univariant analysis, the number of fractured ribs is associated with a higher morbidity or mortality. However, in a multivariate analysis the number of rib fractures was not found to be an independent predictor of clinical outcome.

**Disclosure:** No significant relationships.





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**WARM VERSUS COLD DONOR LUNG ISCHEMIC PRESERVATIONS ACTIVATE DISTINCT MECHANISMS DURING DEVELOPMENT OF POST-TRANSPLANT PULMONARY DYSFUNCTION**

Ilker Iskender, M. Cypel, M. Chen, J. Sakamoto, H. Kim, K. Yu, K. Hashimoto, T.K. Waddell, T. Martinu, M. Liu, S. Keshavjee

*Latner Thoracic Surgery Research Laboratories, University Health Network – University of Toronto, Toronto, Canada*

**Objectives:**

Ischemia-reperfusion injury related to lung transplantation (LTx) is a major contributor to early postoperative morbidity and mortality. Severe lung injury is seen when using donor lungs after prolonged hypothermic preservation or donation after cardiac death. We hypothesized that different injury mechanisms will be associated with increased cold and warm ischemic times (CIT and WIT).

**Methods:**

Donor lung injury was induced with 1) 18h CIT after harvest, and 2) 3h WIT before retrieval. 12h CIT was used as a low-injury control. Left single LTx was performed using a separate ventilation technique. After 2h of reperfusion, pulmonary vein blood gases were analyzed, and the grafts and plasma were harvested for multi-cytokine and M65 assays.

**Results:**

Pulmonary oxygenation (Fig 1A) was significantly worse in both 18hCIT and WIT groups, with higher peak airway pressures (Fig 1B) during the reperfusion, compared to the control. Interleukin (IL)-1 $\alpha$ , IL-1 $\beta$ , IL-18, IL-6, VEGF, and chemokines CCL2, CCL3, CXCL1, and CXCL2 were up-regulated in all groups when comparing end-reperfusion time points to pre-transplant. Notably, graft tissue levels of these analytes were significantly lower in the WIT group compared to the CIT groups. Conversely, systemic plasma levels of all analytes were elevated in the WIT group (Fig 1C; IL-6 shown as example). Levels of plasma M65 were not detectable in the 12hCIT group, but were significantly elevated in both 18hCIT and WIT groups (Fig 1D).

**Conclusion:**

Compared to 12hCIT, pulmonary physiology deteriorated to a similar degree in both the 18hCIT and 3hWIT groups. However, the inflammatory response was more severe locally in grafts after 18hCIT, whereas the systemic response and cell death signal (M65) were more severe in the WIT group. The distinct inflammatory responses indicate that the type of donor lung injury should be carefully considered when developing specific therapeutic strategies to reduce lung injury.

**Disclosure:** No significant relationships.

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**SAFETY OF BIPOLAR HEAT SEALERS FOR LUNG VESSELS DURING A LOBECTOMY**

Miguel Congregado, F. Cozar, N. Pinos, S. Moreno-Merino, P. Carmona, M. Lopez-Porras, J.C. Giron

*General Thoracic Surgery, Virgen Macarena University Hospital, Seville, Spain*

**Objectives:**

VATS lobectomy is nowadays widely accepted as treatment of choice for early-stage non-small-cell carcinoma. The higher rate of conversion due to bleeding mostly involves small segmental arteries. Currently, the vessels are sutured using either endostaplers or clips, but with the introduction of the bipolar heat sealers we have a new tool for it. This device has been widely used in other specialties but the safety and efficacy of these devices in thoracic surgery are currently unclear. We present a descriptive study in 169 lung vessels for lobectomy.

**Methods:**

Since October 2009 we have used a modified bipolar heat sealer to seal and divide arteries during lung lobectomies. We have sealed lung vessels (total 169) less than 7 mm of diameter in the procedures shown in Table 1. Vessel sealing was performed with two seals at the proximal end and one at the distal end, dividing the vessel in the second shot.

		CONVENTIONAL SURGERY		
UPPER LEFT LOBE	LOWER LEFT LOBE			
25 segmentary arteries	1 segmentary artery	11 segment. arteries		
3 lingular arteries	2 VI segmnt arteries			
		VATS		
UPPER LEFT LOBE	LOWER LEFT LOBE	UPPER RIGHT LOBE	MIDDLE LOBE	LOWER RIGHT LOBE
40 segmentary arteries	8 VI segment arteries	51 segment arteries	5 arterial branches	8 VI segment arteries
6 lingular arteries			9 venous branches	

**Results:**

Only 4 cases of bleeding (2.36%) were recorded, in all cases between 10 and 20 minutes after vessel sealing. These bleeding were caused because intense contact between the vacuum and the sealing area or excessive traction of the lung, stressing the seal area. In 3 cases, bleeding was controlled and corrected using the bipolar heat sealer itself; video-assisted vascular stitching was required in only one case.



**Conclusion:**

Our data confirm that bipolar heat sealers are effective and safe for hemostasis in pulmonary vessels as previously demonstrated in studies conducted in other fields. Use of this technique is recommended in segmental branches of pulmonary arteries or veins (all less than 7 mm in diameter) in conventional and thoracoscopic surgery.

**Disclosure:** M. Congregado: Ligasure V<sup>®</sup>, COVIDIEN.

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**USE OF C-REACTIVE PROTEIN AND PROCALCITONIN MEASUREMENT IN SERUM AND PLEURAL FLUID TO PREDICT COMPLICATIONS AFTER LOBECTOMY**Vasileios Kouritas<sup>1</sup>, C. Zisis<sup>2</sup>, I. Bellenis<sup>2</sup>, A. Brunelli<sup>1</sup><sup>1</sup>*Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom*<sup>2</sup>*Cardiothoracic Surgery, Evangelismos Hospital, Athens, Greece***Objectives:**

The investigation of C-reactive protein (CRP) and procalcitonin (PCT) values in serum and pleural fluid in predicting pulmonary complications in lobectomy patients.

**Methods:**

Serum and pleural fluid CRP and PCT values of 33 patients were measured on the 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> day and every 2<sup>nd</sup> postoperative day (POD) thereafter until discharge or until drain removal. Pulmonary complications included ARDS, pneumonia and atelectasis. Time series cross sectional longitudinal regression analysis was performed to verify the association of complication with postoperative variations of serum and pleural CRP and PCT values. CRP>5mg/dl and PCT>0.05 was considered as abnormal.

**Results:**

Six patients developed pulmonary complications (median day of occurrence=POD4). CRP and PCT values in serum and pleural fluid were similar between complicated and non-complicated patients at POD1. CRP was increased in both serum and pleural fluid in complicated vs non-complicated patients at POD3 (serum: 33.5 vs 13.3, p<0.0001; pleura: 6.1 vs 3.3, p=0.008) although CRP (PF) was not abnormal. This increment preceded the clinical and/or radiological appearance of the complication. Similarly, POD3 serum and pleural PCT were significantly higher in complicated patients (serum: 2.3 vs 0.4, p<0.0001; pleura: 1.6 vs 0.2, p=0.0001), all being abnormal. For serum and pleural fluid CRP (p<0.0001 and p=0.02) and PCT (p<0.0001 and p<0.0001) values, the development of pulmonary complications was associated with changes in their levels over time, independent of age, gender, side and site of operation. Pulmonary complications were associated with changes of the blood: pleural fluid CRP ratio over time (p=0.05), but not with changes of blood: pleural fluid PCT ratio (p=0.8).

**Conclusion:**

CRP and PCT values were increased in the serum and pleural fluid of patients with a pre-clinical stage of pulmonary complications. These measurements may be used to monitor the postoperative course and for the early detection and treatment of these complications. Cost-effectiveness analyses are warranted in a larger population.

**Disclosure:** No significant relationships.



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**WHICH VATS LOBECTOMY SHOULD BE THE FIRST IN THE LEARNING CURVE?**

Edoardo Mercadante, D. Spoletini, M. Carlini

*Department of General and Thoracic Surgery, S. Eugenio Hospital, Rome, Italy*

**Objectives:**

To evaluate technical features of the five VATS lobectomies, and to identify the ones that could be considered the first VATS lobectomy to start the training course.

**Methods:**

The first 60 VATS lobectomies performed in our Center were enrolled in the study, and were classified in 5 groups: right upper lobectomy (RUL, group A), middle lobectomy (ML, group B), right lower lobectomy (RLL, group C), left upper lobectomy (LUL, group D), left lower lobectomy (LLL, group E). Bilobectomies and pneumonectomies were excluded from the study because, according to the agreement, should be performed in an advanced phase of experience. We evaluated surgical time, intraoperative blood loss, conversion rate, postoperative drain time and post operative length of stay, intra and post operative complication rate. A numeric difficulty score (1 to 10) was created, based on specific parameters reflecting the difficulty and the time spent to prepare vascular and bronchial hilum elements of each lobectomy.

**Results:**

We performed 25 RUL, 11 RLL, 7 ML, 10 LUL, 7 LLL. No statistical differences were observed for all parameters but the difficulty score. It showed a significative higher values for inferior branches pulmonary artery preparation bilaterally, followed by middle lobe bronchus and left upper lobe bronchus preparation. The lowest score was observed for RUL hilum elements.

**Conclusion:**

Lower lobectomy has been widely considered the easiest open lobectomy. Diffusion of VATS lobectomy was for a long time delayed because it was considered a technically demanding procedure at high risk of intraoperative disasters. Our study shows that, unlike to open lobectomy experience, RUL is the easiest to be performed by VATS approach. Therefore we think that it should be the first lobectomy to begin the training of young thoracic surgeons.

**Disclosure:** No significant relationships.

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**EVALUATION OF THE PERFUSION OF THE GASTRIC SLEEVE AFTER ESOPHAGECTOMY BY LASER-INDUCED FLUORESCENCE OF INDOCYANINE-GREEN BY PINPOINT®**

Kai Nowak, I. Karampinis, F.I. Sandra Petrescu, U. Ronellenfitsch, S. Post  
*Department of Surgery, Mannheim University Medical Center, Mannheim, Germany*

**Objectives:**

Anastomotic leakage after esophagectomy is a common, severe complication associated with increased mortality, often caused by poor perfusion. Until recently surgical experience was the only tool to assess the sufficiency of the blood perfusion of the anastomotic region. Indocyanine-green laser-induced fluorescence has been proposed to evaluate tissue perfusion recently. PinPoint is a newly developed system suitable for evaluation of tissue perfusion during laparoscopic and open procedures.

**Methods:**

Laser-induced fluorescence of Indocyanine-green tissue angiography by PinPoint technology (Novadaq, Canada) was used to evaluate the perfusion of gastric sleeve in 12 patients undergoing esophagectomy with gastric tube reconstruction with intrathoracic / cervical anastomosis. After creating the gastric sleeve 8mg of ICG were intravenously administered and flushed with normal saline. The images were retrieved beginning 5 seconds after the injection. A newly developed software interface was used to analyze the microperfusion data.

**Results:**

After injection of ICG the gastric sleeve showed a rapid homogenous perfusion in the proximal part in all cases. In the area of the tip of the sleeve the area of diminished perfusion determined by the use of PinPoint did not meet in all cases the surgeon's assumed point of the start of malperfusion. In 3 out of 12 cases the sleeve was further shortened after interpretation of PinPoint for anastomosis (video sequence). The sleeve was shortened to the point of homogeneous ICG perfusion in all cases. The advanced software allowed a more objective evaluation of arterial supply, venous drainage and tissue microperfusion due to signal noise reduction of ICG within the tissue (video sequence).

**Conclusion:**

ICG tissue angiography represents a feasible and reliable technical support in the evaluation of perfusion of the gastric tube after esophagectomy. The latest software allows a more objective evaluation of the perfusion. However an exact quantitative perfusion analysis with the camera system is not possible by now.

**Disclosure:** No significant relationships.



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**CD44HIGH/CD24LOW LUNG CANCERS COORDINATELY OVEREXPRESS CANCER TESTIS ANTIGENS**

Brendon Stiles<sup>1</sup>, P. Adusumilli<sup>2</sup>, N. Narula<sup>3</sup>, P. Wagner<sup>4</sup>, D. Buitrago<sup>2</sup>, A. Nasar<sup>1</sup>, P. Lee<sup>1</sup>, J. Port<sup>1</sup>, S. Paul<sup>1</sup>, N. Altorki<sup>1</sup>

<sup>1</sup>*Department of Cardiothoracic Surgery, Weill Cornell Medical College, New York, United States of America*

<sup>2</sup>*Surgery, Memorial Sloan Kettering Cancer Center, New York, United States of America*

<sup>3</sup>*Pathology, Weill Cornell Medical College, New York, United States of America*

<sup>4</sup>*Surgery, Winchester Medical Center, Winchester, United States of America*

**Objectives:**

We have previously demonstrated separately that a CD44high/CD24low cancer stem cell staining pattern and cancer testis antigen (CTA) over-expression are negative prognostic indicators in lung cancer patients. We hypothesized that these two aggressive features are related.

**Methods:**

Using tissue microarrays from two institutions, we previously characterized CD44/CD24 expression in resected lung tumors. From TMA1 (n=95) we analyzed genes significantly overexpressed (publicly available database) in CD44high/CD24low patient tumors (n=17). From TMA2 patients (n=127), qPCR reactions were performed with a panel of gene specific CTA (n=7) primers. Disease free survival (DFS) was estimated using KM, with significance determined by log-rank.

**Results:**

Among the ten most overexpressed genes in CD44high/CD24low patient tumors from TMA1 were three CTAs: MAGEA3/A6 (1.8-fold, #3), XAGE1D (1.68-fold, #6), and PRAME (1.6-fold, #9), suggesting coordinate over-expression of CTAs in these tumors. In tumors from TMA2, MAGEA3 (33%) and MAGEA1 (24%) were the most commonly overexpressed CTAs. Compared to tumors with all other CD44/CD24 staining patterns (n=104), CD44high/CD24low tumors (n=23) were more likely to have high MAGEA3 expression (61% vs. 27%), high expression of any CTA (70% vs. 36%), and coordinate high expression of at least 3 CTAs (48% vs. 12%)(Figure, all p<0.01). High expression of any CTA predicted worse DFS in patients with other CD44/CD24 staining patterns (3-year DFS, 55% vs. 79%, p=0.04). Patients with CD44high/CD24low tumors had poor survival (3-year DFS, 45%), however there were not enough CTA negative tumors among the CD44high/CD24low patients to reliably assess survival differences related to CTA expression.

**Conclusion:**

The CD44high/CD24low staining pattern is strongly associated with coordinate over-expression of CTAs. Because of the known link of CTA expression to hypomethylation, we predict that CD44/CD24 expression may be epigenetically regulated. We also anticipate that due to the immunogenicity of CTAs, some CD44high/CD24low tumors may demonstrate susceptibility to immune-based therapeutic approaches.

**Disclosure:** No significant relationships.

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**CIGARETTE SMOKE INDUCES INHIBITION OF IMMUNE FUNCTIONS AND ALTERATION OF INTERNAL CELL STRUCTURE THROUGH THE DNA DAMAGE IN ALVEOLAR MACROPHAGE**

Minoru Takeuchi, Y. Hirono, M. Takasaki, Y. Tanaka, Y. Tanahashi, M. Sakura  
*Life Science, Kyoto Sangyo University, Kyoto, Japan*

**Objectives:**

Cigarette smoke is the major risk factor for pulmonary diseases and lung surgery. Alveolar macrophages (AM) phagocytize microorganisms, produce reactive oxygen species (ROS) and play an important role of immunological surveillance in lung. In previous studies, we demonstrated that the tobacco smoking inhibits immune functions in AM. However, the mechanism of inhibition of immune functions and alteration of internal cell structure in AM is not well defined. In this study, we investigated whether DNA damage of AM relate to inhibition of immune functions and alteration of cell structure.

