



22nd European Conference on General Thoracic Surgery



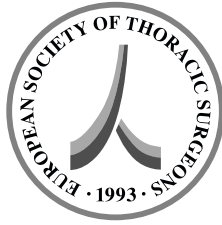
**European Society
of Thoracic Surgeons**

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Copenhagen – Denmark

15 – 18 June 2014

ABSTRACTS



22nd European Conference on General Thoracic Surgery

**15 – 18 June 2014
Bella Center, Copenhagen, Denmark**



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MONDAY, 16 JUNE 2014**08:30 - 10:30****SESSION I: BROMPTON****B-001****ERGON – TRIAL: ERGONOMIC EVALUATION OF SINGLE-PORT ACCESS VERSUS THREE-PORT ACCESS VIDEO-ASSISTED THORACIC SURGERY**Luca Bertolaccini¹, A. Viti¹, A. Terzi²¹*Thoracic Surgery, S. Croce e Carle Hospital, Cuneo, Italy*²*Thoracic Surgery, Sacred Heart Hospital, Negrar, Italy***Objectives:**

Video-Assisted Thoracic Surgery (VATS) single-port-approach seems to be logical evolution of standard three-port-approach. To compare, in clinical settings, the ergonomic characteristics of Uniportal VATS and three-port VATS.

Methods:

Posture analysis during 100 VATS wedge-resections (50 Uniportal VATS vs. 50 three-port VATS). Most demanding procedures, such as major lung-resection, were excluded. Body-posture assessment of operating surgeon was performed by measurement of head-trunk axial rotation and head's flexion in sagittal plane. Screen height, distance, inclination could be adjusted to operator preference. We recorded eye-height and viewing-distance (eye-to-monitor) to calculate viewing direction (neck flexion/extension combined effort and angle-of-gaze performed by extraocular musculature). Mental workload was assessed by National Aeronautics Space Administration Task Load index (NASA-TLX), multidimensional tool rating workloads on six scales (mental, physical, and temporal demand; effort; performance; frustration). Power analysis was performed to calculate sample size for paired analysis ($\alpha=0.05$, $\beta=0.80$). Pearson's χ^2 test and Fisher's exact test were used to calculate probability value for variables comparison. Cohen's effect sizes were calculated to estimate difference magnitude.

Results:

All procedures were completed without any adverse events. Statistically significant reduction in head-trunk axial rotation was achieved in Uniportal VATS. Neck-flexion was significantly improved in Uniportal VATS (preventing extension of neck). Viewing-direction significantly declined ($p=0.01161$) in three-port VATS. Angle of gaze was not influenced by monitor position ($p=0.56431$). Global NASA-TLX- score (overall workload) was significantly higher ($p=0.0409$) during three-port VATS. NASA-TLX-score on frustration was significantly higher with Uniportal VATS ($p=0.02188$). Physical demand of three-port VATS was significantly greater than Uniportal VATS ($p=0.00629$). Analysis on temporal demand showed similar results.

Ergonomic characteristics recorded in 100 VATS wedge resections (50 Uniportal VATS vs. 50 three-port access VATS).

^(§) Effect sizes were calculated only for statistically significant results.

^(¶) Viewing direction = $\sin [(eye\ height - screen\ height)/viewing\ distance]$

N.A. = Not Applicable.

	Uniportal VATS	Three-port VATS	<i>p</i> value	Effect Size ^(§)
Head-trunk axial rotation (degree)	2.13±3.56	9.65±5.45	0.02844	1.63370
Mean head's flexion, sagittal plane (degree)	3.46±2.23	4.32±1.23	0.75791	N.A.
Viewing direction ^(¶)	-4.26±3.32	-15.47±4.69	0.01161	2.72694
NASA Task Load index				
- Global	39.71±3.54	23.46±2.92	0.04090	5.00790
- Mental demand	39.52±3.21	28.94±3.33	0.18325	N.A.
- Physical demand	24.32±3.53	47.47±2.66	0.00629	7.40700
- Temporal demand	41.88±3.63	40.67±5.53	0.89327	N.A.
- Effort	21.33±4.52	48.72±4.33	0.00106	6.18840
- Performance	37.13±5.25	39.84±4.94	0.75791	N.A.
- Frustration	45.68±3.64	26.24±3.31	0.02188	5.5879

Conclusions:

Uniportal VATS significantly improve the posture of surgeons: surgeons can stand straight in front of monitor with minimal neck-extension/rotation. Surprisingly, frustration is major in Uniportal VATS. Future research efforts will include establishment of VATS ergonomic guidelines and investigation of their influence on potential change in physical workload.

Disclosure: No significant relationships.

B-002

ALSO IN THE NETHERLANDS INCREASED POSTOPERATIVE MORTALITY AFTER LUNG CANCER SURGERY ON FRIDAYSPeter Plaisier¹, A. Maat², R. Damhuis³¹*Surgery, Albert Schweitzer Hospital, Dordrecht, Netherlands*²*Cardiothoracic Surgery, Erasmus Medical Center, Rotterdam, Netherlands*³*Epidemiology, Dutch National Cancer Registry, Utrecht, Netherlands***Objectives:**

A recent study reported on the association between postoperative mortality [POM] and the day of week of elective surgical procedures [BMJ 2013;346:f2424]. For lung surgery, POM was significantly increased as soon as procedures were carried out on Fridays (odds-ratio: 1.75). Aim of this study was to investigate whether this finding would also apply to the Netherlands.

Methods:

Data were retrieved from the Dutch National Cancer Registry regarding patients operated for primary non-small cell carcinoma during the period 2005-2010. Excluded were children, patients diagnosed in our country but operated abroad, and non-anatomical resections. POM was defined as death within 30 days after operation independent of cause of death or hospital discharge. Using multivariate logistic regression, a prediction model was developed based on the variables age, sex, type of operation and period. This case-mix model was applied to examine day of the week of operation, hospital volume and surgical technique (VATS versus open).