**Methods:**

C57Bl/6 mice (female, 8-10 weeks) were exposed to 20 cigarettes/day during 10 days with Hamburg II smoking machine. After exposure, AM were obtained by Broncho Alveolar Lavage (BAL). Surface antigen expressions, phagocyte activity and production of ROS of AM were analyzed by FACS. Internal cell structure of AM was analyzed by light and transmission electron microscope. DNA damages were analyzed by Comet assay.

**Results:**

Expression of surface antigens (CD11, Class II, CD14 and TLR2) on AM were significantly ( $p < 0.05$ ) suppressed in smoked mice (S) as compared with non-smoked mice (NS). Inclusion bodies of high density were observed in AM from S. Phagocyte activity of AM was significantly inhibited in S. Production of ROS in AM was significantly increased in S. DNA damage in AM was significantly increased in S.

**Conclusion:**

These results suggest that the inhibition on immunological functions of AM may be due to DNA damage caused by increased ROS with stimulation of appeared internal cell inclusion bodies in AM by smoke exposure. Such immunological inhibitions of AM related with DNA damage by smoking may be increased the risk of micro-organisms infection on lung surgery in patients of smokers.

**Disclosure:** No significant relationships.





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## A SIMPLE AND SAFE METHOD TO PREOPERATIVELY LOCATE THE SMALL PERIPHERAL PULMONARY NODULES UNINVOLVING VISCERAL PLEURA

Hao Wang, M. Feng, Y. Shen, W. Jiang, J. Xi, L. Tan, Q. Wang

*Division of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China*

### Objectives:

In some cases, intraoperative location is quite difficult for the small peripheral pulmonary nodules (SPPNs) which do not involve the visceral pleura. Currently, percutaneous computed tomography (CT) – guided hook-wire placement is the most common method for preoperative location. However, it is sometimes accompanied by complications, such as displacement of hook, or persistent pulmonary air leakage. Here, we report a simple and safe method to preoperatively locate the small peripheral pulmonary nodules uninvolving the visceral pleura.

### Methods:

The indications for this new technique were histologically undiagnosed SPPNs that appeared resectable by thoracoscopic wedge resection. Preoperative CT scans were performed 1 hour before surgery. Under CT guidance, the puncture needle was inserted into the lung tissue until a distance of 3mm to the lesion. Then the medical glue ( $\alpha$ -Cyanoacrylate) was injected to the lung tissue through the needle along with the slow remove of the puncture needle. Immediately, a hard and solid glue stick located just near the SPPN, which was quite easy to be seen and touched when the lung was collapsed during the operation. Subsequently, wedge resection was performed.

### Results:

A total of 22 patients with 27 SPPNs were included in this study. The lesion size was 11.6 (4-21)mm; The distance from the lesion to visceral pleura was 16.5 (6-25)mm. And 14 SPPNs were ground-glass opacity. Wedge resection under VATS was successful in all cases. The post-operative histology diagnosis was primary lung cancer (n=18), metastatic lung cancer (n=4) and benign lesion (n=5). No relevant complications were observed, especially of air leak or bleeding which could be avoided due to the characteristic effect of  $\alpha$ -Cyanoacrylate. Meanwhile, displacement could not occur possibly.

### Conclusion:

CT-guided  $\alpha$ -Cyanoacrylate injection is a simple and easy technique for location of SPPNs when difficulty in recognition is anticipated.

**Disclosure:** No significant relationships.

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**TECHNICAL INNOVATION OF MINIMALLY INVASIVE PECTUS CARINATUM BAR**

Mustafa Yüksel, T. Lacin, N.O. Ermerak, C. Cetinkaya, K. Bostanci

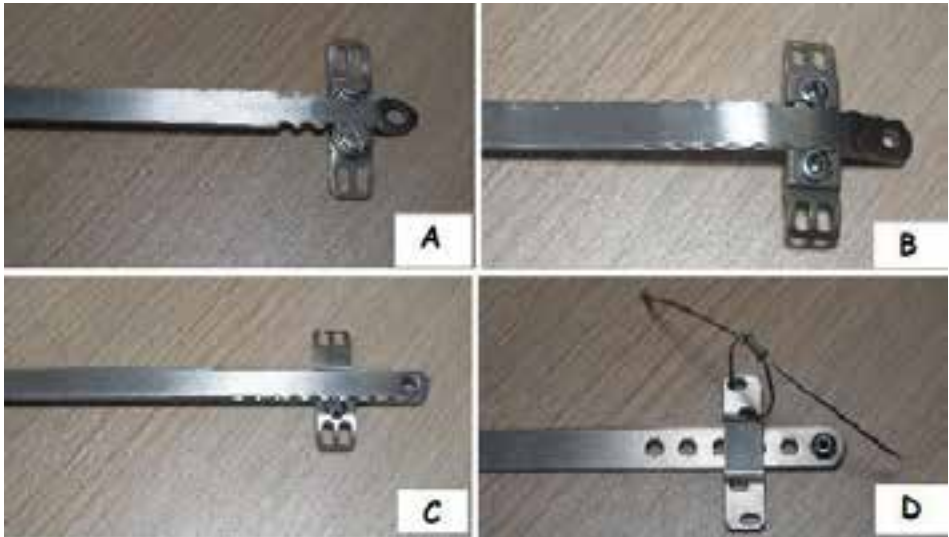
*Thoracic Surgery, Marmara University Hospital, Ustkaynarca/Pendik/Istanbul, Turkey*

**Objectives:**

Pectus carinatum is the second most common congenital deformity of the anterior chest wall. This prospective study focuses on the development of the minimally invasive carinatum bar using our experience in 141 patients.

**Methods:**

141 patients (123M,18F,median age 16.5years) underwent carinatum repair between January 2006 and December 2014. The method included insertion of a nickel-steel bar through midaxillary incisions via creating a tunnel anterior to the sternum and securing the bar to stabilizers on both sides of the chest. The stabilizers were secured subperiostally to ribs using single (n=19) or double-stranded wires (n=58) or sternal cables (n=64). First generation bar with sharp grooves used big screws to secure the stabilizer to the bar. Second generation bar with broad grooves had small pins to secure the stabilizer. It was difficult to align bar and the stabilizers as each pin should face a groove. To overcome this conflict, third generation was invented which had grooves on one side of the tip that a single pin could get inserted into. The fourth generation (n=48) was manufactured with holes along the tips. As the bar slides into the stabilizers while applying manual pressure over the sternum until the desired shape is achieved, clips are placed to the appropriate hole to hold the bar in place (Figure).





**Results:**

Of 141 patients, all except one tolerated the procedure very well. We had to remove the first generation bar in one patient at postoperative month 5 due to intractable pain. Wire breakdown was observed with single- or double-stranded sternal wires (n=9). No wire breakdown but rib-cut (n=2) was observed with sternal cables. Three had skin erosions, 17 had wound infections with the first three generation bars. There was only one infection with the fourth generation bar of 141 patients, 60 patients have undergone bar removal with poor result in only four patients.

**Conclusion:**

Minimally invasive repair of pectus carinatum with our newly designed fourth generation bar is a safe and effective procedure with low morbidity and high patient satisfaction.

**Disclosure:** No significant relationships.

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**PROGNOSTIC FACTORS AND SCORING SYSTEM FOR ACUTE AND CHRONIC PAIN FOLLOWING LOBECTOMY**

Rym Zaimi<sup>1</sup>, P. Bagan<sup>1</sup>, F. Dedominicis<sup>2</sup>, J. Hernigou<sup>1</sup>, B. Dakhil<sup>1</sup>, J. Bardet<sup>1</sup>, A. Fourdrain<sup>2</sup>, P. Berna<sup>2</sup>

<sup>1</sup>*Thoracic and Vascular Surgery, Victor Dupouy Hospital, Argenteuil, France*

<sup>2</sup>*Thoracic Surgery, Amiens Picardie University Hospital, Amiens, France*

**Objectives:**

Pulmonary resections are one of the most painful surgical procedures. Post-operative pain may cause respiratory disorders and affect quality of life. This multi-institutional study aims to determine risk factors and establish a predictive score in acute and chronic pain following lobectomy.

**Methods:**

Patients having lobectomy for a NSCLC and accepting to be followed up for six months were included. Exclusion criteria: previous thoracotomy, thoracic wall invasion, contraindication to intrathecal or paravertebral analgesia, > 24 hours sedation and death within six months. Patients with cN1-N2 cancer had sparing muscle thoracotomy, cN0 patients had a total thoracoscopy. The pain was assessed 3 times a day by visual analog scale (VAS) until release and once at 4 and 24 weeks. VAS>4 defined acute pain, VAS>0 after two months defined chronic pain. Prognostic factors of pain were assessed in both univariate and multivariate analysis. Pre-operative characteristics: age, sex, active smoking, neuropathy, active addiction. Intraoperating characteristics: thoracic approach, operating duration. Post-operative characteristics: fast track rehabilitation, duration of drainage. All the patients were noted from 0 to 10, and divided into three groups according to the scoring system.

**Results:**

133 patients with an average age of 64,2 years were included. Risk factors were neuropathy, active addiction, thoracotomy and absence of rehabilitation in acute pain, and chronic addiction, thoracotomy, absence of rehabilitation and drainage over 5 days in chronic pain. The rates of acute and chronic pain were 15 % and 2 % in the low risk group, 38 and 37 % in the intermediate risk group and 64 and 68 % in the high risk group.

**Conclusion:**

This study identified risk factors of pain after lobectomy. Totally thoracoscopic approach and fast track rehabilitation could have a protective effect. The mode of analgesia could also be suitable to the patient risk, particularly in addictive patients.

**Disclosure:** No significant relationships.



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**SUCCESSFUL USE OF A SPINAL CORD STIMULATOR IN POST THORACOTOMY PAIN SYNDROME**

Naveed Abbas, F. Power, D. O’Keefe, D. Healy

*Department Thoracic Surgery, St Vincent’s University Hospital, Dublin, Ireland***Objectives:**

Post thoracotomy pain syndrome (PTPS) is one of the most common and debilitating complications after thoracic surgery. There have been multiple attempts at alleviating this, however the range of options is as broad as it is unclear. From paracetamol, topical local anaesthetic agents to transcutaneous electrical nerve stimulation (TENS), the results are variable. Here we describe a case where the use of a spinal cord stimulator lead to the reduction of a chronic and refractory chest pain following thoracotomy.

**Case description:**

A 56 year old male was referred to the Thoracic Surgical Clinic with chronic left-sided chest and left upper quadrant pain for the past 15 months. The pain was in the T6-7 distribution and did not cross the midline, but was severely debilitating at times with no periods of complete relief. The pain followed a left thoracotomy for a “spontaneous left diaphragmatic rupture” whilst abroad on holidays. He previously had an open cholecystectomy and appendicectomy; as well as bilateral first rib resection for thoracic inlet syndrome in 1998. Physical examination did not reveal in physical deformities or any perceived difference in sensation. Repeated investigations including radiology and endoscopy revealed the presence of a raised left hemi-diaphragm, but no other cause of the pain was identified. A diagnosis of PTPS was made and he was referred on to the chronic pain control team at the hospital. Multiple modalities of pain relief were trialled, including neuropathic pain agents and topical anaesthetic agents; with mixed results. Also suffered from liver toxicity from excess pain medication. Following these attempts, a high-frequency (10 kHz) SCS was used with excellent results. On present follow up, pain and analgesic requirements are greatly reduced with improved quality of life.

**Conclusions:**

Spinal cord stimulation appears to be an effective option in reducing refractory pain secondary to PTPS in selected patients.

**Disclosure:** No significant relationships.

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**KIKUCHI FUJIMOTO DISEASE MIMICKING THYMOMA – CASE PRESENTATION**

Piotr Blasiak<sup>1</sup>, M. Jelen<sup>2</sup>, A. Rzechonek<sup>1</sup>, J. Cianciara<sup>1</sup>, J. Kolodziej<sup>1</sup>,  
B. Muszczynska-Bernhard<sup>3</sup>

<sup>1</sup>Thoracic Surgery Center, Lower Silesian Lung Diseases Center, Wroclaw, Poland

<sup>2</sup>Division of Pathomorphology and Oncological Cytology, Wroclaw Medical University, Wroclaw, Poland

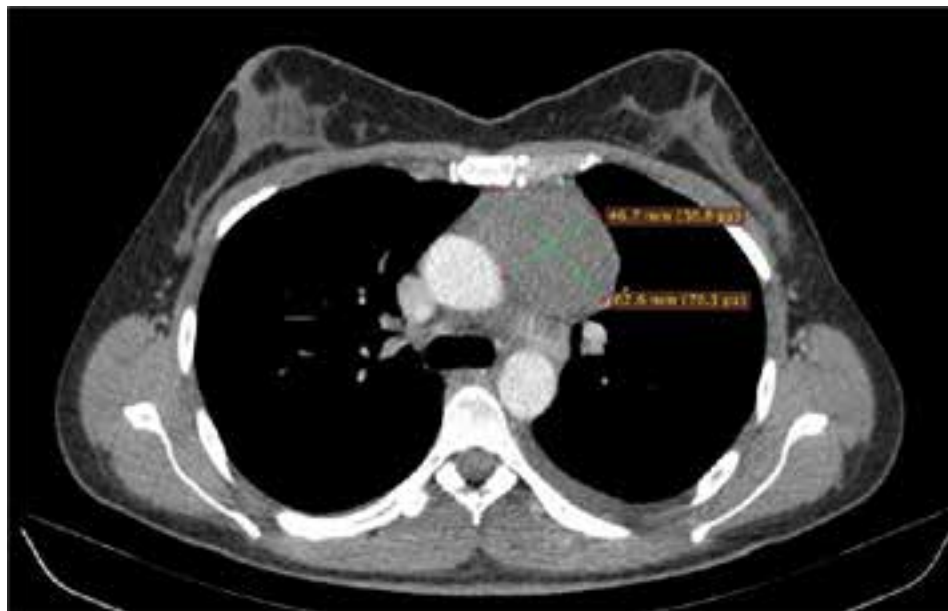
<sup>3</sup>Department of Pathology, Lower Silesian Lung Diseases Center, Wroclaw, Poland

**Objectives:**

We presented the case of 37-year-old woman suffering from a rare self-limiting Kikuchi-Fujimoto disease. It rarely occurs within the mediastinum therefore usually it is not taken into consideration in the differential diagnosis. The etiology is unknown. We analysed this case, diagnostic and therapeutic process and we put forward the conclusions to other thoracic surgeons, pulmonologists and pathologists that will diagnose this sort of mediastinal tumors.

**Case description:**

37-year-old female with symptoms of weakness, malaise, with recurrent headaches, drowsiness came to our department of thoracic surgery for diagnosis and treatment of mediastinal tumor (Image 1)





In computed tomography the diameter of the tumor was 62.6 mm. The consulting neurologist suspected thymoma. The patient was qualified for surgery. In general anesthesia we performed left videothoracoscopy and we resected mediastinal tumor. There were no infiltration of the surrounding tissues. The postoperative course without any complication and the patient was discharged from our hospital. Histopathologist diagnosed the Kikuchi-Fujimoto disease. After two months of treatment there were no adverse events. Patient is still under control. Due to the self-limiting nature of the disease the patient does not require any continuation of treatment.

**Conclusions:**

This case realizes how important is the cooperation between the pathologist and the surgeon. The clinical course of the disease, patient' symptoms should be known to both. The diagnosis can be confirmed both by clinical and histopathological features of the disease. In the case of mediastinal tumor that is suspected of thymoma the Kikuchi-Fujimoto disease should be taken into account. It does not change the procedure. To identify histiocytic, necrotizing lymphadenitis without granulocytic infiltration (other name of KF disease) lymph node must be resected in its entirety.

**Disclosure:** No significant relationships.

**P-282****INTRAPERICARDIAL HAMARTOMA LIKE A PRIMITIVE HEART**Bassam Darwish*Thoracic Surgery Department, Almuoussat University Hospital, Damascus, Syria***Objectives:**

Report an Intrapericardial hamartoma as mediastinal mass. Is the cardiopulmonary machine needed?

**Case description:**

A 65 year-old female presented with dyspnea, referred from a cardiologist because a mediastinal shadow. On clinical examination: pulse 65/min. blood pressure 140/80 mm Hg. Other clinical examination of the cardiovascular and respiratory system was unremarkable. Chest X-ray: mediastinal shadow at right heart border. Chest CT-Scan revealed a mediastinal mass, appeared unhomogenous with clear borders, located at the right heart wall, compressing right atrium with no invasion. A right thoracotomy through 5<sup>th</sup> intercostal space revealed an intrapericardial solid 8X4 cm mass, adhered to the lower part of the superior vena cava and upper part of right atrium wall with no invasion. With stand by of cardiopulmonary machine, the mass could be easily dissected from the pericardium and with delicate dissection it could be also separated from the superior vena cava and right atrium with a safety margin, without machine connection. Instant cross-section showed two cavities surrounded by thick tissue. It appeared like a primitive heart. Mass histopathological examination revealed connective tissue as hamartoma. A part from transitional atrial fibrillation. Patient had uneventful recovery. A short intraoperative video will be presented.





Chest CT- Scan: Unhomogeneous mediastinal mass.  
The mass with two cavities surrounded by thick tissue like a primitive heart.

**Conclusions:**

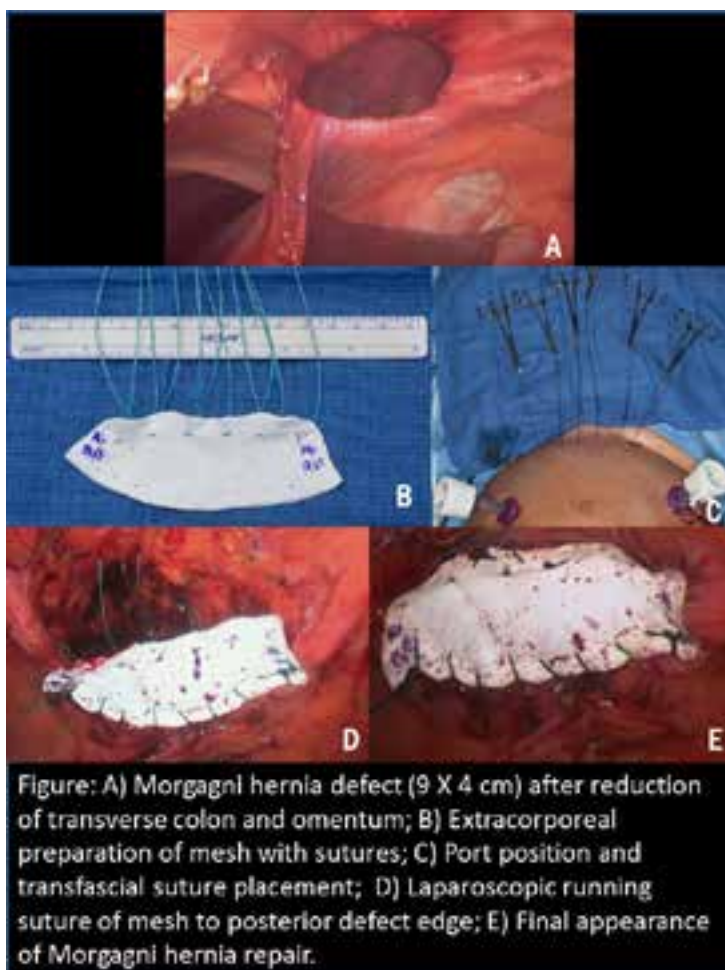
Intrapericardial hamartoma represent a very rare cause of an intrathoracic mass. The extracardiac lesion is easy to remove. But the cardiopulmonary machine must be stand by. This hamartoma unusual appeared as a primitive heart.

**Disclosure:** No significant relationships.

P-283

**LAPAROSCOPIC REPAIR OF MORGAGNI HERNIA: A NOVEL TECHNIQUE FOR MESH FIXATION**Karen J Dickinson, P.G. Rowse, S.D. Cassivi*Division of General Thoracic Surgery, Mayo Clinic, Rochester, United States of America***Objectives:**

To describe a novel technique for mesh fixation during laparoscopic Morgagni hernia repair.

**Case description:**

A 68 year old woman presented with symptoms of upper abdominal pain. Subsequent investigation diagnosed a large Morgagni hernia. She was taken to the operating room for laparoscopic repair. A three port technique in the semi-lithotomy position was used. On inspection of the peritoneal cavity, an anterior diaphragmatic defect (9x4cm) was observed (figure A). The contents (transverse colon and omentum) were reduced and the falciform ligament divided to enable adequate access for repair. The hernial aperture was dissected, the sac reduced and completely excised extrapleurally. It was not possible to achieve a tension-free primary closure; our preferred option. A 2mm thick Gore Dualmesh bioprosthesis (W.L Gore Associates, Flagstaff, Arizona) was tailored to the appropriate size to repair the defect. There are anatomic and ergonomic challenges inherent in the suture repair of the anterior portion of a Morgagni hernia defect. A novel hybrid approach was chosen for this repair in order to facilitate and ensure the strength of the anterior repair. Interrupted 0-ethibond (ethylene terephthalate) sutures were placed along the anterior border of the mesh prior to introduction into the peritoneal cavity (figure B). These paired sutures were passed, each strand separately, through the abdominal wall via 2mm skin incisions using a standard percutaneous transfascial suture device (figure C). The inferior border of the mesh was sutured intracorporeally in a running fashion to the posterior aspect of the defect using similar 0-ethibond suture. The interrupted sutures were secured last, after the pneumoperitoneum had been reduced to 8 mmHg (figure D/E).

**Conclusions:**

We describe a novel minimally invasive technique for mesh fixation using transfascial sutures to secure the mesh in a Morgagni hernia repair. This technique simplifies the often challenging anterior component and ensures a secure and tension-free repair.

**Disclosure:** No significant relationships.

P-284

**TREATMENT OF AN ENDOBRONCHIAL GRANULAR CELL TUMOUR WITH ONE-STOMA-TYPE BRONCHOPLASTY INCLUSIVE OF SECOND CARINOPLASTY**

Hironori Ishibashi, Y. Nakashima, S. Baba, C. Takasaki, M. Kobayashi, K. Okubo  
*Thoracic Surgery, Tokyo Medical and Dental University, University Hospital of Medicine,  
Tokyo, Japan*

**Objectives:**

Right second carinal resection to preserve parenchymal lung tissue is a particularly challenging procedure as it involves additional resection of the bronchial sleeve or sleeve lobectomy. We performed a resection of the right upper bronchus and the second carina, which was invaded by an endobronchial mass. Despite the size discrepancy between proximal stoma and the right upper bronchus, end-to-side anastomosis between the remnant distal portion of the right upper bronchus and the stoma of the right main bronchus was successfully completed.

**Case description:**

A 37-year-old woman presented with back pain. A chest CT scan revealed a 7mm endobronchial tumour obstructing the right upper lobe bronchus. Bronchoscopy confirmed an endobronchial tumour arising from the membrane near the second carina and resulting in obstruction of the right upper lobe orifice (Fig 1). A biopsy was not performed due to bleeding. A right posterolateral thoracotomy via the 4<sup>th</sup> intercostal space was performed, followed by dissection of the right main, right intermediate and right upper lobar bronchi free from adjacent structures. The distal right upper bronchus was transected from the right upper bronchus to achieve a safe margin. The endobronchial tumour was diagnosed as a granular cell tumour by frozen section histology. We decided to perform a limited bronchoplasty procedure and the tumour was excised at its base inclusive of the right second carina. As a result of the size discrepancy between the large oval-shaped proximal stoma (20mm × 10mm) and the distal portion of the right upper bronchus (10mm × 8mm), end-to-side anastomosis was achieved using interrupted 4-0 PDSII sutures (Ethicon Inc., Johnson & Johnson Company, New Brunswick, NJ) without covering cover flap. The postoperative course was uneventful and the patient was discharged on the fifth postoperative day.

**Conclusions:**

One-stoma-type bronchoplasty inclusive of second carinoplasty is a challenging lung-saving procedure due to size discrepancies.

**Disclosure:** No significant relationships.



P-285

**LONG-TERM INDWELLING PLEURAL CATHETER AS AN AMBULATORY TREATMENT FOR RECURRENT PNEUMOTHORACES IN A PATIENT WITH CHRONIC LUNG ALLOGRAFT DYSFUNCTION**

Arthur Kostron<sup>1</sup>, I. Inci<sup>1</sup>, P. Kestenholz<sup>1</sup>, D. Schneider<sup>1</sup>, S. Hillinger<sup>1</sup>, C. Benden<sup>2</sup>, W. Weder<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*

<sup>2</sup>*Division of Pulmonary Medicine, University Hospital Zurich, Zurich, Switzerland*

**Objectives:**

To demonstrate an unconventional management in a patient with chronic lung allograft dysfunction (CLAD) and recurrent pneumothoraxes.

**Case description:**

We report on a 34-year old female who received bilateral lung transplantation for cystic fibrosis in 2008. Four years later, she developed bronchiolitis obliterans syndrome, the most common form of CLAD, and she was on extracorporeal photophoresis as additive therapy. Unfortunately, CLAD progressed, and moreover, she presented with persisting thoracic pain and recurring pneumothoraxes. After placement of two chest tubes, one open and one thoracoscopic revision in the timespan of 3 month, we decided to insert an indwelling pleural catheter (PleurX™ catheter-system) for long-term management. In addition, the patient was listed for re-transplantation due to an overall worsening condition. She learned to handle the indwelling catheter system and to control her symptoms quickly and was able to be discharged home. No infectious or other complication occurred until uneventful re-transplantation 8 month later. The catheter was removed intra-operatively. She remains well without signs of CLAD to date, one year after re-transplantation.

**Conclusions:**

To our knowledge, this is the first case of the use of an indwelling pleural catheter in a patient with CLAD and repeating pneumothoraxes in a long-term ambulatory setting. The use of an indwelling pleural catheter was safe and easy and can be considered even in the immunosuppressed patient in the scenario of recurrent pneumothoraxes.

**Disclosure:** No significant relationships.

**P-286****RECURRENT DESMOID TUMOUR OF THE THORACIC OUTLET SUCCESSFULLY REMOVED THROUGH CERVICOTHORACIC DARTEVELLE'S APPROACH REQUIRING REPLACEMENT OF THE SUBCLAVIAN ARTERY WITH A CRYOPRESERVED ARTERIAL ALLOGRAFT**

M. Paradela De La Morena, D. Sanchez Lorente, M. Boada, C. Izquierdo, J.M. Gimferrer, Laureano Molins

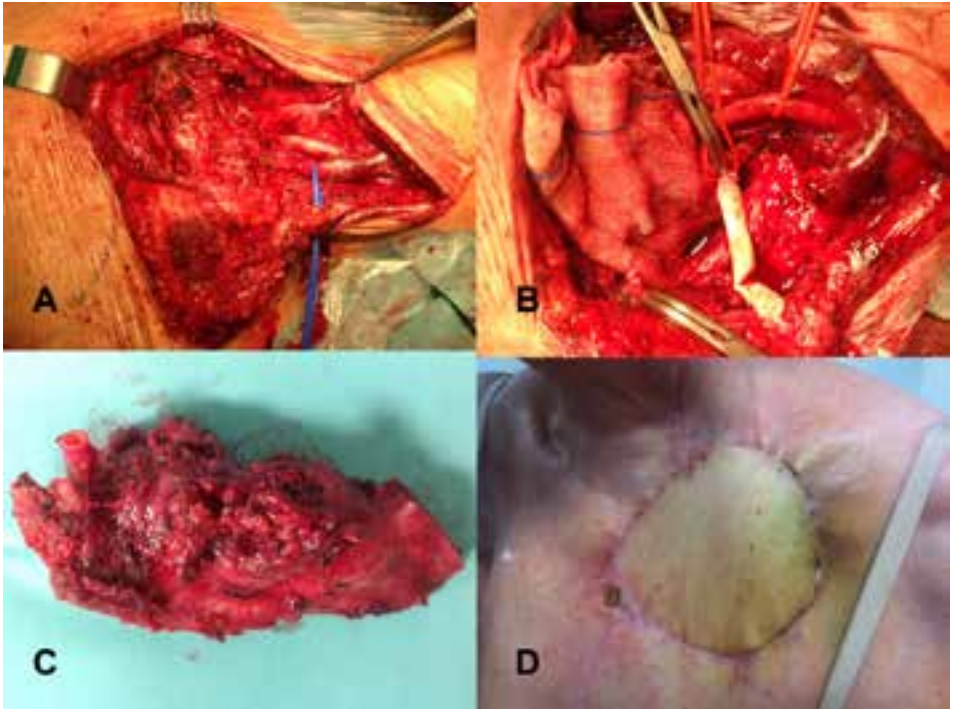
*General Thoracic Surgery Department, Hospital Clinic of Barcelona, Barcelona, Spain*

**Objectives:**

To describe a challenging surgical strategy for a recurrent desmoid tumour of the thoracic outlet.

**Case description:**

A 63-year-old female patient was referred to our thoracic surgical department with the diagnosis of recurrent desmoid tumour in the left supraclavicular region. It was resected incompletely six months ago in another institution. She presented debilitating left arm pain and paresthesias in the first finger of the left hand. MRI demonstrated a masse at the previously resected site measuring 3.2 x 2 x 1.8 cm protruding from the left anterior scalene muscle and a plate osteosynthesis of the left clavicle. Radical resection was performed using the cervicothoracic Darteville's approach. It included partial resection of the left clavicle with osteosynthesis material, first rib and subclavian artery with a cryopreserved arterial allograft replacement. Anterior and superior surgical margin was microscopically positive. Chylothorax occurred on the early postoperative course. It was treated successfully by conservative therapies. Second surgery was required with en bloc resection of the left supraclavicular skin and soft-tissues. Wound closure was performed by pedicle musculocutaneous latissimus dorsi flap. Surgical margin was microscopically negative. At the last 16-month CT-follow up the patient is in a good clinical condition free from disease recurrence.



**Conclusions:**

There is no consensus about the treatment of desmoid tumor. Our case supports the indication of radical surgery as probably one of the best ways to treat this uncommon and aggressive neoplasia.

**Disclosure:** No significant relationships.

P-287

**THE ENDOMEDULLARY FIXATION FOR THE RECURRENT STERNOCLAVICULAR DISLOCATION**

David Perez<sup>1</sup>, J.R. Cano<sup>1</sup>, S. Quevedo<sup>1</sup>, F. Hernández<sup>1</sup>, G. Torrent<sup>2</sup>, A. Peiró<sup>2</sup>, L. López<sup>1</sup>

<sup>1</sup>*Thoracic Surgery, Hospital Universitario Insular de Gran Canaria,*

*Las Palmas de Gran Canaria, Spain,*

<sup>2</sup>*Orthopedic Surgery, Hospital Universitario Insular de Gran Canaria,*

*Las Palmas de Gran Canaria, Spain*

**Objectives:**

Spontaneous refractory anterior sternoclavicular dislocation represents a rare problem faced by orthopedic or general thoracic surgeons. Current reduction and osteosynthesis techniques are associated with a high number of complications that are mainly related to osteosynthesis failure and implant migration. We describe a new surgical technique for the stabilization of this joint, which consists of the guided insertion of a canulated intramedullar screw. It was applied to young patients with anterior spontaneous or posttraumatic sternoclavicular dislocation after failure of conservative measures. Good functional and cosmetic results were obtained.

Spontaneous refractory anterior sternoclavicular dislocation represents a rare problem faced by general thoracic surgeons. Current reduction and osteosynthesis techniques are associated with a high number of complications that are mainly related to osteosynthesis failure and implant migration. Our objective is to describe a new surgical technique for the stabilization of this joint, which consists of the guided insertion of a canulated intramedullar screw.