Results:

The series comprised 9,579 patients (37% female, 63% male) with 36% ≥ 70 yrs. Overall POM was 2.7%, declining from 3.3% in 2005-2007 to 2.1% in 2008-2010; the proportion of pneumonectomies dropped from 17 to 12%. POM increased with age and was higher for men. Hospital volume ($p=0.57$) and surgical technique ($p=0.24$) were not of prognostic significance. POM for operations on Monday-Thursday (85%) was 2.5% against 4.0% for operations on Fridays (13%). This difference remained significant after correction for case mix (odds ratio : 1.59; 95% confidence interval : 1.14-2.21). POM for urgent (i.e. non-elective) operations during the weekend (2%) was 6.8%.

Conclusions:

This study confirms increased POM for lung cancer surgery performed on Fridays. Since the underlying cause could not be determined from our data, clinical audits are needed to investigate our hypothesis that this phenomenon is caused by limited staffing during weekends prohibiting early detection and adequate management of complications.

Disclosure: No significant relationships.

B-003**LUNG TRANSPLANTATION WITH DONORS 60 YEARS AND OLDER**

I. Lopez, Alberto Jauregui, J. Sole, M. Deu, L. Romero, J. Perez, I. Bello, M. Wong, M. Canela

Thoracic Surgery, Vall d'Hebron Hospital, Barcelona, Spain

Objectives:

The objective of this study was to compare the outcomes in lung transplantation between organs from donors older and younger than 60 years.

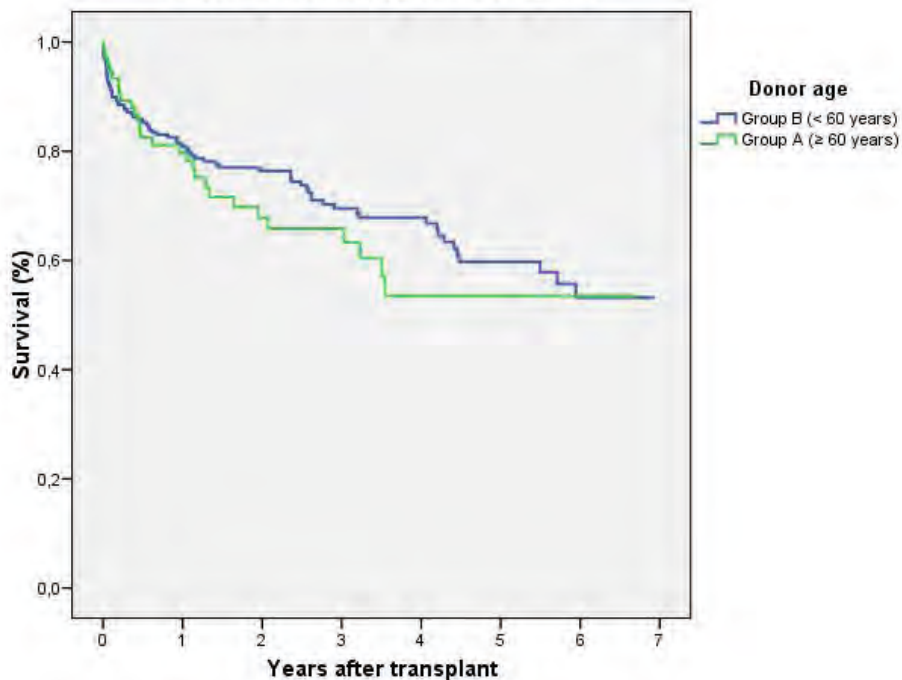
Methods:

We performed a retrospective observational study comparing the group of patients receiving organs from donors 60 years or older (group A) or younger than 60 years (group B). We analysed 293 consecutive adult lung transplants between January 2007 and December 2012, 75 (25.6%) in group A and 218 (74.4%) group B. Postoperative outcomes and global survival rate were evaluated. Pearson's chi-squared, ANOVA, Mann Whitney U and Kaplan-Meier with Log-Rank test were used for comparisons.

Results:

The percentage of donors 60 years and older used in our center has been increasing from 12.2% in 2007 to 34.9% in 2012. The donor mean age was 63.7 years (r: 60-71) in group A and 41.6 years (r: 13-59) in group B. Regarding donor characteristics, there were fewer smokers (27% vs 42.9%; $p=0.016$) and fewer donors with thoracic trauma (0% vs 5.6%; $p=0.038$) or purulent secretions (4% vs 15.1%; $p=0.011$) in group A. Regarding recipient characteristics, the mean age was higher in group A (54.7 vs 49.3 years; $p<0.001$). The 30-day and in-hospital postoperative mortality in group A and B was 5.3% vs 9.2% ($p=0.291$) and 14.7% vs 12% ($p=0.547$). Postoperative morbidity and median hospital stay (32.5 vs 40 days; $p=0.160$) were similar in both groups. There were no statistically significant differences between groups A and B in terms of survival at 1, 2 and 3 years: 79.7, 67.8 and 65.8% vs 81.1, 76.4 and 69.5% ($p=0.336$).

Survival stratified by donor age group



Conclusions:

Our results support the idea that donors older than 60 years can be used safely for lung transplantation with comparable results to younger donors in terms of postoperative outcomes and mid-term survival.

Disclosure: No significant relationships.

B-004

PROGNOSTIC MODEL OF SURVIVAL FOR TYPICAL BRONCHIAL CARCINOID TUMORS: ANALYSIS OF 1090 PATIENTS ON BEHALF OF THE ESTS NEUROENDOCRINE TUMORS WORKING GROUP

Pier Luigi Filosso¹, F. Guerrero¹, A. Evangelista², S. Welter³, P. Moreno⁴, E.A. Rendina⁵, F. Venuta⁵, W. Travis⁶, P. Thomas⁷, I. Sarkaria⁸

¹*Thoracic Surgery, University of Torino, Italy, Torino, Italy*

²*Unit of Cancer Epidemiology And Cpo Piedmont, San Giovanni Battista Hospital, Torino, Italy*

³*Thoracic Surgery, Ruhrlandklinik, Essen, Germany*

⁴*Thoracic Surgery, University Hospital "Reina Sofia" Cordoba, Cordoba, Spain*

⁵*Thoracic Surgery, "La Sapienza" University, Rome, Italy*

⁶*Pathology, Memorial Sloan-Kettering Cancer Center, New York, United States of America*

⁷*Department of Thoracic Surgery, Marseille University Hospital, Marseille, France*

⁸*Thoracic Surgery, Memorial Sloan-Kettering Cancer Center, New York, United States of America*

Objectives:

Typical Carcinoids (TCs) are uncommon slow-growing neoplasms, usually with high 5 and 10-year survival rates. As rare tumors, their management is still based on small clinical observations and no International Guidelines still exist. Based on the ESTS Neuroendocrine Tumors-Working-Group (NET-WG) Database, we evaluated factors that may influence mortality.

Methods:

Using the NET-WG database, an analysis on TC survival was performed. Overall Survival (OS) was calculated starting from the date of intervention. Predictors of OS were investigated using the Cox model with shared frailty (accounting for the within-center correlation). Candidate predictors were: gender, age, smoke habit, tumor location (peripheral vs central), previous malignancy, ECOG PS, pT, pN, TNM stage, tumor vascular invasion. The final model included predictors with $p \leq 0.15$ after a backward selection. Missing data in the evaluated predictors were multiple-imputed and combined estimates were obtained from 5 imputed datasets.

Results:

For 45 out of 1135 patients (4%) vital status was unavailable and analyses were thus performed on 1090 patients from 15 Institutions worldwide. During a median follow-up of 50 months, 87 patients died, with a 5 and 10 year OS of 99% and 98%, respectively. Final Cox model (Table 1) showed that mortality was confidently associated with age, male gender, previous malignancies, peripheral tumor, pT, pN and TNM stage. The final model showed a good discrimination ability with a C-statistic equal to 0.811. Finally, Figure 1 shows the calibration of the model, with a good agreement between the observed and predicted survival over the whole range of probabilities.

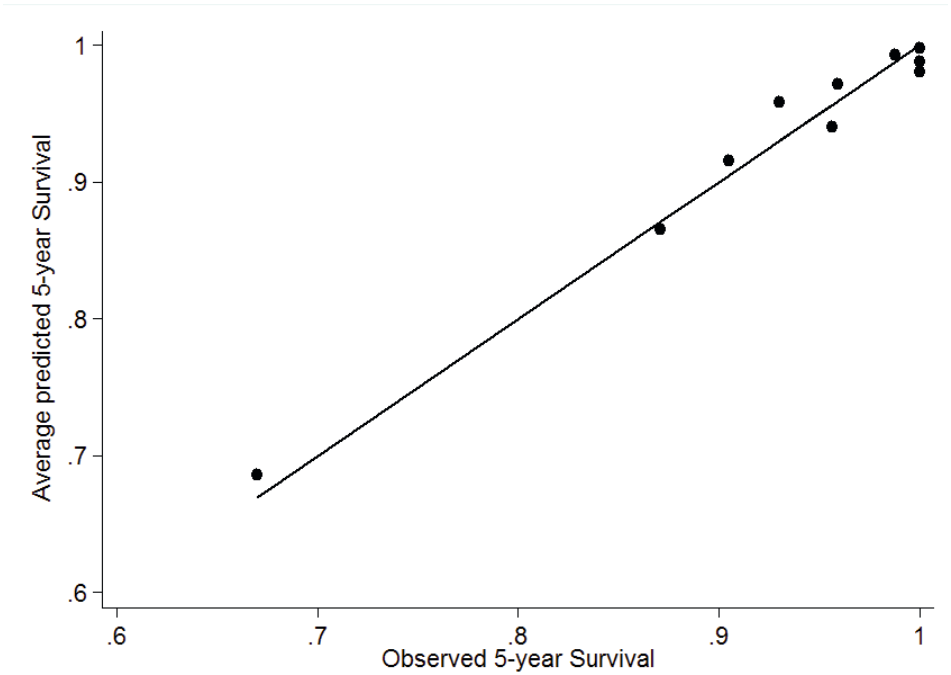
Conclusions:

We presented a promising prognostic model for survival of TC, showing a good calibration

and discrimination ability. Further analyses will be focused to validate this model, in order to provide eventually an interactive tool, as a nomogram, to facilitate clinical application.

Table 1. Overall Survival. Estimates of the final Cox model with shared frailty.

Predictor	HR (95%CI)
Age (per 1 year increase)	1.07 (1.05 to 1.1)
Male gender	2.03 (1.3 to 3.15)
Previous Malignancy	2.25 (1.41 to 3.59)
Peripheral (vs Central) tumor	1.77 (0.92 to 3.42)
pT	
T1 (ref)	1
T2	0.81 (0.39 to 1.69)
T3	1.06 (0.18 to 6.03)
T4	51.38 (3.88 to 679.8)
pN	
N0 (ref)	1
N1	0.76 (0.2 to 2.95)
N2	187.47 (6.73 to 5218.62)
Nx	0.92 (0.31 to 2.74)
TNM stage	
I (ref)	1
II	2.42 (0.76 to 7.68)
III	0.05 (0.00 to 1.06)
IV	24.55 (7.8 to 77.3)



Disclosure: No significant relationships.