**Case description:**

The new technique was applied to five young patients with anterior spontaneous or posttraumatic sternoclavicular dislocation after failure of conservative measures. An incision was made at the level of the supraasternal notch and sternoclavicular joint to access the superior mediastinum. The inner table of the sternum and the sternoclavicular joint was bluntly dissected and palpated with a finger so as to ensure correct direction of a threaded guide wire. A guided canulated screw was inserted from the upper edge of the clavicular inflection point deep into the sternal manubrium. Good functional and cosmetic results were obtained.

**Conclusions:**

This new proposed technique, which has never been described in relation with this type of lesion, is safe and allows for a stable joint fixation.

**Disclosure:** No significant relationships.





P-288

**ESOPHAGEAL BYPASS IN PALLIATIVE TREATMENT OF A MALIGNANT BRONCHO-ESOPHAGEAL FISTULA**F. Sollitto<sup>1</sup>, N.P. Ardò<sup>1</sup>, Francesca Tota<sup>1</sup>, F. Cialdella<sup>2</sup>, D. Loizzi<sup>1</sup><sup>1</sup>*Thoracic Surgery, University of Foggia, Foggia, Italy*<sup>2</sup>*Thoracic Surgery, University of Bari, Italy***Objectives:**

Esophageal bypass is an uncommon palliative treatment for advanced esophageal carcinoma. The procedure applied in a malignant esophago-respiratory fistula from lung cancer is described.

**Case description:**

A 55-year old, smoker, female patient, suffering from severe scleroderma, coronary disease and achalasia presented with cough, bronchorrhea, emphysema, weight loss, asthenia, fever, chest pain. Chest X-rays showed a consolidation in the lower part of the right hemithorax. CT scan revealed an irregular pulmonary lesion of about 2.5 cm in maximum diameter allocated in the right lower lobe, a fistula between the right main bronchus, just below the carina, and a significantly enlarged esophagus. Bronchoscopy confirmed the presence of a large esophago-respiratory fistula. Bronchial biopsies revealed a squamous cell carcinoma. The esophagus and airways double stenting was not retained practicable as esophagus was significantly enlarged and the right main bronchus wall presented a huge lack; no stent anchorage was possible. After interrupting oral alimentation, the patient was submitted to thoracotomy for esophagus closure above and below the fistula. Cervical esophagostomy for the drainage of saliva and a feeding jejunostomy were performed. Within ten days the full control of pulmonary bilateral infections and an improvement of general conditions were achieved. Then a second operation was performed for the definitive esophageal bypass. Stomach was mobilized, tubularized and brought through a retrosternal tunnel into the neck where it was anastomized with cervical esophagus. Ten days after the second operation oral feeding was possible. At the six-month follow up the patient is alive, under chemotherapy and refers sporadic emphysema.

**Conclusions:**

Esophageal bypass could be useful for palliative aggressive treatment of esophago-respiratory fistulas not susceptible to other therapeutic options.

**Disclosure:** No significant relationships.

P-289

**THE CHALLENGES OF LUNG TRANSPLANTATION IN A PATIENT WITH KARTAGENER SYNDROME AND SCOLIOSIS**

Alkin Yazicioglu<sup>1</sup>, I.O. Alici<sup>1</sup>, S. Turan<sup>2</sup>, H. Yazicioglu<sup>2</sup>, F. Demirag<sup>3</sup>, N. Karaoglanoglu<sup>1</sup>, E. Yekeler<sup>1</sup>

<sup>1</sup>*Thoracic Surgery and Lung Transplantation Clinic, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

<sup>2</sup>*Anesthesiology, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

<sup>3</sup>*Pathology, Atatürk Chest Disease and Thoracic Surgery Training and Research Hospital, Ankara, Turkey*

**Objectives:**

Kartagener syndrome is a congenital disorder characterized by bronchiectasis, situs-inversus-totalis (dextrocardia) and immotile cilia. Lung transplantation (LuTx) is treatment option for terminal-stage bronchiectasis.

**Case description:**

A-22-year-old female patient with respiratory-insufficiency (FEV1:27%,DLCO:23%, sPAP:50mmHg) was evaluated for LuTx. After acceptance of suitable-donor and under assistance of ECMO single-LuTx (SLuTx) (left) was performed (Ischemic-time: 312min). On right-hemithorax after pneumonectomy, it was surprised that pulmonary artery was severely malpositioned due to dextrocardia and scoliosis. Possible implantation would have resulted in kinking of pulmonary-artery and atrial-cuff. Patient accepted to ICU with peripheral-ECMO for ongoing hemodynamic-instability and to save excess blood from single transplanted lung. She experienced gradeIII-PGD and tracheostomy was performed on 4<sup>th</sup>day. After improvement of lung functions, peripheral-ECMO was weaned on 9<sup>th</sup>day. Two-days later, patient had fever, CO<sub>2</sub> retention and acidosis; so re-ECMO was initiated. Bronchoscopic biopsy revealed organizing-pneumonia and pulse steroid was initiated (1 gr/day, 3 days); 7-days later, graft dysfunction diminished and ECMO was weaned (Totally 17-days ECMO). Extubation was delayed until 40<sup>th</sup>day due to prolonged need for cleaning bronchoscopies. On 42<sup>nd</sup>day, we noticed that orifices of left lung was narrowed. We performed several bronchoscopic balloon



dilatations and accompanying granulation tissue was mechanically removed and managed with high-dose steroids. On 54<sup>th</sup> day, re-tracheostomy was established; however, bronchial narrowing which started from segmental bronchus, affected the entire main and segmental bronchi was diagnosed as vanishing bronchus (VB). As result, patient was died of VB and respiratory insufficiency on 112<sup>th</sup> day.

**Conclusions:**

The condition was found to be related to several enforced factors like SLuTx with a contralateral pneumonectomy and a prolonged ECMO period. Long standing with high levels of ECMO flow may lead to insufficient bronchial nourishment; thus result in VB. More care should be spent on patient selection by the meaning of anatomical aspects of operation procedure. **Figure1 (a):** Pre-operative CT; **(b)** post-operative chest x-ray during PGD; **(c)** post-operative 45<sup>th</sup> day x-ray.

**Disclosure:** No significant relationships.

P-290

**ESOPHAGOGASTRIC ANASTOMOSIS WITH PURSE STRING INSTRUMENT AND PROLONGED ESOPHAGEAL MUCOSA IN A CONSECUTIVE SERIES OF 1140 PATIENTS FOR SURGICAL TREATMENT OF ESOPHAGEAL CARCINOMA TO PREVENT ANASTOMOTIC LEAKING**Shiying Zheng<sup>1</sup>, D. Jiang<sup>1</sup>, B. Chen<sup>2</sup>, K. Wang<sup>2</sup>, Y. Kang<sup>2</sup><sup>1</sup>*Department of Thoracocardiac Surgery, The First Affiliated Hospital of Soochow University, Suzhou, China*<sup>2</sup>*Surgery, Touchstone International Medical Science Co.Ltd., Suzhou, China***Objectives:**

Esophageal anastomotic leaking is the severe complications after the resection of esophageal cancer and cardia cancer. From May 2007 to march 2014, 1140 esophageal and stomach cardia cancer patients treated by intrathoracic esophagogastric anastomosis with purse string instrument and esophageal mucosa extended varied in plane were retrospectively analyzed, there were 4 anastomotic leaking in all cases.

**Methods:**

One thousand one hundred and forty cases were retrospectively analyzed, 862 being male and 278 female from the age of 37-80 years. The patients from 45 to 70 years old accounted for 78.6%. These 1140 cases included 810 patients of middle segment cancer of the esophagus, 210 patients of inferior segment cancer and 120 patients of cardia cancer. In 920 cases of esophageal or cardia cancer the operation was carried through left thoracic cavity. 980 cases were treated by intrathoracic esophagogastric anastomosis (860 anastomosis were done above the aortic arch and 120 cases under the arch). 220 cases of esophageal cancer were treated by tumor-ectomy through right thoracic cavity and esophagogastric anastomosis through intrathoracic cavity. Sometimes, same period 1836 cases bring out a striking contrast (Table 1). Intrathoracic esophagogastric anastomosis with purse string instrument and esophageal mucosa extended varied in plane. Esophagoesophageal anastomosis with purse string instrument and esophageal mucosa extended varied in plane. The main points of the operation are: One more centimeter should be retained on both sides of the esophageal anastomotic stoma. The suture should be carried out under no tension of the stoma.

**Results:**



There were 4 anastomotic leaking postoperatively (Table 1).

<b>Clinical parameters</b>	<b>N=1140</b>	<b>N=1836</b>
<b>Age</b>	<b>67 (39-89)</b>	<b>68(40-91)</b>
<b>Sex (M/F)</b>	<b>862/278</b>	<b>1358/478</b>
<b>Tumor location (mt/lr/gc)</b>	<b>810/210/120</b>	<b>1256/324/156</b>
<b>Clinical stage (I/II/III/IV)</b>	<b>89/823/205/23</b>	<b>109/1452/223/52</b>
<b>Harvested lymph nodes</b>	<b>54.8 (37-98)</b>	<b>56(40-97)</b>
<b>Complication</b>	<b>46 (4.03 %)</b>	<b>137(7.46%)</b>
<b>Anastomotic leakage</b>	<b>4</b>	<b>43</b>
<b>Mortality</b>	<b>1(0.09 %)</b>	<b>7(0.39%)</b>
<b>Length of hospital stay (days)</b>	<b>11d (9-92)</b>	<b>12d(9-118)</b>

**Conclusion:**

Prolonged esophageal mucosa prevent back contract of esophageal mucosa. The purse string instrument and esophageal mucosa extended anastomosis we used could prevent the anastomotic leaking effectively.

**Disclosure:** No significant relationships.

P-291

**ESOPHAGEAL PERFORATION FOLLOWING ANTERIOR CERVICAL SPINE FIXATION. MANAGEMENT AND RESULTS**

Niccolò Daddi<sup>1</sup>, O. Perrone<sup>2</sup>, M. Lugaresi<sup>2</sup>, I. Borghesi<sup>3</sup>, G.P. Belloni<sup>4</sup>, M. Uneddu<sup>4</sup>, S. Mattioli<sup>2</sup>

<sup>1</sup>*Medical and Surgical Sciences, University of Bologna, Bologna, Italy*

<sup>2</sup>*Division of Thoracic Surgery GVM Care & Research, University of Bologna, Bologna, Italy*

<sup>3</sup>*Division of Neurosurgery, GVM Care & Research, Cotignola, Italy*

<sup>4</sup>*Department of Rehabilitation, Montecatone Rehabilitation Institute, Imola, Italy*

**Objectives:**

Delayed pharyngoesophageal perforation is a rare and fairly unknown complication of anterior cervical spine fixation (ACDF). A survey of the Cervical Spine Research Society reported an overall 0.25% perforation rate. Optimal treatment remains argued. A retrospective review of our personal case series was collected.

**Methods:**

Thirteen cases of esophageal perforation related to ACDF procedure were observed in the period 2004-2014. ACDF had been carried out at C4-C7 level. Common symptoms were facial, neck swelling or persistent pain, dysphagia hyperpyrexia, clinical evidence of abscess or cutaneous salivary fistula. Mean delay in symptoms acme was 24 days (range 12 days-9 years). CT scan  $\pm$  gastrografin was the preferred preop. Test to investigate the neck soft tissues and the fixation devices status.

**Results:**

All patients had tracheostomy. Primary treatment was lateral neck drainage and percutaneous gastrostomy, broad-spectrum antibiotics .3 patients with minor infection and small fistula not adjacent to fixation devices were managed conservatively. 10 patients (in 2 cases perforation was intraoperative, in 8 cases it was due to screw decubitus) were surgically managed: 1) adequate preop spine stabilisation 2) lateral cervicotomy, 3) wide pharynx and proximal esophagus mobilization, 4) clearing of the mucosal tear margins, 4) double-layer suture of the fistula, 5) muscular flap reinforcement (with sternocleidomastoid muscle in 8 cases, with pectoralis major muscle in 2. Mean length of stay was 24.1 days (range 10-61). No operative mortality occurred. Major comorbidities were chronic respiratory failure (n=7), infective status (n=6) and arterial hypertension (n=2).

**Conclusion:**

Neck drainage to protect tracheostomy and treat infection are mandatory. Enteral nutrition promotes a favorable outcome. For large fistulas spine stabilization, screw devices removal and repair with blanket muscular flap are recommended.

**Disclosure:** No significant relationships.



P-292

## ON THE SURGICAL REPAIR OF CERVICAL BENIGN TRACHEO-ESOPHAGEAL OR PHARYNGEAL FISTULA IN TETRAPARETIC PATIENTS UNDER MECHANICAL VENTILATION

Niccolò Daddi<sup>1</sup>, V. Tassi<sup>1</sup>, M. Lugaresi<sup>2</sup>, G.P. Belloni<sup>3</sup>, M. Conte<sup>4</sup>, S. Mattioli<sup>1</sup>

<sup>1</sup>*Department of Medical and Surgical Sciences, University of Bologna, Bologna, Italy*

<sup>2</sup>*Division of Thoracic Surgery GVM Care & Research, University of Bologna, Bologna, Italy*

<sup>3</sup>*Department of Rehabilitation, Montecatone Rehabilitation Institute, Imola, Italy*

<sup>4</sup>*Division of Intensive Care and Anesthesia, Montecatone Rehabilitation Institute, Imola, Italy*

### Objectives:

Acquired cervical benign tracheo-esophageal or pharyngeal fistulas (BTE/PF) in patients who cannot be weaned from mechanical ventilation because of neurological co morbidities do represent a highly demanding clinical problem. Conservative therapy is encumbered with high mortality rate (80%) related to aspiration and pulmonary sepsis, while it is commonly agreed that surgical therapy may offer excellent short-term and long-term results but only on patients off artificial ventilation.

### Methods:

From March to August 2014, three tetraparetic patients from neurological accidents and on intermittent or continuous artificial ventilation were successfully managed with a sub cricoid resection and the direct repair of the digestive fistula. Ventilation was provided by a silicon T tube inserted through a tracheostomy performed below the cricoid-tracheal suture line in 2 cases and in the anterior aspect of the anastomosis in the third case. The prosthesis was placed across the airway suture line, with the upper branch below the vocal cords and the lower end in the distal trachea. This device is a modified silicone Montgomery T-tube with an inflatable internal balloon at the upper end. Balloon inflation provides closure of the upper limb and allows mechanical ventilation, while balloon deflation restores upper respiratory access. Preoperative assessment of the site and extension of the fistula were evaluated by bronchoscopy and CT scan. The airway resection at the cricoid level was performed according to the Pearson's technique while the esophageal repair was performed according to Grillo.

### Results:

All patients survived surgery without recurrent nerves palsy. They resumed spontaneous ventilation after a minimum weaning time of 17 days. At follow-up (median 4 months, range 1-6), BTE/PF was healed and airways were patent in all three patients.

### Conclusion:

Our recent experience encourages the direct surgical repair of BTE/PF, by using a cuffed silicone T prosthesis that allows postoperative mechanical ventilation, while protecting the airway anastomosis.

**Disclosure:** No significant relationships.

**P-293****SURGICAL TREATMENT OF BOERHAAVE'S SYNDROME USING ECHELON FLEX POWERED ENDOPATH STAPLER**Dongwon Kim*Thoracic and Cardiovascular Surgery, Inje University Sanggye Paik Hospital, Seoul, Korea***Objectives:**

Boerhaave's syndrome is a very fatal condition occurring esophageal rupture during emesis and has the worst prognosis of the esophageal perforation.

**Methods:**

From February 2014 to January 2015 5 patients underwent surgical treatment for Boerhaave's syndrome using Echelon Flex Powered Endopath 60 mm Stapler at Inje University Sanggye Paik Hospital, Seoul, Korea. There were 5 males whose mean age was 50.3 years ranging from 47 to 60. Surgery was performed under one lung anesthesia with right decubitus position. The left lateral utility incision was made and 5<sup>th</sup> ICS (Intercostal space) was approached with two trocar insertion at the 7<sup>th</sup> ICS anterior and posterior axillary line.

**Results:**

Mean operation time was 91.7 minutes and there was no leakage after surgery. Post-operative complication was one operative wound infection and one post-operative bleeding which was treated completely.