B-005

PREVENTIVE ANALGESIA IN THORACIC SURGERY: A CONTROLLED, RANDOMIZED, DOUBLE BLINDED STUDY

Mario Nosotti, L. Rosso, D. Tosi, A. Palleschi, P. Mendogni, I. Righi, C. Marenghi,
L. Santambrogio
*U.O. Thoracic Surgery and Lung Transplant, Fondazione Cà Granda,
Ospedale Maggiore Policlinico, Milan, Italy*

Objectives:

Preventive analgesia is defined as a treatment that is commenced before the surgical operation in order to diminish the physiological consequences of afferent nociceptive transmission caused by the procedure and prevent central sensitization. The analysis of randomized studies of preventive analgesia is controversial. The aim of this study was to check the analgesic efficacy of preoperative administration of dextromethorphan associated with intercostal nerve block with levobupivacaine in thoracotomy patients who refused or have a contraindication to epidural analgesia.

Methods:

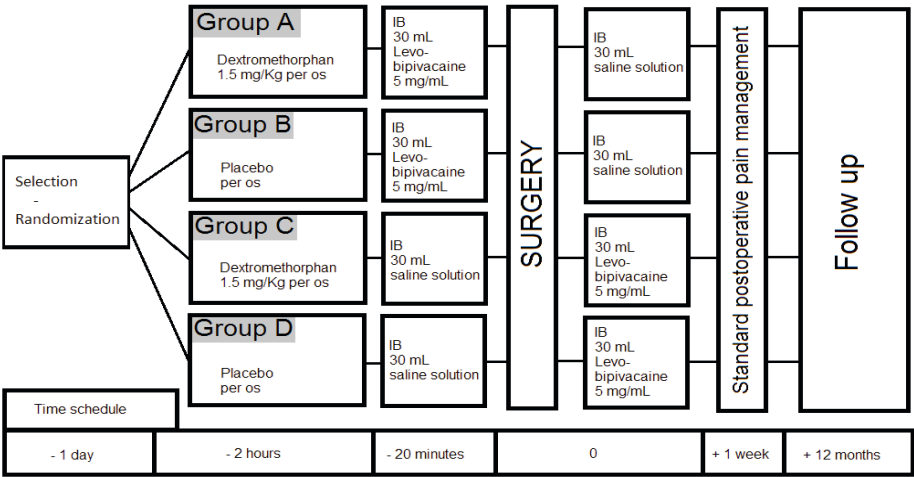
This study was a four armed, double blinded, randomized placebo-controlled trial. Patients were allocated following close block randomization into four arms: “group A” preoperative dextromethorphan and preoperative intercostal block, “group B” preoperative placebo and preoperative intercostal block, “group C” preoperative dextromethorphan and postoperative intercostal block, “group D” preoperative placebo and postoperative block. The primary endpoint was the cumulative morphine consumption within the first 14 days after surgery.

Results:

Four hundred patients were enrolled and 395 completed the study. There were no statistical differences among the groups in terms of demographic and surgical data; in contrast, preoperative quality of life scores were heterogeneous. The cumulative morphine consumptions were: group A 111.4 mg, group B 121.5, group C 126.8, group D 138.3. Group A mean was lower than the maximum ($p = 0.0001$, test power 0.93). The cumulative morphine consumption value did not correlated with age, sex, BMI, education, type of surgery, length or width of the incision and rib fracture. Postoperative functional data and post-thoracotomy syndrome prevalence were homogeneous; female gender resulted predictive for post-thoracotomy syndrome.

Conclusions:

Results indicate that preoperative administration of dextromethorphan associated with preoperative intercostal block with levobupivacaine provided preventive analgesia decreasing analgesic administration during the early postoperative period compared with placebo and/or postoperative intercostal block. This study failed in detecting any effect of preventive analgesia on functional items and post-thoracotomy syndrome.



Disclosure: No significant relationships.



B-006

LIVING-DONOR LOBAR LUNG TRANSPLANTATION PROVIDES SIMILAR SURVIVAL TO CADAVERIC LUNG TRANSPLANTATION EVEN FOR SICKER PATIENTS

Hiroshi Date, A. Aoyama, M. Sato, T. Yamada, K. Hijiya, T. Kondo, H. Motoyama, M. Takahashi, K. Ohata, F. Chen

Thoracic Surgery, Kyoto University, Kyoto, Japan

Objectives:

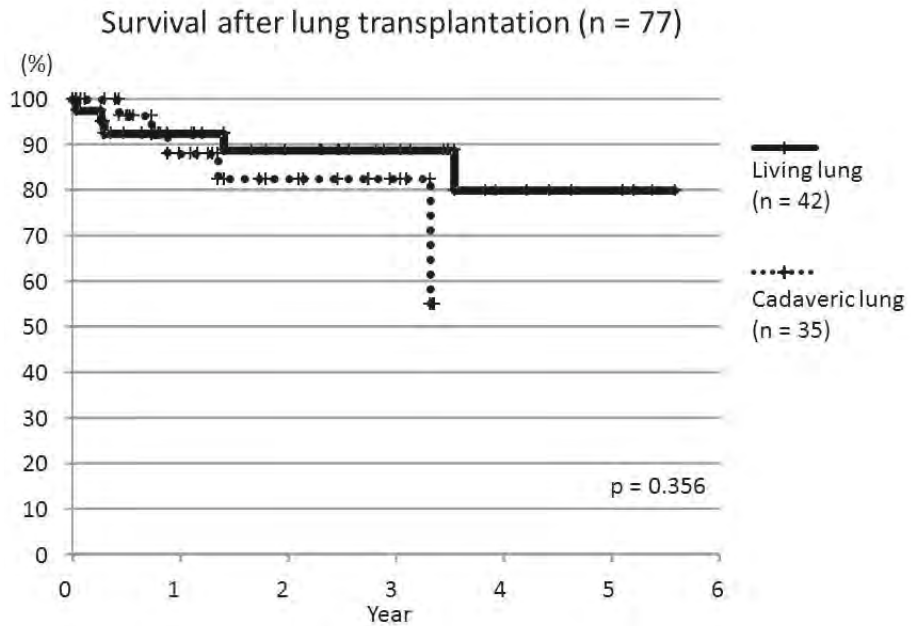
Living-donor lobar lung transplantation (LDLLT) has been performed as a life-saving procedure for critically ill patients who are unlikely to survive the long wait for cadaveric lungs. The purpose of this study was to compare preoperative condition and outcome of LDLLT with those of conventional cadaveric lung transplantation (CLT).