**Conclusion:**

Surgical treatment for Boerhaave's syndrome using Echelon Flex Powered Endopath Stapler is simple and effective technique but further studies with large number of cases should be carried out for better outcome.

**Disclosure:** No significant relationships.





P-294

**BENEFIT OF COMPUTERIZED TOMOGRAPHY SCAN WITH INTRAVENOUS CONTRAST PRIOR TO ESOPHAGECTOMY IN PATIENTS WITH ESOPHAGEAL CANCER**T. Gunn<sup>1</sup>, K. Parekh<sup>2</sup>, J. Speicher<sup>3</sup>, J. Tcheng<sup>2</sup>, N. Rossi<sup>2</sup>, M. Iannettoni<sup>4</sup><sup>1</sup>*Cardiothoracic Surgery, University of Kentucky, Lexington, United States of America*<sup>2</sup>*Cardiothoracic Surgery, University of Iowa, Iowa City, United States of America*<sup>3</sup>*General, Thoracic, And Vascular Surgery, Virginia Mason Medical Center, Seattle, United States of America*<sup>4</sup>*Department Of Cardiovascular Sciences, East Carolina Heart Institute, Greenville, United States of America***Objectives:**

To evaluate the diagnostic value and financial benefit of a CT scan with intravenous contrast (c-CT) in addition to the current standard of a noncontrast integrated CT/positron emission tomography (CT-PET) scan in patients with esophageal carcinoma undergoing evaluation for esophagectomy.

**Methods:**

We retrospectively evaluated 128 consecutive patients from 2009-2013 with esophageal cancer that were evaluated for surgical treatment, of which 110 (85.9%) had undergone a preoperative c-CT. The median age was 62 and 15.5% were female. Adenocarcinoma accounted for 82.8%; 90.6% of tumors were distal; and 73.4% of patients had undergone neoadjuvant chemoradiation.

**Results:**

Mortality was 2.5% (3 patients). Of the 110 patients with c-CTs, 3 patients (2.7%) had massive preoperative pulmonary emboli identified, all of whom were asymptomatic and 1 patient (0.9%) had metastasis to the liver on c-CT scan that was not seen on CT-PET. Of those patients who had both c-CT and CT-PET, there were 7 cases (6.5%) that were determined to be inoperable prior to surgery and 7 (6.5%) that were determined to be unresectable at the time of surgery; however, only one patient had evidence of metastases on c-CT that was not supported by CT-PET. Based on c-CT findings alone, 2 cases (1.6%) were delayed due to pulmonary embolism (PE) and 1 esophagectomy (0.8%) was canceled due to metastasis. The combined cost of negative c-CT scans for every unique and positive scan was \$88,600.

**Conclusion:**

There appears to be no cost effective benefit in obtaining a c-CT prior to surgical intervention over CT-PET alone. However, performing an esophagectomy on the three patients in this study with massive PE would have likely increased the overall mortality. While not financially indicated, the modest but tangible diagnostic benefits of an additional c-CT continues to force health care providers to evaluate the balance between financial consideration and its implications for patient outcomes.

**Disclosure:** All authors have declared no conflicts of interest.

**MONDAY, 1 JUNE 2015**

**09:40 - 17:15**

**NURSE SYMPOSIUM - ORAL**

**N-295**

**LESIONS DUE TO SURGICAL POSITIONING IN PULMONARY TRANSPLANT**

Dario Antunes, A. Afonso, S. Ruivo, S. Vieira, J. Ricardo  
*Hospital Santa Marta, Lisbon, Portugal*

**Objectives:**

To benchmark our center's reality regarding to lesions due to surgical positioning in patients submitted to pulmonary transplant. To decrease the incidence of the identified complications.

**Methods:**

Retrospective study of patients submitted to pulmonary transplant between 2008 and 2014. Based on institutional platforms, lesions due to surgical procedure we're investigated. Those lesions we're grouped according they're type and analyzed they're relevance towards the 105 patients transplanted.

**Results:**

The more common lesions observed we're musculoskeletal lesions as well as skin integrity lesions. Among them, the more significant were shoulder lesions with a predominance of 2%, arm lesions also with 2% and ankle lesions as well with 2%.

**Conclusions:**

Benchmark was not possible because of absence of publications with the same study object. Although its prevalence, the significance of lesions found out is low. Nevertheless, new strategies were defined to increase results, such as multidisciplinary meetings and specific material purchase, in aim to accurate the surgical positioning.

**Disclosure:** No significant relationships.



N-296

## LUNG TRANSPLANT CENTER: EDUCATIONAL PROGRAM RESULTS

A. Mansoa, D. Lopes, M. Rodrigues, Miguel Venda

*Cardiothoracic Surgery, Uci, Hospital de Santa Marta, Lisbon, Portugal*

### Objectives:

To describe the educational program developed by the lung transplant department of a cardiothoracic surgery center presenting its results.

### Methods:

With this study we pretend to understand the results of our educational program on the knowledge and skills of lung transplant patients. We intend to develop a qualitative research, through a descriptive approach based on the patients admitted between December 2014 and May 2015.

### Results:

The process of health education in the post-operative period, of a patient submitted to a pulmonary transplant, equally involves his family, and targets that they can assume responsibility for their self-care, in order to achieve greatest autonomy possible and improve their quality of life. The study is still undergoing, but results are expected to show which subject patients reveal to be more difficult to assimilate or achieve.

### Conclusions:

The lung transplant can return dignity and quality of life to the patients and their families, allowing them still be an active member of society (Tavares, 2004; Phipps, Sands & Marek, 2003). We hope that the study allows us to understand the knowledge that the patients and their families have the most difficulty to assimilate and equally what are the capabilities and skills (that they will have to perform), that they have the most difficulty to execute. That way it will be possible to identify the items and the steps in the program for health education that need to be rephrased as well as to find new strategies to promote a quicker and easier acquisition of skills, by the patient and their families.

**Disclosure:** No significant relationships.

N-297

**THE INTERVENTION OF PHYSICAL THERAPY IN THE CONTEXT OF THORACIC SURGERY: A RETROSPECTIVE ANALYSIS AT HOSPITAL DE SANTA MARTA**

Maria Carmo Blanc, B. Rodrigues, J. Ricardo Costa, M.D.C. Barros, C. Gavinho, C. Correia, C. Jacinto

*Serviço de Medicina Física e Reabilitação, Hospital de Santa Marta, Lisbon, Portugal*

**Objectives:**

Physiotherapy is considered an essential component of the management of patients after thoracic surgery. In Hospital de Santa Marta the physical therapist takes part in the multidisciplinary team since ages. The aim of the presentation was to report/describe the current physiotherapy management of patients undergoing thoracic surgery. Starting in the pre-operative stage, passing through the immediate post-operative and following this last stage until discharge. As a secondary objective we will demonstrate some of our results in this last stage.

**Methods:**

Description of the goals and timings of physiotherapy in the different stages of recovery. Observational study with a retrospective and descriptive approach with an analysis of the results collected in the database, recorded by the responsible physiotherapist at post-discharge program.

**Results:**

40 patients undergoing lung transplantation between 2000 and 2012 who underwent the specific physiotherapy program post surgery and were evaluated in the walk test, FEV1 and functionality. Statistical evidence were found.

**Conclusions:**

In 2014 the Hospital reached the milestone of 100 lung transplant. Physical therapy has played an important role in the rehabilitation of these until the time of return to the domicile. Here are the results achieved with the physical therapy program developed specifically for this population.

**Disclosure:** No significant relationships.

N-298

**ACCESSING THE INFLUENCE OF ELECTRICAL ACUPUNCTURE STIMULATION ON SELF-REPORTED ANXIETY IN PERIOPERATIVE CARE AMONG PATIENTS WITH PULMONARY LOBECTOMY**

Lili Hou, Y. Hu, F. Gu

*Nursing Department, Shanghai Pulmonary Hospital, Shanghai, China***Objectives:**

The study aimed to assess the influence of electrical acupuncture stimulation on self-reported anxiety in perioperative care among patients with pulmonary lobectomy.

**Methods:**

A total 62 patients with pulmonary lobectomy were randomly assigned to three groups from December 2013 to May 2014. Group A (n = 21) received standardized perioperative care and electric acupuncture stimulation, from which Zusanli, Sanyinjiao and Hegu acupoints were applied. Group B (n = 20) received standardized perioperative care and muscle stimulation by needling a nearby nonacupoint. Controlled group (n = 21) received standardized perioperative care. The patients maintained their assigned acupuncture stimulation in 7 days (2 days before surgery and 5 days after surgery). The frequency of stimulation was every day and lasted 20 minutes each time. Self-Rating Anxiety Scale (SAS) was used and statistical analysis for T-test was conducted in this study.

**Results:**

SAS was evaluated in three groups before and after stimulation intervention. The mean SAS scores in Group A before and after were  $34.64 \pm 5.85$  vs.  $28.21 \pm 1.75$ , ( $p=0.022$ ), which was statistically significant. On the other hand, there were no significant differences of SAS scores in Group B and Group C before and after stimulation intervention in perioperative care ( $37.99 \pm 5.98$  vs.  $37.10 \pm 0.56$ ,  $p=0.142$ ;  $33.75 \pm 4.89$  vs.  $33.04 \pm 5.86$ ,  $p=0.605$ , representatively).

Variable	BEFORE	AFTER	P-value
Group A n=21	$34.64 \pm 5.85$	$28.21 \pm 1.75$	0.022
Group B n=20	$37.99 \pm 5.98$	$37.10 \pm 0.56$	0.142
Group C n=21	$33.75 \pm 4.89$	$33.04 \pm 5.86$	0.605

**Conclusions:**

Electric acupuncture stimulation could reduce the anxiety of patients, promote rehabilitation and increase the quality of life among patients with pulmonary lobectomy.

**Disclosure:** No significant relationships.

N-299

**EFFICACY OF NEUROMUSCULAR TAPING IN PAIN MANAGEMENT FOLLOWING THORACIC SURGERY**Giovanna Rubino<sup>1</sup>, S. Montaldo<sup>1</sup>, M. Tosi<sup>1</sup>, E. Ruffini<sup>2</sup>, A. Oliaro<sup>2</sup><sup>1</sup>*AOU Città della Salute e della Scienza, Turin, Italy*<sup>2</sup>*Thoracic Surgery, University of Turin, Turin, Italy***Objectives:**

Thoracotomy induces severe postoperative pain. Currently, medication is the most used treatment. Recent studies showed the effectiveness of Neuromuscular Taping (NMT) in the pain treatment of sports injuries. However, there is not enough evidence on the treatment of postoperative pain with this therapy. The objective is to evaluate the effectiveness of NMT to reduce pain after thoracotomy and consequently to reduce the need of analgesics.

**Methods:**

Patients presenting persistent pain related to surgical wound at least 1 month post-surgery after hospital discharge participated in the study. Inclusion criteria: patients undergoing thoracotomy, noncomplicated surgical wound and high post-operative pain evaluated by the Borg modified rating scale (Borg  $\geq$  3-4). Exclusion criteria: presence of associated neuropathies, diabetes, drug addiction of various kinds, and patches allergy. NMT, having a similar elasticity and thickness to human skin, is used to create a lifting effect on the epidermis. It's applied on the muscles in different forms: single piece, X, Y or fan. The patch is used from the beginning to end of the muscle. The evaluation was performed once a week after the patch application.

**Results:**

Ten patients were evaluated. Borg scale for pain was progressively reduced from  $5.4 \pm 1.9$  to  $1.70 \pm 1.77$  ( $p < 0.05$ ). Weeks required for pain reduction were  $2.6 \pm 1.6$ . One patient left the treatment after the first evaluation without pain improvement; even if included in the study. The maximum follow-up was 6 weeks. All patients reduced analgesics dosage, 5 of them stopped analgesics at the end of the treatment.

**Conclusions:**

Neuromuscular Taping seems to have a positive effect to reduce pain after thoracotomy. During the progression of the treatment, there was a direct relationship between pain reduction and lower use of high doses of pain-killer medications. Further studies would be required to confirm the present results.

**Disclosure:** No significant relationships.



N-300

**EPIDURAL CATHETER: A WAY TO PAIN CONTROL IN THORACIC SURGERY. A RETROSPECTIVE STUDY**

G. Bisegna, Enrica Borla, F. Filimon, P. Garrone, S. Giacalone, V.L. La Rosa, A. Marziali, M. Ruzza

*Thoracic Surgery, AOU Città della Salute e della Scienza, Turin, Italy*

**Objectives:**

Pain is "...Anything that the person who tries it says it is..." (WHO, 2006). In thoracic surgery pain intensity is essentially linked to engraving tissue resulting in muscle and nervous damage. The literature shows that the best strategy for pain control, it's represented by a combined administration of local anesthetics and opioids through an epidural catheter. Adequate pain control should allow postoperatively patient's mobilization, reducing risk of complications and improving patient's compliance and quality of life. Based on these assumptions, in our reality, we expect the placement of epidural catheter in every thoracotomy, in absence of patient's comorbidities. The aim of this work is to present what we observed about patient's pain control and their levels of autonomy, postoperatively.

**Methods:**

Retrospective observational study included medical records of patients undergoing thoracotomy from December 2013 to October 2014. Inclusion and exclusion criteria were defined and anonymity of patients was guaranteed.

**Results:**

120 medical records were consulted. Pain was evaluated through VAS scale and levels of patient autonomy by ADL scale. Epidural catheter was placed in 100 patients. In this group 89 obtained effective control of pain postoperatively (VAS < 3). 11 needed supplemental analgesia in second day. Mobilization took place in the first day for 96 patients and total autonomy (ADL = 6) on third. The observed average hospital stay was 8.6 days. In the group (20 patients) with intravenous analgesia, pain was in good compensation in 14 cases. Mobilization took place in the first day for 16 patients, while total autonomy on fourth. The mean hospital stay was 9.6 days.

**Conclusions:**

Use of epidural catheter appears to be satisfactory for pain control with benefits on the comfort and quality of patient's life, according with literature.

**Disclosure:** No significant relationships.

**N-301****STANDARDISATION OF TEACHING ABOUT PAIN TO THE PATIENT  
SUBMITTED TO THORACIC SURGERY**Vanda Camara*CHLN, Lisbon, Portugal***Objectives:**

Our project has the overall objective to “Structure and standardize teaching about the pain to the patient undergoing thoracic surgery”.

**Methods:**

Patients will be given the opportunity to place questions and talk about their fears. Moreover, they will be informed of teams prepared to talk to them. This will hopefully motivate patients to experience pain without trauma, with confidence in the team and the applied method. To achieve this result, there will be nursing teams with professionals from the three different hospital services which currently work on the Operating Services. These are the *Pre-Operative Nursing Center* (anesthesia consultation), the Thoracic Surgery Service, and the Operating Room. It is through the link of these services that we will be able to standardize and structure the teaching about thoracic surgery to the patients. The first contact of the patient with the team will be in the nursing consultation. At this initial stage, it is intended that the patient will start receiving information about the pain which is related to the surgical procedure. Besides this issue, it will also be addressed the surgical route, the type of surgery to perform. Information devices will be presented in order to clarify frequently asked questions and contribute to decrease the anxiety levels of the patients.

**Results:**

The second and third contacts with the nursing teams involved in this process will be, respectively, the Thoracic Surgery Service and the Operating Room. In these two events, the teaching will be reinforced and validated. From this connection, it will result an increase in the capability of the patient for self evaluation. Moreover, it is also intended an increase in the assessment, recording and characterization of pain by the nurses.

**Conclusions:**

Finally, nurses will take the necessary measures, either pharmacological or non-pharmacological, to ensure that the concept “Hospital without Pain” becomes a reality.