Methods:

A new lung transplant program was established in 2008 in our institution. Between June 2008 and January 2014, we performed 77 lung transplants including 42 LDLLTs (10 single and 32 bilateral), and 35 CLTs (21 single and 14 bilateral). The average waiting time for cadaveric donor was 761 days. All data were analyzed retrospectively as of January 2014.

Results:

LDLLT included 12 children (29%) and CLT included no children, however, the average age was similar (36.9 y vs 38.6 y, $p = 0.56$). Regarding the distribution of preoperative diagnoses, pulmonary fibrosis was more common in LDLLT than in CLT (42.9% vs 20.0%, $p = 0.03$). LDLLT included less walkable patients than CLT (42.9% vs 85.7%, $p = 0.0001$) and tended to include more ventilator dependent patients (11.9% vs 2.9%, $p = 0.14$). Duration of postoperative mechanical ventilation required was longer in LDLLT than in CLT (15.6 days vs 8.4 days, $p = 0.03$). However, one and three year survival rates were similar between the two groups (92.6% and 88.9% vs 88.0% and 82.5%, $p = 0.356$, Figure 1). All living-donors have returned to their previous life styles without restriction.

**Conclusions:**

Although preoperative recipient's condition was worse, LDLLT provided similar survival to CLT. LDLLT is a viable option for sick patients who would not survive a long waiting time for cadaveric donors.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**12:30 - 13:30****SESSION II: VIDEOS I****V-007****THE HILAR SIDE APPROACH TO THORACOSCOPIC S10 SEGMENTECTOMY**

Wataru Nishio, K. Tane, K. Uchino, M. Yoshimura

*Chest Surgery, Hyogo Cancer Center, Akashi, Japan***Objectives:**

As a general rule in the Hilar side approach to segmentectomy, we first separate the pulmonary arteries and bronchi then perform parenchymal dissection by following the inter-segmental veins. However, this procedure is not the most effective way to target the S10 segment. We would now like to present a surgical technique more relevant to thoracoscopic S10 segmentectomy.

Video description:

We would like to perform the Four-Port thoracoscopic approach to segmentectomy, in the same way as lobectomy. In this procedure we cut first between the S6 and S10 with an expanded and upward view from the hilar side, using the V6b & V6c as a guide. Then the B9+10, as well as A10 which pass through the inter lobe can be identified. This is particularly important because as the B9+10 branches diverge, the B10a branches act as a barrier and becomes difficult to secure the B10 without incision of the lung parenchyma. The next step is to secure the B10b+c after dissecting B10a. The anesthesiologist can inflate the S10 segment by jet ventilation using a bronchoscope, then finally we can dissect the B10b+c, A10 and V10. Afterwards, we finish the resection between the S9 and S10 by combining the hilar side approach of blunt dissection along the V9 from the inside and a sharp dissection of the demarcation line from the outside. As of April 2012 we have successfully performed five cases using this operative procedure. According to our process, dissection along the correct segmental border is possible.

Conclusions:

It is necessary to perform the S10 segmentectomy thoracoscopically prior to incision between the S6 and S10 from the hilar side, and next to resect between S9 and S10 by combining the hilar side approach of blunt dissection and a sharp dissection from the outside.

Disclosure: No significant relationships.

V-008

FULL THORACOSCOPIC MIDDLE LOBECTOMY WITH SLEEVE RESECTION FOR BULKY CARCINOID TUMOR

J. Dahdah, Dominique Gossot, M. Grigoriou, E. Brian
Thoracic, IMM, Paris, France

Objectives:

Video-assisted and thoracoscopic lobectomies are now frequently performed. However, sleeve resections are unusual, especially when performed via a full thoracoscopic approach, i.e. without utility incision. We report a case of full thoracoscopic middle lobectomy with sleeve resection for bulky carcinoid tumor.

Video description:

We report the case of a 35 years-old female patient presenting with haemoptysis from a bulky carcinoid tumour of the middle lobe protruding in the truncus intermedius. A middle lobectomy with sleeve resection was performed, using a full thoracoscopic approach, i.e. without utility incision. The resections margins were free. Final pathologic examination confirmed a typical carcinoid tumour pT1bN0. The patient was discharged at day 4, after an uneventful postoperative course. The main steps of the procedure are described. The slightly haemorrhagic atmosphere of the operation is due to vascular compression from the tumour. Comments of the procedure will be given live (no sound).

Conclusions:

Provided endoscopic suturing is mastered, performance of thoracoscopic sleeve resection can be done in selected patients.

Disclosure: No significant relationships.



V-009

THREE-PORT THORACOSCOPIC MEDIASTINAL LYMPH NODE DISSECTIONTadasu Kohno*Thoracic Surgery, Toranomon Hospital, Tokyo, Japan***Objectives:**

Thoracoscopic mediastinal lymph node dissection for lung cancer is still controversial. We are going to present the technique of 3-port thoracoscopic mediastinal lymph node dissection.