**Disclosure:** No significant relationships.



N-302

## THE MEASURES OF INTRAOPERATIVE TEMPERATURE CONTROL MIGHT REDUCE POSTOPERATIVE SYSTEMIC INFLAMMATION IN MINIMALLY INVASIVE ESOPHAGECTOMY: A COMPARATIVE STUDY

Hao Wang<sup>1</sup>, Q. Zhu<sup>2</sup>, F. Fang<sup>3</sup>, W. Jiang<sup>1</sup>, C. Wang<sup>2</sup>, L. Tan<sup>1</sup>

<sup>1</sup>*Division of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China*

<sup>2</sup>*Department of OR Nurse, Zhongshan Hospital, Fudan University, Shanghai, China*

<sup>3</sup>*Division of Anaesthesiology, Zhongshan Hospital, Fudan University, Shanghai, China*

### Objectives:

Recent advances had suggested that perioperative hypothermia were related with postoperative systemic inflammation. We herein attempted a protocol of intraoperative temperature control measures for the patients who underwent minimally invasive esophagectomy (MIE). The protocol involved the measures of percutaneous body warming systems and warmed intravenous injection fluids during the surgery which was implemented by operation room nurses. The aim of this study was to examine the efficacy of this intraoperative temperature control measures with comparison to conventional care.

### Methods:

A total of 240 consecutive esophageal cancer patients between July 2013 and October 2014 were included. All patients underwent thoracoscopic MIE (lasting about 4h). The initial 120 patients implemented conventional care (Group CC), and the later 120 implemented measures of intraoperative temperature control (Group ITC). Patients' demographics and clinical outcomes were recorded and statistically compared between the two groups.

### Results:

In this cohort, the two groups were comparable in clinical features including age, sex, tumor location, histological type, pathological stage and baseline white blood cell (WBC) count. The increased WBC count was much less in Group ITC than Group CC on the midpoint of surgery ( $(1.66 \pm 1.22) \times 10^9$  vs.  $(1.71 \pm 1.10) \times 10^9$ ,  $p=0.739$ ), on the end of surgery ( $(2.03 \pm 1.33) \times 10^9$  vs.  $(2.36 \pm 1.17) \times 10^9$ ,  $p=0.046$ ), on postoperative 3h ( $(3.14 \pm 1.90) \times 10^9$  vs.  $(3.75 \pm 2.00) \times 10^9$ ,  $p=0.016$ ) and on postoperative 6h ( $(4.11 \pm 2.13) \times 10^9$  vs.  $(4.91 \pm 1.99) \times 10^9$ ,  $p=0.003$ ). Besides, the occurrence of cardiopulmonary complications on postoperative 1 day was less in Group ITC than in Group CC (8.3% vs. 14.2%,  $p=0.153$ ).

### Conclusions:

The measures of intraoperative temperature control seem to be beneficial to reduce postoperative systemic inflammation in MIE. However, further randomized controlled trials are required to confirm these findings.

**Disclosure:** No significant relationships.

**N-303****PREVENTING PRESSURE ULCERS IN PEDIATRICS PERIOPERATIVE PERIOD**Maria Filomena Silva, M.L. Gil*Bloco Operatório Pediatria 5, Hospital Dona Estefânia, Lisbon, Portugal***Objectives:**

The operating room creates unique conditions that put children at risk of developing pressure ulcers. The AORN notes “the incidence of pressure ulcers from surgery can be as high as 66%” (AORN, 2012, p. 437). There is a need for a normative instrument to guide nurses in identifying risk during diagnosing and adopting preventive measures. The Braden Q scale does not respond to all pediatrics population’s specific needs, since, when applied, all children are at risk of developing pressure ulcers. Some scales were found during the literature review. Nevertheless, none aimed to children perioperative specificities, exception made to the Braden Q + P since it answers the departure problem as it identifies the main risk factors found before. Objectives: Alert to the pressure ulcers problematic during the perioperative period; Explain the instrument’s “Braden Q + P” translation and cultural adaptation to Portuguese; Disclose the Ulcer Pressure risk in pediatrics perioperative assessment tool.

**Methods:**

Literature systematic review; Translation Process and cultural adaptation (Delphi Panel) of the evaluation instrument “Pressure Ulcer Risk in Pediatric Perioperative Braden Q + P” to Portuguese language.

**Results:**

There are no studies addressing the risk factors in children. However, in adults the most common risk factors were: Pertain low preoperative Braden scale; surgical table’s mattress type; High ASA; BMI within extremes; Hypothermia; The translation and adaptation process was successful; The Delphi panel comprised two rounds; the author accepted the changes made.

**Conclusions:**

The instrument facilitates risk diagnoses assessment; for each diagnosis, it coaches interventions beforehand; Facilitates access to information in future scientific work; the final result was instrumental in the awakening of awareness to the problem of Perioperative Pressure Ulcers.

**Disclosure:** No significant relationships.

N-304

**COMPARISON OF TWO BODY POSITIONS IN EARLY POSTOPERATIVE CARE OF PULMONARY LOBECTOMY**

L. Hou, Fen Gu, Y. Hu

*Nursing Department, Shanghai Pulmonary Hospital, Shanghai, China*

**Objectives:**

The aim of this study was to evaluate and compare the efficacy of semi-recumbent position (30°-40°) and supine position in early postoperative care of pulmonary lobectomy.

**Methods:**

A total 100 patients with pulmonary lobectomy were randomly assigned to two groups from July 2014 to November 2014. Group A (n = 50) received a semi-recumbent position and Group B (n = 50) received a supine position. The patients maintained their assigned positions after surgery in 6 hours. Comfort scale, coughing time, the time of extubation and the occurrence of atelectasis was evaluated between the two groups.

**Results:**

There was the significant differences between Group A and B in cough time (12.637±1.824 h vs. 16.069±2.320 h,  $p=0.000$ ), the time of extubation (31.25 h vs.65.75 h,  $p=0.000$ ) and occurrence of atelectasis (3/50 vs.10/50,  $p=0.037$ ). However, there was no significant difference in comfort level.

	Time of extubation (h)	Coughing time (h)	Ocurrence of atelectasis	High level of comfort
<b>GROUP A (N=50)</b>	31.25	12.637±1.824	3 (6%)	17(34%)
<b>GROUP B (N=50)</b>	65.75	16.069±2.320	10(20%)	14(28%)
<b>Z/t/X2</b>	Z=6.103	t=4.632	X2=4.332	X2=3.713
<b>p-value</b>	0.000	0.000	0.037	0.054

**Conclusions:**

Positioning of pulmonary lobectomy patients in semi-recumbent position at 30-40°is recommended as a measure to reduce the time of extubation, maintain the cough exercise and prevent atelectasis as well as promote rehabilitation in early postoperative care of pulmonary lobectomy.

**Disclosure:** No significant relationships.

N-305

**FROM LEFT LATERAL DECUBITUS TO PRONE POSITION FOR MINIMAL INVASIVE ESOPHAGECTOMY: HOW SCRUBBING FOR SPINE SURGERY HELPS THE THORACIC SURGICAL TEAM.**

Kristel Laes<sup>1</sup>, C. Boelens<sup>1</sup>, M. Penninckx<sup>1</sup>, H. Van Veer<sup>2</sup>, P. De Leyn<sup>2</sup>, P. Nafteux<sup>2</sup>

<sup>1</sup>*Department of Critical Care Nursing and Operating Rooms, University Hospitals Leuven, Leuven, Belgium*

<sup>2</sup>*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

For several years our surgeons performed the thoracoscopic part of a minimal invasive esophagectomy (MIE) in a left lateral decubitus position. When the surgeons decided to change to prone position, the nursing team in the operating room also had to make changes to the nursing procedures.

**Methods:**

With the experience of spine surgery in our unit, we were able to define the nursing aspects of the optimal prone positioning of the patient on the operating table. All the material for the positioning was thus already available. Before we started with prone position, our anaesthesiologist made us aware about the changes in airway management. Instead of a double lumen endotracheal tube, we had to change to a flexible reinforced tube with a bronchial blocker and a special face mask. We started writing a protocol about the anaesthesia, the installation, the needed materials and specific details about the operation itself. Pictures were taken and added to the protocol, which could be checked during the installation. Training for the new position started with a selected group of nurses, which was expanded to the whole team once our experience had grown sufficiently and pitfalls were identified and accordingly addressed. Adaptations to the core protocol were made as experience developed.

**Results:**

From March 2013 until December 2014 60 MIE procedures were performed in prone position. Through the experience from spine surgery and the use of a written protocol we could share our experience with our colleagues. All nursing staff involved now knows which materials are needed and how patients need to be installed.

**Conclusions:**

MIE in prone position is now the standard positioning for a minimal invasive esophagectomy in our operating room. The experience of spine surgery, the use of a written protocol and internal training helped the nursing staff to optimize and standardize a new procedure.

**Disclosure:** No significant relationships.



N-306

**APPLICATION OF FAST TRACK SURGERY PERIOPERATIVE CARE FOR VIDEO-ASSISTED THORACOSCOPIC THYMECTOMY IN NON-THYMOMATOUS MYASTHENIA GRAVIS**

Ben Ling Hu, Y. Wei, J. Zhou

*Department of Surgery, The University of Hong Kong-Shenzhen Hospital, Shenzhen, China*

**Objectives:**

Summarize the application of Fast Track Surgery (FTS) perioperative care for VATS Thymectomy in Non-Thymomatous Myasthenia Gravis.

**Methods:**

FTS perioperative care was applied in 68 consecutive patients receiving VATS Thymectomy for NTMG. Implementations included: preoperative psychological counseling; avoidance insertion of urinary catheter and central venous catheter during preoperative care; monitoring pain score for adequate postoperative analgesia; lung exercises; encouraging early ambulation; avoidance monitor during bed time for better sleep quality; monitoring and recording for dysphasia, suction equipments and Cholinesterase inhibitors available for respiratory secretions; Clinical outcomes were compared with these patients and 68 similar patients from a historical cohort (VATS for NTMG but no FTS management).

**Results:**

Complications occurred in 9 patients (13.2%) in the FTS and 13 patients (19.1%) in the Control groups ( $P=0.35$ ). Specifically, 9 patients (13.2%) in the FTS group and 8 patients (11.7%) in the Control group ( $P=0.79$ ) experienced respiratory difficulties in the post-op period. In the 9 FTS patients, the cause of the dyspnea was found to be sputum retention and the patients responded to clearance of the sputum plus muscarinic cholinoreceptor agonist therapy. In none of these patient did myasthenic crisis develop, or was ICU re-admission or ventilatory support required. The mean post-operative lengths of stay were  $3.5\pm 0.8$  days versus  $7.6\pm 1.7$  days respectively ( $P=2.9E-19$ ). The mean total expenses of the hospital stay were US\$ 2263.1 $\pm$ 301.3 versus US\$ 5116.3 $\pm$ 2585.1 respectively ( $P=2.1E-13$ ).

**Conclusions:**

Use FTS perioperative care for VATS Thymectomy in Non-Thymomatous Myasthenia Gravis is safe and may reduce patient pain , hospital cost and length of stay .

**Disclosure:** No significant relationships.

N-307

**POSTOPERATIVE PULMONARY COMPLICATIONS FOLLOWING MAJOR CHEST WALL RESECTION: THE BIRMINGHAM HEARTLANDS EXPERIENCE**

*Paula Agostini, K. Adams, H. Khalil, P. Rajesh, R. Steyn, E. Bishay, B. Naidu, M. Kalkat Thoracic Surgery, Heart of England NHS Trust, Birmingham, United Kingdom*

**Objectives:**

Patients undergoing chest wall resection and reconstruction may be at increased risk for developing significant postoperative pulmonary complications (PPC); alteration in chest wall mechanics, postoperative pain and consequent impaired physical activity amongst likely causes. The aim of this study was to prospectively measure frequency of PPC in these patients, and to observe their rehabilitation requirements.

**Methods:**

Observational data was collected between October 2012 and November 2014. Pulmonary physiotherapy and early mobilisation were routinely provided for all patients, as per usual the local thoracotomy enhanced recovery protocol.

**Results:**

33 patients underwent major chest wall resection; nineteen male (58%), with a median age of 60 years. Two patients (6%) developed PPC as determined by an objective PPC recognition score. 5 patients (15%) were electively admitted to ITU for observation, all others were cared for immediately postoperatively in the thoracic HDU, where median LOS was 3 days. On postoperative day 1 72% of patients (24) sat out of bed, and 33% (11) mobilised; this required up to 3 therapists to facilitate. Incentive spirometry for reduced lung volume was required in 66% (22), and all needed instruction in effective coughing/airway clearance. Specific therapy for shoulder dysfunction was required in 42% (14). Patients received a mean of 15 in-patient physiotherapy sessions. Patients recovering from thoracotomy (n=66) in our centre demonstrate a frequency of 21% PPC. Median HDU LOS is 1 day, and ITU admission 7.6% (5). These patients receive a mean 10 physiotherapy sessions (pulmonary therapy/early mobilisation). For all differences observed  $p < 0.05$ .

**Conclusions:**

A relatively low frequency of PPC was observed compared to frequencies reported in previous studies. Intensive monitoring and nursing care in a specialised setting are needed to deliver appropriate care following major chestwall surgery. Extensive physiotherapy, in terms of staff required and number of treatment contacts, is necessary to deliver pulmonary care inclusive of early mobilisation; this type of care may explain low incidence of PPC.

**Disclosure:** No significant relationships.



N-308

**OPTIMIZING LONG-TERM INDWELLING PLEURAL CATHETER CARE IN OUTPATIENT SETTING**Merja Räsänen<sup>1</sup>, I. Ilonen<sup>2</sup>, J. Rasanen<sup>2</sup>, J. Salo<sup>2</sup><sup>1</sup>Heart and Lung Centre, Helsinki University Central Hospital, Helsinki, Finland<sup>2</sup>General Thoracic Clinic, Heart and Lung Center, Helsinki University Central Hospital, Helsinki, Finland**Objectives:**

Long-term indwelling pleural catheter was adopted at our institution in 2003. During this time we have had a chance to optimize process for the benefit of patients, residents and staff.

**Methods:**

The following measures are made to ensure good patient flow in our unit: 1. Prior to procedure patients will receive two page document about application and postoperative management. 2. Patients will arrive to the procedure the same morning to the outpatient clinic, where routine blood tests and preoperative chest x-ray is taken. 3. After application the nursing staff will deliver standardized oral patient information about the drainage during postoperative follow-up. 4. No routine postoperative chest x-ray is needed 5. Physician will give clear instructions about drainage frequency and threshold for the patient to consult coordinating nurse. 6. If patient will require help for drainage, a separate information in both and literal form will be given to the district nurse or caregiver for delivering home nursing. 7. Patients or nursing staff may consult coordinating nurse anytime. With this consultation, the decision for referral for drain removal is made. 8. Short 5 minute video was made to instruct placement for nursing staff and surgical trainees.

**Results:**

Annually 90-110 patients are referred for indwelling pleural catheter placement and 40-50 are removed. Of these patients about 80% arrive to this procedure from home. There have not been any significant postoperative complications that have required hospitalisation due to this procedure. Phone calls due to need for postoperative instructions are made to coordinating nurse 3-6 times per week.

**Conclusions:**

Indwelling pleural catheter placement can be made safe in a outpatient setting. Patients and other caregivers are pleased for the support that coordinating nurse practitioner will give to support therapy for pleural fluid management. Due to this practise, annual rate for talc pleurodesis has decreased to under 10 patients.

**Disclosure:** No significant relationships.

N-309

**INVOLVING PATIENTS IN THE DEVELOPMENT OF A BESPOKE LUNG SURGERY HANDBOOK IMPROVES PATIENT EXPERIENCE**

Amy Kerr, S. Fyyaz, J. Webb, E. Bishay, M. Kalkat, P. Rajesh, R. Steyn, B. Naidu  
*Thoracic Surgery, Birmingham Heartlands Hospital, Heart of England NHS Foundation Trust, Birmingham, United Kingdom*

**Objectives:**

Patient centred communication is fundamental component of good care, constituting a key component of the Enhanced Recovery After Surgery (ERAS) protocol. We describe patient involvement in the development and evaluation of a bespoke handbook regarding major lung surgery to improve understanding and satisfaction with the lung cancer pathway.

**Methods:**

A single centre study was undertaken involving an interactive process to develop a handbook following discussion and feedback with all key healthcare providers (e.g. Pre-operative and admission nurses, pain team, physiotherapists etc.) and patient colleagues. Following patient discharge, patients who received a copy of the handbook were surveyed to evaluate the quality of information, its utility and overall satisfaction.

**Results:**

A patient centred information handbook was developed and refined systematically. The different stages such as what happens pre-admission, the in hospital stay and following discharge were reviewed and outlined in depth, and a personalised diagram contained to illustrate the surgery. A total 40 patients were surveyed; only 2 did not use the book at all (handbook provided too close to surgery) whilst the majority reported the read the handbook in its entirety. Feedback was overwhelmingly positive, all patients stating information to be clear or very clear and at appropriate depth. Additionally, patients commented that the handbook was shared amongst family, and useful to be able to re-refer to at each stage of the pathway. Over 90 % would recommend the handbook to other patients and felt it contributed to their overall satisfaction of their journey.

**Conclusions:**

The overall impression of and satisfaction with the handbook has been good having received strongly positive feedback.

**Disclosure:** No significant relationships.





N-310

## QUALITY OF LIFE ANALYSIS OF PATIENTS UNDERGOING LUNG RESECTION

John White, S. Dixon

*Leeds Cancer Centre, Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom*

### **Objectives:**

Patients who are due to have a lung resection complete a Quality of Life questionnaire prior to surgery and then at 3, 6 and 18 months following surgery. The purpose is to assess the impact of lung resection on patient's quality of life with the aim of developing interventions to improve the consequences of surgery.

### **Methods:**

From April 2014 all patients who attended the Leeds Thoracic Surgical Centre, UK were asked to complete a questionnaire when they first attend the surgical clinic and then in the Lung Cancer Survivorship Clinic at 3, 6 and 18 months following surgery. The questionnaires include the EORTC QLQ-C30 and LC13, MRC Breathlessness Score, Pain and the Distress Thermometer. The results have been collated to from 50 patients and are in the process of being analysed. The collection of this information is now embedded into routine practice and will provide a rich data base from which further research will be developed. The aim is to understand the physiological, physical and social impact of lung resection to develop intervention strategies.

### **Results:**

The results are in the process of being analysed at the time of completion of this submission and will present the data at the Conference. We can say that quality of completion of the questionnaires has improved since the launch of the project, and that patient compliance has been good.

### **Conclusions:**

The concept of this project was initiated as part of a wider programme of service improvement with the development of a Thoracic Surgical Patient Education Programme and a Lung Cancer Survivorship Clinic. All patients requiring thoracic surgery now attend these appointments which has provided the opportunity to collect data to ultimately enhance the quality of our service. We will continue to share our findings. The questionnaire is available on request.

**Disclosure:** No significant relationships.

**MONDAY, 1 JUNE 2015****17:20 - 18:20****NURSE SYMPOSIUM - POSTERS****N-311****PECTUS INFORMATION WEBSITE HAS SIGNIFICANTLY IMPROVED ACCESS TO CARE AND PATIENT SATISFACTION**

Theofano Tikka, J. Webb, P. Agostini, G. Manion, R. Steyn, E. Bishay, M. Kalkat, P. Rajesh, B. Naidu  
*Thoracic Surgery, Birmingham Heartlands Hospital, Heart of England NHS Foundation Trust, Birmingham, United Kingdom*

**Objectives:**

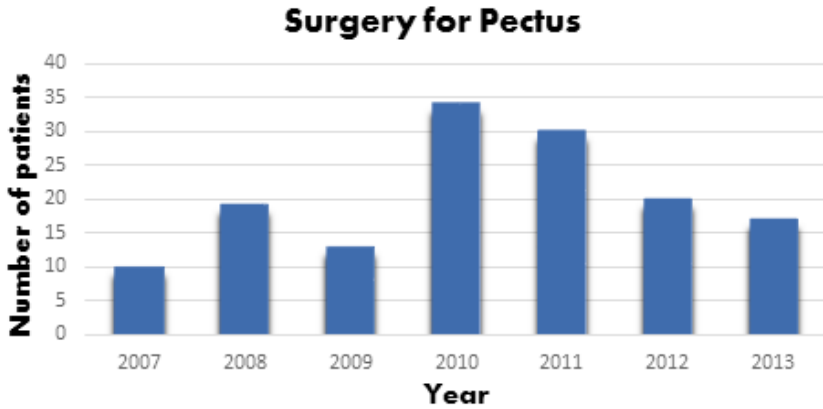
Pectus is the most common congenital disorder affecting 1 in 1000 people. Awareness amongst primary care physicians and the general public is poor. This means that many young have been denied effective surgical treatment over the years. The negative psycho social and physiological effects of having the condition are far reaching. These negative effects can be reversed by surgery and so transform the lives of a group of young people who would have otherwise had to live with their condition. We studied the effects of introducing a bespoke patient information website on referral and activity patterns.

**Methods:**

The regional thoracic Surgery Team at Heart of England Hospital NHS Trust produced an innovative information website, [www.pectus.co.uk](http://www.pectus.co.uk), accessible to the general public, providing information about pectus deformities; management options; risk and benefits of surgery; general advice about the surgery and the recovery process. Referral patterns and number of cases where studied before and after the introduction of the website in 2010.

**Results:**

The website has had considerable traffic with 2,179 hits in 2012 4,983 in 2013 and 4,904 so far in 2014 (google analytics 1.9.14). This has led to 1421 contacts and 372 email enquiries. These emails have resulted in an increase numbers of patients who have been assessed and then go on to have surgery (figure 1). Patient satisfaction (Brompton single step questionnaire) with the service is good.

**Conclusions:**

The introduction of a patient information website has significantly improved access to specialised services for a group of young people.

**Disclosure:** No significant relationships.

N-312

**NO APPRECIATION FOR FOOD - AN EVALUATION OF NUTRITIONAL DIALOGUES WITH PATIENTS OPERATED ON FOR ESOPHAGEAL CANCER**

Mette Hansen, I.M. Jackson, M.N. Schoenau

*Cardiothoracic Surgery, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark*

**Objectives:**

Patients operated for oesophagus cancer experience several challenges related to nutrition. The nutritional support of these patients has been systematized. This implies that during hospitalization the nurse has two structured dialogues with the patient about nutrition and a telephone follow-up after discharge. It also included that the nurse, the patient, and possible relatives developed together an individual nutrition plan prior discharge from hospital. The present study aims to evaluate nutritional support to patients operated for oesophagus cancer, concerning - The patient experience of using the nutrition plan and with eating after the operation - The importance of relatives for the patient's nutrition.

**Methods:**

Semi-structural qualitative telephone interviews of 10 patients, operated for oesophagus cancer, have been accomplished. The interviews are taped and transcribed word-for-word. Next analyzed after Steinar Kvale's method; meaning condensation. Two issues relevant to this study are presented. "The nutrition plan" and "Relatives".

**Results:**

The interviews show that the nutrition plan is an encouragement for patients operated for oesophagus cancer. Four topics emerged. Especially immediately after discharge it is "Difficult to comply with recommendation for six meals a day", and also just after discharge the nutrition plan is followed, as "The nutrition plan is seen as an encouragement in the period after discharge". Several patients "Reject fat food and proteindrinks" and call for a nutrition plan presenting relevant alternatives. "The importance of relatives" – relatives can be a great support if they do not press the patient too much. It appeared that patients without relatives find it difficult to overview eating sufficiently.

**Conclusions:**

The dialogues about nutrition are a substantial initiative. There is a need for alternatives to fat food and protein drinks. The nurses' knowledge of relevant offers of food supplement and methods of involvement of relatives must be strengthened.

**Disclosure:** No significant relationships.



N-313

**LUNG CANCER SURVIVORSHIP CLINIC**John White, S. Dixon*Leeds Cancer Centre, Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom***Objectives:**

To develop a streamlined approach to follow up after curative surgery for lung cancer.

**Methods:**

Patients who had received curative surgery for lung cancer within the Leeds Cancer Unit could be followed up by 3 different specialist teams. There was no agreed follow-up protocol. Post-treatment imaging would be based on individual clinician preferences and the Lung Cancer Nurse Specialist (LCNS) input would be reactive to patient's needs. After publication of the National Cancer Survivorship Initiative (2013) a decision was made to develop a Survivorship Clinic for all patients after lung resection.

**Results:**

The Leeds Lung Cancer Unit Survivorship Clinic was introduced in April 2014 and is run by the LCNS (including the Thoracic Surgical Nurse Specialist) and the Lung Cancer Respiratory Physicians. Patients are seen 3, 6 and 18 months after completion of treatment with CT scans performed at 6 and 18 months post-treatment. The Lung Cancer Nurse consultation is guided by findings from a Health Needs Assessment and QoL tool completed in clinic. The LCNS consultation includes a review of the patient's concerns together with an assessment of any psychosocial and lifestyle issues. Appropriate referrals are made and may include referral to the Smoking Cessation service. The medical consultation focuses on a review of the status of lung cancer and late effects of treatment. Documentation is made of pre- and post-treatment physiology, COPD management review (where appropriate) and any other chronic disease management review.

**Conclusions:**

The completion of the HNA and QoL helps to support the discussion of patient concerns. Early detection of relapse has allowed for rapid re-assessment for treatment options. Evaluation of the HNA and QoL tools has started (abstract submitted for ESTS). The clinicians report that the SC allows their own satisfaction for having dedicated time to meet the needs of patients. It has freed up capacity in the Respiratory, Thoracic Surgical and Oncology clinics.

**Disclosure:** No significant relationships.

N-314

**THE CASE FOR INCREASED THORACIC CLINICAL NURSE SPECIALIST TIME TO SUPPORT THORACIC SURGERY PATIENTS**

E. Kirkland, L. Keepin, Lois Phillips  
*BRI, Ward A700, UH Bristol, Bristol, United Kingdom*

**Objectives:**

BRI is a tertiary centre providing thoracic surgical services. The majority of patients treated have lung cancer or other malignant disease, and are supported pre- and post-operatively by 1.0 WTE Thoracic Clinical Nurse Specialist (TCNS). An increase in consultant surgeons has expanded thoracic surgical services over a 5 year period, however TCNS provision has remained static. This has resulted in an inability to comply with the National Institute of Clinical Excellence (NICE) guidance on the management of lung cancer, and reduced opportunities to expand the TCNS role.

**Methods:**

NICE guidance recommends that patients;

Have access to CNS support at all stages of care during surgery for lung cancer

Are offered the option of nurse-led follow up after surgery for lung cancer

Current TCNS provision cannot meet these recommendations – there is no TCNS cover for periods of leave, and nurse-led follow up after surgery for lung cancer is not offered. A business case was therefore submitted proposing increased TCNS funding, and providing an opportunity to consider the expansion of the TCNS role.

**Results:**

The business case identified the need for an additional 0.8 WTE Band 6 TCNS to support the thoracic surgical service through;

Access to CNS support during periods of leave

The transition to nurse-led follow up after surgery for lung cancer – 90% of planned appointments could transfer from consultant led clinics over 5 years

The consolidation of regular nurse-led, long-term drain clinics

Post discharge telephone calls to patients to support day case surgery, and the Enhanced Recovery Programme

The business case also identified potential further expansion of the TCNS role through an enhanced clinical teaching role and the possibility of peripheral nurse-led follow-up.

**Conclusions:**

The business case successfully demonstrated the need for an additional 0.8 WTE Band 6 TCNS, and the post has been recruited to. Evaluation of the impact upon the service and role will be required.

**Disclosure:** No significant relationships.



N-315

**AGE- AND GENDER-CORRECTED BODY MASS INDEX: A NEW APPROACH IN SCREENING FOR UNDERWEIGHT IN ESOPHAGECTOMY FOR CANCER**

H. Vandeweege<sup>1</sup>, Johnny Moons<sup>1</sup>, T. Lerut<sup>2</sup>, H. Van Veer<sup>2</sup>, W. Coosemans<sup>2</sup>, G. Decker<sup>2</sup>, P. De Leyn<sup>2</sup>, P. Naftoux<sup>2</sup>

<sup>1</sup>*Nursing, University Hospital Leuven, Leuven, Belgium*

<sup>2</sup>*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

**Objectives:**

Esophagectomy for cancer is often accompanied with severe preoperative weight-loss. The magnitude of this weight-loss is typically measured by weight-loss-percentage and/or Body-Mass-Index (BMI). Current screening tools for underweight (NRS2002) lack sensitivity/specificity in this specific patient population with high gastrointestinal tumors. This is because BMI-criteria, as defined by the World Health Organization, are both age- and sex-independent. Aim of this study was to incorporate the latter two parameters in “age-gender specific BMI-percentiles” (AG-BMI) and evaluate this newly developed algorithm in relation to postoperative outcomes.

**Methods:**

Six hundred forty-two consecutive patients who received esophagectomy for cancer between 2005 and 2010, were analyzed. Only four parameters are necessary in this newly developed algorithm: age, gender, height and weight. Cut-off point to determine underweight was set at AG-BMI<10<sup>th</sup> percentile. Overall survival (OS) was analyzed by means of Kaplan-Meier log rank test and Cox-regression analysis.

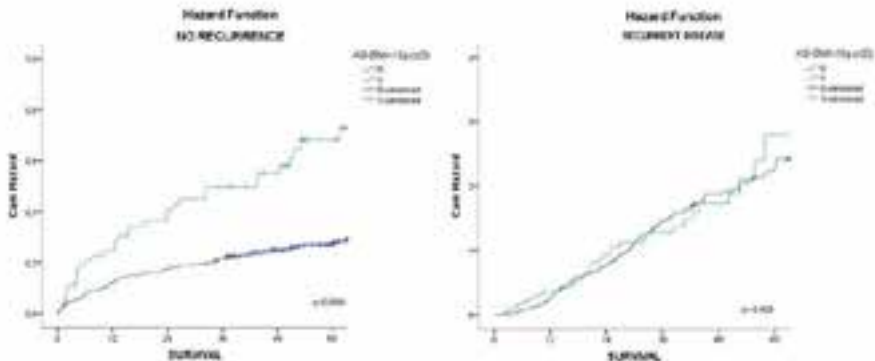
**Results:**

There were 111 (17.2%) patients within the preoperative AG-BMI<10<sup>th</sup> percentile. No statistical significant differences were found in the perioperative outcomes (occurrence and severity of complications, postoperative mortality, length of hospital stay) between AG-BMI<10<sup>th</sup>pct and AG-BMI≥10<sup>th</sup>pct. Multivariate analysis withheld five independent prognosticators for OS: these were mainly oncologic factors and AG-BMI<10<sup>th</sup> percentile (OR 1.540).

Variables in the Equation							
	$\beta$	SE	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
						Lower	Upper
Early vs. Advanced	-1.362	0.195	1	< 0.0001	0.251	0.171	0.368
Age	0.021	0.006	1	< 0.0001	1.021	1.010	1.033
R-Status			2	0.002			
R0 vs. R1	0.631	0.204	1	0.002	1.879	1.280	2.803
R0 vs. R2	0.488	0.347	1	0.567	1.632	1.028	3.936
Number of positive LNs	0.056	0.015	1	< 0.0001	1.058	1.040	1.085
AGBMI < 10 <sup>th</sup> pct vs. >= 10 <sup>th</sup> pct	0.432	0.148	1	0.004	1.540	1.151	2.060

SE = Standard Error; df = Degrees of Freedom; Sig. = Significance (Exact) = Hazard Ratio; CI = Confidence Interval; vs. = versus; pct = percentile

Variables not in the Equation			
	Score	df	Sig.
Primary surgery vs. CRT+Surgery	0.147	1	0.702
Gender	0.428	1	0.528
cT-Status	3.987	4	0.408
Histology (AC vs. SCC)	0.005	1	0.938
Preoperative weightloss %	1.301	1	0.242
BMI at time of surgery	0.130	1	0.719



AG-BMI < 10<sup>th</sup> percentile identified a significant ( $p < 0.0001$ ) higher number of non-esophageal-cancer-related deaths (i.e. patients who died without any evidence of recurrent esophageal cancer) within 5 years post-esophagectomy.