Video description:

Between 2004 and 2013, 1833 lung cancer resection were performed. Among them 1335 thoracoscopic lobectomies were performed. All the procedures were done completely by video monitor vision and through 3 incisions with the length of 7mm, 10mm and up to 30mm. Lymph node dissection for lung cancer is not only removing the lymph node but removing entire tissue in the area. The technique is then dissecting the surrounding organ. In right upper mediastinal lymph node dissection, the procedure was dissecting vagus nerve, azygos vein, right main pulmonary artery, SVC, brachiocephalic artery, subclavian artery and trachea. In left subcarinal lymph node dissection, the procedure was dissecting vagus nerve, esophagus, right pleura, right lower pulmonary vein, pericardium and bilateral bronchi. Other lymph node dissection was also performed with the same manner.

Conclusions:

The technique of three-port thoracoscopic complete mediastinal lymph node dissection for lung cancer is shown. This technique can be one of the option in thoracoscopic lung cancer surgery.

Disclosure: No significant relationships.

V-010

COMPLETE MANAGEMENT OF AN ANTERIOR SULCUS SUPERIOR TUMOUR BY VATS

Martin Reichert, S. Kerber, I. Alkoudmani, W.A. Stertmann, J. Bodner
*Department of General, Visceral, Thoracic, Transplant and Pediatric Surgery,
University Hospital of Giessen, Giessen, Germany*

Objectives:

Video-assisted thoracoscopic surgery (VATS) is a widely used technique for therapy of early stage bronchopulmonary carcinomas. Some evidence suggests feasibility and safety of VATS for extended pulmonary resections in advanced cancer but by now this technique alone has not been intended for management of sulcus superior tumors.

Video description:

We report a 56-year old female patient suffered from left sided anterior sulcus superior tumor, resected by using VATS after induction radio-chemotherapy. Technique: Three incisions were used for anterior approach-VATS. The total operation time was 285min, the one chest tube could be removed on the second, the patient left hospital on the sixth postoperative day. No intraoperative, no postoperative complications

Conclusions:

Through a growing experience extended pulmonary resections by VATS are safely feasible. We propose that even in cases of sulcus superior tumors, not invading vascular structures, the technique can be primarily used for resection of the tumor and chest wall.

Disclosure: No significant relationships.



V-011

ROBOTIC ASSISTED THYMOCTOMY IN A PATIENT WITH COMBINED THYMOMA AND THYMIC CYSTS

Chang Hyun Kang, Y. Hwang, I.K. Park, Y.T. Kim

Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea

Objectives:

To present a case in which robot-assisted thymectomy was performed successfully with a large-sized thymoma combined with thymic cyst.

Video description:

The role of minimally invasive surgery in advanced thymoma is unclear. Because of the risk of tumor rupture during the procedure, sternotomy and total thymectomy has been the standard operation. However, development of robot technology has made fine control and meticulous dissection of fragile tumor possible. Furthermore free articulation of robotic arm has great advantages especially for the dissection in narrow upper mediastinal space. We present a case of advanced thymoma combined with thymic cyst, which was successfully removed by robotic technique. Bilateral approach was tried and the tumor was removed successfully without breaching the tumor capsule. Combined thymic cyst was detected intraoperatively, however it was dissected en bloc fashion without spillage of content. Although left phrenic nerve was very close to the mass, it was successfully separated from main mass without any damage.

Conclusions:

Robot surgery would be an ideal minimally invasive technique for the operation in anterior mediastinum.

Disclosure: No significant relationships.

V-012

VATS INFERIOR BILOBECTOMYEdoardo Mercadante, D. Spoletini, U. Passaro, L. Frasca, M. Carlini*General and Thoracic Surgery, S. Eugenio Hospital, Rome, Italy***Objectives:**

Video Assisted Thoracoscopic Surgery (VATS) lobectomy has widely become accepted as a safe and effective technique to treat early stage non small cell lung cancer. Despite the increasing amount of literature focused on technical aspects of VATS lobectomy, few reports deal with the surgical steps and technical details of VATS bilobectomy. The video shows an inferior bilobectomy performed with a three ports standard anterior VATS approach.

Video description:

A 74-year-old woman was admitted to our Department for a right lower lobe adenocarcinoma with satellite nodules in the middle lobe. After functional evaluation the patient was considered suitable for VATS bilobectomy. In the video, a 4 cm incision is made in the 5th intercostal space, anterior to the latissimus dorsi muscle, and two 1 cm incisions are added inferiorly. Pulmonary inferior ligament is dissected with the hook until visualization of the inferior pulmonary vein (IPV), thus, as the middle lobe vein (MLV) is in line with the IPV, the MLV is prepared and stapled earlier. The anterior fissure is then completed to allow the middle lobe artery branches and the truncus intermedius to be exposed and stapled. Therefore, the bronchus intermedius is finally prepared and stapled. Bilobectomy is completed with the posterior main fissure section. After removal of the specimen, lymph node dissection is performed and a single chest tube is placed. Operating time was 150 minutes. Post operative course was uneventful, the chest tube was removed in the third post operative day and the patient discharged the day after.

Conclusions:

VATS lobectomy is nowadays a well define surgical technique whose diffusion is worldwide increasing. This video shows that VATS bilobectomy for NSCLC is a safe and effective procedure in Centers with experience in VATS lobectomy and it results in rapid post operative recovery as for standard VATS lobectomy.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**13:30 - 15:00****SESSION III: PULMONARY NON NEOPLASTIC****O-013****AN INDIVIDUALISED RISK MODEL OF MORTALITY FOLLOWING LUNG VOLUME REDUCTION SURGERY**Paul Vaughan¹, N. Greening², I. Oey¹, S. Rathinam¹, D. Waller¹¹*Thoracic Surgery, Glenfield Hospital, University Hospitals of Leicester, Leicester, United Kingdom*²*Respiratory Medicine, Glenfield Hospital, Leicester, United Kingdom***Objectives:**

The physiological and health-status benefits of Lung Volume Reduction Surgery(LVRS) are well established, but the uptake has been lower than expected due to concerns over operative mortality. We aimed to construct a model to better quantify these risks and thus instruct decision-making

Methods:

Variables associated with 30-day, 90-day and 1 year mortality were assessed in 237 patients undergoing unilateral VAT LVRS over a 17 year period. Logistic regression was used to construct a scoring system to predict perioperative(90-day) mortality, and reliability assessed by receiver operating characteristics(ROC) analysis.