### Conclusions:

Age-Gender specific BMI-percentiles did not help to identify patients at risk for perioperative in-hospital complications or mortality. However our data suggest a deleterious underweight-related impact on OS once the patient is discharged from the well-controlled hospital environment. In the subgroup of patients who didn't show recurrent disease, hazard rates for dying in the early postoperative phase are significantly higher in the preoperative AG-BMI < 10<sup>th</sup> percentile group. Therefore AG-BMI can be a precise tool to tailor multidisciplinary perioperative nutritional strategies and prevent further weight loss.

**Disclosure:** No significant relationships.





N-316

**SELF- MANAGEMENT TO OPTIMIZE MEDICATION ADHERENCE IN PATIENTS SUBMITTED TO PULMONARY TRANSPLANTATION – NURSE’S INTERVENTION**

Susana Silva, J. Gonçalves

*Cirurgia Cardiorácica, CHLC - Hospital Santa Marta, Lisbon, Portugal*

**Objectives:**

To emphasize the importance of nurse intervention as a member of the care-giver team, in the process of self- management in long-term medication regimens, to optimize adherence in patients submitted to pulmonary transplantation.

**Methods:**

We have made a research in major electronic databases (ex. Medline, Pubmed) focused on English language articles with full text, published in the last eight years using the key words: pulmonary transplantation, medication adherence patient empowerment.

**Results:**

Adherence to medication and self-management are essential for the success of Lung transplantation. Complex drug regimen on a long term condition requires an effort of care giver team to reduce medication errors and optimize drug adherence. After organ transplantation, nonadherence to medication is thought to be one of the most important causes of graft failure. Strategies to facilitate alertness of both patient and care-giver team are necessary and must be initiated as soon as possible. Patient empowerment as a facilitator process of behavioral changes, allows patients to create critical thinking and decision making in his own health-disease process which is crucial as a strategy of error control. When the patient becomes more self-effective, becomes a partner with the care-given team in the process. Error medication in the specific situation of lung transplantation recipients is related to three fundamental elements: recent flow sheet version, patients’ diary cards and pill containers. Inconsistencies between these elements probably as consequence of improperly update, missing pill container or drug, result with an incorrect intake (wrong dose, time or frequency).

**Conclusions:**

Considerable efforts have to be done to reduce medication errors and optimize adherence in these patients with complex long term medication regimens. Strategies that gradually empower patients are essential to enable them to follow medication and to stimulate alertness that improves adherence. Nurses are the key element in the care-given team to this process.

**Disclosure:** No significant relationships.

N-317

**REGAINING FAMILIARITY WITH OWN BODY AFTER TREATMENT FOR OPERABLE LUNG CANCER - A QUALITATIVE LONGITUDINAL EXPLORATION OF THE EMBODIED MEANING OF ILLNESS**

Malene Missel<sup>1</sup>, J. Holst Pedersen<sup>1</sup>, C. Hendriksen<sup>2</sup>, M. Tewes<sup>3</sup>, L. Adamsen<sup>4</sup>

<sup>1</sup>*Department of Thoracic Surgery, University Hospital of Copenhagen, Copenhagen, Denmark*

<sup>2</sup>*Faculty of Health And Medical Sciences, University of Copenhagen, Copenhagen, Denmark*

<sup>3</sup>*The Heart Centre, University Hospital of Copenhagen, Copenhagen, Denmark*

<sup>4</sup>*Ucsf/ Faculty of Health And Medical Sciences, University of Copenhagen, Copenhagen, Denmark*

**Objectives:**

Little is known about operable lung cancer patient experiences during a treatment trajectory in a clinical setting based on principles of fast-track surgery programmes. The study aimed a) to understand the embodied meaning of illness of patients with operable lung cancer during and after treatment to four month after surgery and b) to understand the patterns of change over time that may influence the patients' daily lives.

**Methods:**

Twenty patients referred for lung cancer surgery were interviewed at three time points corresponding with potential critical transitions following lung cancer surgery; 1) hospitalization, 2) transition from hospital to home, 3) resumption of daily life activities. A phenomenological hermeneutical approach was applied for data collection, analysis and interpretation inspired by Ricoeur and the theoretical framework was grounded in Merleau-Ponty's phenomenology of perception.

**Results:**

The study demonstrated the patients' process of regaining familiarity with own body after lung cancer treatment illuminated in four sub-themes: Perceptions of embodied alterations, Transformation of embodied structures in the transition from hospital to home – an unexpected challenge, Embodied perceptions of the intersubjective world and, Transforming embodied disruptions into bodily awareness.

**Conclusions:**

Surprisingly the twenty patients experienced a relative smooth treatment trajectory regarding physical consequences of illness and treatment. This might be due to the fast-track surgery principles which ensured fast convalescents of the 'objective' body. Clinicians should consider the patients' need for discussing their illness experiences in order for the patients to reconstitute own identity.

**Disclosure:** No significant relationships.



N-318

**MANAGEMENT OF POSTOPERATIVE PULMONARY COMPLICATIONS:  
THE ROLE OF EXPERIENCED NURSE**

Hüseyin Melek, S. Sumer, G. Cetinkaya, S. Colakoglu, M.M. Erol, M. Bidin, E. Gungor, A.S. Bayram, C. Gebitekin  
*Thoracic Surgery, Uludag University Faculty of Medicine, Bursa, Turkey*

**Objectives:**

Secretion retention leading to pulmonary complications is the most common cause of morbidity and mortality after lung resections. Nursing services along with respiratory physiotherapy, pain management, mobilization are fundamental in preventing and treating secretion retention in the early postoperative period. In this study, we evaluated the factors, particularly nursing experience, affecting the prevention and treatment of secretion retention.

**Methods:**

This retrospective study investigated 220 patients who underwent lobectomy and upper lung resection between 2013 and 2014 in our department. We included 18 (8%) patients who developed major atelectasis secondary to secretion retention and underwent bronchoscopy despite to medical treatment along with physiotherapy, pain management and mobilization. Possible factors leading to major atelectasis were recorded. The nursing service provided to the patients in the last 72 hours was investigated using a developed scoring system and individual scores were compared.

**Results:**

The indication for surgery, lung cancer in 15 patients and benign diseases in 3 patients. Type of resection was lobectomy in 16 and segmentectomy in two patients. Major atelectasis developed in 14 patients in 2013 (14/103) and in only four patients 2014 (4/117) respectively,  $p=0,006$ . There were no mortality in this group. Atelectasis was completely resolved after bronchoscopy in 17 patients, however one patient required additional bronchoscopy. The mean age, experience in nursing and experience in thoracic surgery clinic of the nurses were 33,9 (29-40) years, 8,6 years (2-16) and 6 months (0-12), respectively. The mean performance score of the nurses involved was 14,5 (9,5-25,5). Performance score of two nurses whose were new at thoracic surgery department was 25,5 and 20 which was greater than the other nurses'.

**Conclusions:**

In this study, we found that successful management in the postoperative prevention of secretion retention relies on the thoracic surgical experience of the nurses rather than individual experience in nursing.

**Disclosure:** No significant relationships.

**N-319****PATIENTS WITH INOPERABLE ESOPHAGEAL CANCER WANT KNOWLEDGE ABOUT NUTRITION**Sara Chahboun*Thoracic Surgery, Rigshospitalet, Copenhagen, Denmark***Objectives:**

In Denmark approximately 250 people are affected annually of cancer in the esophagus, and 2/3 are inoperable. Thoracic department at Rigshospitalet receive approximately 100 patients annually for stenting of the esophagus. These patients have a high risk of dying from malnutrition. There is a lack of dedicated focus on these patients' nutritional issues. The Nurses feel that education on nutrition of these patients are difficult and they feel unsure whether the patients need more knowledge. The aim of this study was to explore which nutritional issues patients with inoperable esophagus cancer have and if they need information about nutrition.

**Methods:**

Patients with inoperable esophagus cancer admitted to Thoracic surgery department at Rigshospitalet, for stenting of a malignant stenosis were consecutively included. Exclusion criteria: patients who were terminal or unable to understand the questionnaire. A method triangulation with a combination of quantitative questionnaire with closed answer categories and qualitative interviews were used. The interviews were recorded, transcribed and analyzed with the meaning condensation of Steinar Kvale.

**Results:**

15 patients answered the questionnaire and three patients were subsequently interviewed. The questionnaire showed that 100% of the patients had weight loss and nutritional problems. 80% had decreased appetite, 66.7% had fewer meals than before they got cancer, 53% had received nutritional education, 80% had received booklets and 80% wanted more knowledge. The key themes of the interviews: "Dysphagia", "body experience", "preventing swallowing problems", "did not read the booklets", "no memory of the booklets", "the booklets are not suitable for all", "nutritional education use in daily life" and "more nutritional knowledge is needed".

**Conclusions:**

Nurses believed that patients with inoperable esophageal cancer did not want information about nutrition after stenting. The study showed that these patients wishes more knowledge about nutrition, and illustrates a contrast of what nurses think patients want and what patients really want.

**Disclosure:** No significant relationships.



N-320

**CONGENITAL TRACHEAL STENOSIS: POSTOPERATIVE NURSING APPROACH AFTER SLIDE TRACHEOPLASTY**A. Mansoa, D. Ferreira, M. Venda, Mónica Rodrigues*Cirurgia Cardiorácica - Uci, Hospital de Santa Marta, Lisbon, Portugal***Objectives:**

Congenital tracheal stenosis is a rare disorder, potentially lethal if left untreated. The slide tracheoplasty has become an accepted surgical approach to this problem with enormous positive results. We intend to present the first pediatric case of slide tracheoplasty performed in the cardiothoracic surgery department of a Portuguese Hospital, and share our experience on the postoperative nursing management in the intensive care unit.

**Methods:**

Description of the first clinical case of slide tracheoplasty in our department, and of the postoperative nursing approach.

**Results:**

This clinical case relates to a 14 month old male child with a history of multiple respiratory infections always diagnosed as bronchiolitis episodes. At the age of 10 months old, due to an episode of severe stridor, he was submitted to a computerized axial tomography scan that revealed a tracheal stenosis in the medium segment, also confirmed by bronchofibroscopy. The child was then submitted to slide tracheoplasty, with off pump surgery, without intraoperative complications. He was under mechanical ventilation for 48 hours and was under non-invasive ventilation for another 4 days. The main concern on nursing approach after surgery was to prevent complications of intubation and mechanical ventilation, long intensive care length of stay and familiar stress. The patient stayed in the intensive care unit for 3 days and had hospital discharged 20 days after surgery.

**Conclusions:**

The congenital tracheal stenosis is a rare and complex disorder that requires a multidisciplinary approach of a team with pediatric experience. This first case was a great opportunity to further increase the knowledge of the team in this rare disorder.

**Disclosure:** No significant relationships.

N-321

**WHAT ARE THE ADVANTAGES? A PROSPECTIVE ANALYSIS OF 16 VERSUS 28 FRENCH CHEST TUBE SIZE IN VIDEO-ASSISTED THORACOSCOPIC SURGERY LOBECTOMY OF LUNG CANCER**Mei Yang, H. Zhou, F. Qiu*Department of Thoracic Surgery, West China Hospital, Chengdu, China***Objectives:**

The purpose of this study was to compare the advantages of small (16F) versus large (28F) chest tubes for use in video-assisted thoracoscopic surgery (VATS) lobectomy of lung cancer.

**Methods:**

This is a prospective, institutional review board-approved observational study in department of thoracic surgery, west china hospital, Sichuan University. Data from 163 patients (February -May 2014) who underwent VATS lobectomies of lung cancer with insertion of one chest drain (16F or 28F) were analysed. The following postoperative data were compared: pain, primary of healing tube incision, CXR abnormalities (pneumothorax, fluid, atelectasis, subcutaneous emphysema, haematoma), drainage time, and new drain insertion, wound healing at the site of insertion.

**Results:**

A total of 73 patients received 16F, and 90 received 28F chest tubes. Both groups were similar in age, gender, and comorbidities, and pathological evaluation of resection specimens.; After adjustment, no statistically significant difference in tube-related complications, including residual pneumothoraces (4.10%(3/73) vs. 4.44%(4/90);  $p = 1.00$ ), subcutaneous emphysema (8.21%(6/73) vs. 6.67%(6/90);  $p = 0.789$ ), or retained hemothorax (4.10%(3/73) vs. 0%(0/90).  $p = 0.253$ ), was found when comparing 16F versus 28F chest tubes. The average total drainage volume of 16F group ( $365 \pm 106$ ml) was less than 28F( $665 \pm 217$ ml) $p=0.030$ ; the average take out stitches time of drain site in 16F group ( $7.05 \pm 2.11$ d) was less than 28F( $14.33 \pm 3.87$ d)  $p=0.034$ ; the rates of primary healing at the site of insertion in 16F group (95.45%(70/73)) was higher than 28F(77.73%(70/90) $p=0.039$ ;, but postoperative length of stay on difference ( $4.23 \pm 0.05$ d vs  $4.57 \pm 0.16$ d) $p=0.078$ .

**Conclusions:**

For vats lobectomy patients with lung cancer, chest tube size did not impact the clinically relevant outcomes tested. However, small tube has contribute to wound healing at the site of insertion.

**Disclosure:** No significant relationships.

N-322

**CRITERIA IN THE IMPLEMENTATION OF PALLIATIVE SEDATION.**

Silvina Moura<sup>1</sup>, L. Marques<sup>1</sup>, V. Silva<sup>2</sup>, J. Gonçalves<sup>3</sup>, P. Pontifice De Sousa<sup>4</sup>

<sup>1</sup>*Unidade de Cuidados Intensivos do Serviço de Cirurgia Cardiorácica, Centro Hospitalar Lisboa Central - Pólo Hospital de Santa Marta, Lisbon, Portugal*

<sup>2</sup>*Serviço de Cuidados Continuados E Paliativos, Hospital da Luz, Lisbon, Portugal*

<sup>3</sup>*Serviço de Pneumologia, Centro Hospitalar Lisboa Central - Pólo Hospital de Santa Marta, Lisbon, Portugal*

<sup>4</sup>*Instituto de Ciências da Saúde, Universidade Católica Portuguesa, Lisbon, Portugal*

**Objectives:**

To describe the considerations to take into account by the health team in the implementation of palliative sedation to the patient in the end of his life.

**Methods:**

Revision of the literature with the key-words “Palliative sedation” and “Person in the end of life” in edited scientific works and scientific articles published in the last five years.

**Results:**

In the elaborated revision it is consensual that in the implementation of the palliative sedation we are before the existence of a chronic and prolonged illness, without response to the treatments, being death predictable within hours/days. There is also an intense suffering and definitely refractory, being the sick person in deep existential suffering without response to other interventions, as well as other serious and severe symptoms, for which, according to the person's perspective, there is no adequate treatment (refractory symptoms), namely the pain, the anguish, the agitation/ delirium/confusion/hallucination, dyspnoea, discomfort, fear/panic/ anxiety and other emergent situations, namely in presence of massive bleeding, asphyxia, terminal serious dyspnoea and uncontrollable pain. It is important to stress that there should exist a previous consent of the patient or his legal representative based on the validation of his knowledge concerning the expected and the purposes of comfort with palliative sedation (transmitted by the health professionals), and for this reason it is important to involve the family in the process of the decision making as well as to offer spiritual and religious support and leave in writing in the clinical process the intention of non- reanimation.

**Conclusions:**

The palliative sedation is a useful therapeutic response in the process of a chronic illness in the end of life, as it is the case of people with a terminal pulmonary disease; however, it is important to consider consensual criteria, which aim at dignifying the care of the human being.

**Disclosure:** No significant relationships.

**NOTES**

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**23<sup>rd</sup> European Conference on General Thoracic Surgery****31 May – 3 June 2015****Lisbon Congress Center, Lisbon, Portugal**

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