Results:

30-day mortality was 4.2%(10/237); 8.9%(21/237) at 90 days and 11.8%(28/237) at 1 year. The causes of death included: respiratory failure, myocardial infarction. Reduced survival at 90-days was associated with body mass index(BMI) <18.5Kg/m²(OR 3.14, 95%CI 1.04-9.47, p=0.042), absolute FEV1 <0.71L(OR 5.47 95%CI 1.47-20.35, p=0.011), and DLCO <20%(OR 5.56 95%CI 1.17-26.34, p=0.03). The mortality risk model derived from these variables showed good discrimination between low/moderate/high risk groups(p<0.001) at all time points with a high degree of reliability(c=0.797). There was no early mortality in the 94 patients in the low risk group, and only 1 death in the first year. In the high risk group 30-day mortality was 5/35 patients(14%), rising to 13/35(37%) at 1 year.

Conclusions:

There is significant variability in perioperative mortality after VAT LVRS. Individualised mortality risk can be predicted using the simple score derived from perioperative characteristics. Increased utilisation of LVRS may be encouraged by more accurate patient information.

Disclosure: No significant relationships.

O-014

ASSESSING TEAM PERFORMANCE IN LUNG RESECTION: TIME SERIES BETTER THAN CROSS-SECTIONAL ANALYSIS

Gonzalo Varela, M. Rodríguez, M.T. Gómez-Hernández, M.F. Jiménez, N. Novoa, J.L. Aranda

Thoracic Surgery, Salamanca University Hospital, Salamanca, Spain

Objectives:

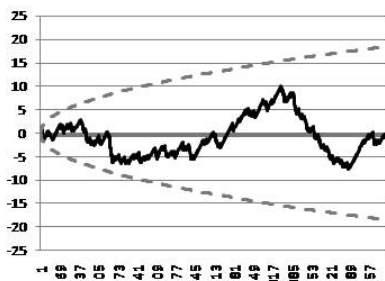
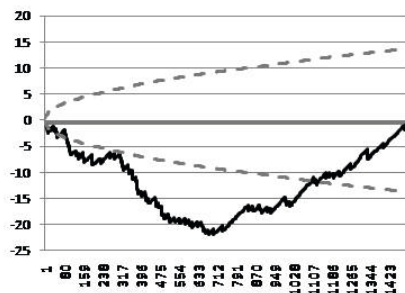
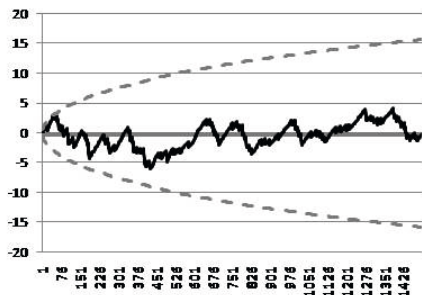
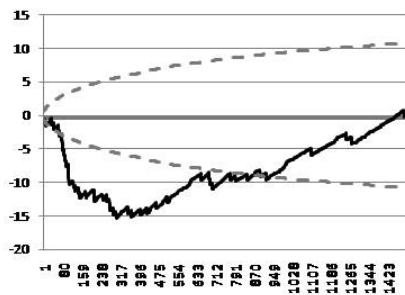
The performance in lung resection is usually evaluated according to the rates of crude or risk-adjusted rates of adverse events in cross-sectional analysis. The objective of this study is reporting the graphical assessment of team performance using CUSUM curves constructed on time series.

Methods:

The occurrence of the 3 most prevalent postoperative complications (nosocomial pneumonia, atrial fibrillation, and prolonged air leak) and 30-day mortality was retrospectively reviewed on a series of 1501 lung cancer patients who underwent curative resection. All complications were prospectively recorded according to previously defined criteria. Overall prevalence of each complication was calculated first. Then, predictive models for each complication and mortality were constructed using clinical and functional parameters (age, BMI, type of resection, spirometry values). The individual probability of each adverse event was calculated and the performance (C-index) of the models was calculated in ROC curves. Individual risk values were used to construct 95% risk-adjusted CUSUM curves.

Results:

The series consisted in 277 pneumonectomies, 104 bilobectomies, 1075 lobectomies and 45 anatomical segmentectomies. Overall prevalence of each complication was: pneumonia 5.1%, atrial fibrillation 6.9%, air leak 12.1%, 30-day mortality 3.1%. C-indexes of the predictive models were: 0.75 for 30-day mortality; 0.69 for atrial fibrillation; 0.71 for pneumonia and 0.65 for prolonged air leak. Constructed CUSUM graphs are presented in Figure 1 (A: prolonged air leak; B: pneumonia; C: atrial fibrillation; D: 30-day mortality). Changes in performance can be seen along the period of the study. After initial bad performance in pneumonia and mortality rates, implemented changes in lung resection process were followed by considerable improvements in quality.

A

B

C

D


Conclusions:

The analysis of the team's performance on time series using CUSUM graphs gives better idea of the quality of surgery and allows for better monitoring of the effects of implementing improvements in the process of patients' care.

Disclosure: No significant relationships.

O-015

ASSESSMENT OF THE AGGREGATE RISK SCORE TO PREDICT MORTALITY AFTER SURGICAL BIOPSY FOR INTERSTITIAL LUNG DISEASE

N. Rotolo¹, Andrea Imperatori¹, A. Poli², E. Nardecchia¹, M. Castiglioni¹, M. Cattoni¹, L. Dominioni¹

¹*Center for Thoracic Surgery, University of Insubria, Varese, Italy*

²*Department of Public Health and Community Medicine, University of Verona, Verona, Italy*

Objectives:

An aggregate risk score (range: 0-6 points) for predicting mortality after surgical biopsy for interstitial lung disease (ILD) was recently developed from four independent variables: ICU treatment (2 points), age >67 years (1.5 points), immunosuppression (1.5 points), open biopsy (1 point). In the development cohort, patients were grouped in four classes of aggregate score (A,B,C,D) showing incremental risk of death within 90 days from biopsy (Fibla J.J. et al. *Interact. Cardiovasc. Thorac. Surg.* 2012;15:276). We tested this mortality risk model in an independent cohort.

Methods:

The aggregate risk score and the corresponding class of 90-day mortality risk was retrospectively determined in 151 consecutive patients undergoing VATS biopsy for uncertain ILD at our institution in 1997-2012 (Table). We evaluated by Spearman rho test the correlation between aggregate risk score and mortality rate in the development cohort and in our cohort. Fischer exact test was used for comparison of overall mortality rate between the two cohorts.

Results:

The mortality rate correlation with risk score differed in our cohort ($\rho=0.127$; $p=0.06$) compared to the development cohort ($\rho=0.352$; $p<0.0001$). In our dataset mortality polarized: it was minimal in class A and B (2% and 0% respectively), 33% in class C and D (Table). This skewed mortality distribution was possibly contributed to by significantly lower overall mortality rate in our cohort than in the development cohort (3% vs. 11%; $p=0.0017$). Despite difference of mortality distribution, in our dataset we validated that ILD patients with aggregate score >2 (class C and D) were at exceedingly high risk of postoperative mortality.

		Development cohort (n=311)	Our Cohort (n=151)
Aggregate risk score	Class	N. of deaths/ patients at risk	N. of deaths/ patients at risk
0	A	3/146 (2%)	2/110 (2%)
1 - 2	B	16/138 (12%)	0/35 (0%)
2.5 - 3	C	8/20 (40%)	1/3 (33%)
> 3	D	6/7 (86%)	1/3 (33%)
	Total	33/311 (11%)	4/151 (3%)

Conclusions:

The aggregate score is a useful risk score for ILD. Our dataset confirms that VATS lung biopsy is reasonably safe in class A and B patients, while in class C and D patients it is indicated only if histology would substantially change management and prognosis.

Disclosure: No significant relationships.

O-016

DOES POSTPNEUMONECTOMY EMPYEMA IMPROVE LONG-TERM SURVIVAL IN PATIENTS WITH LUNG CANCER?

J. Wójcik¹, B. Kubisa¹, J. Pieróg¹, K. Safranow², L. Kochanowski¹, J. Alchimowicz¹,
N. Wójcik¹, Tomasz Grodzki¹

¹*Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland*

²*Pharmacology, Pomeranian Medical University, Szczecin, Poland*

Objectives:

Postpneumonectomy empyema (PPE) is life-threatening morbidity. PPE affects 1-10% of patients with 9-13% mortality risk. Treatment is long and prognosis is unsure. Phenomenon of survival benefit in the group of patients with lung cancer and pleural empyema was described 40 years ago. We tried to assess this kind of relationship in the PPE-group.

Methods:

The study involved the group of 38 patients who underwent pneumonectomy followed by PPE in 1995-2007 (7 females, 31 males, median age 62). 35 patients of the group were diagnosed as lung cancer (NSCLC). 31 NSCLC PPE patients were matched with the group of 31 NSCLC patients who underwent uncomplicated pneumonectomy in the same center in 1997-2009. Both groups didn't differ significantly regarding sex, age, histology, TNM, FEV1, major comorbidities and neoadjuvant or adjuvant therapy. Propensity score matching, log-rank, Cox proportional hazard model, Kaplan-Meier curves, Wilcoxon and McNemar tests were used in statistical analysis. PPE group was treated by repeated pleural debridement and lavage.

Results:

35/38 PPE patients (92.1%) were treated successfully. 5- and 10-years survival in the all PPE patients was 69% and 51% respectively. Observation regarding matched groups revealed better long term survival in the PPE group (70% and 49%) versus the group without PPE (38% and 18%). Comparison of the matched groups revealed longer survival for all-cause mortality ($p=0.0048$) and lower incidence of cancer-unrelated mortality ($p=0.024$) in the PPE group. The difference of cancer-related mortality was not significant between groups ($p=0.092$).

Conclusions:

Follow-up results of NSCLC patients with PPE demonstrate better long term survival in comparison to the results for the NSCLC group who underwent uncomplicated pneumonectomy.

Disclosure: No significant relationships.

O-017

PNEUMONECTOMY FOR BENIGN DISEASE: INDICATIONS AND POSTOPERATIVE OUTCOMES, A NATIONWIDE STUDY

Caroline Rivera, A. Arame, G. Mangiameli, C. Pricopi, A. Badia, M. Abdennadher, F. Le Pimpec Barthes, M. Riquet
General Thoracic Surgery, Georges Pompidou European Hospital, Paris, France

Objectives:

Pneumonectomy for benign disease is rare but may generate more postoperative morbidity than when performed for lung cancer. We questioned this assessment analysing indications and postoperative outcomes of patients who underwent this type of resection.

Methods:

We used Epithor, the French national thoracic database including by now 91 public and private institutions and more than 220 000 procedures. We prospectively collected data on 5,975 patients who underwent pneumonectomy between January 2003 and June 2013. The 321 patients (5.4%) who underwent pneumonectomy (n=201) or completion pneumonectomy (n=120) for benign disease were compared to patients treated for malignant disease.

Results:

Patients' mean age [95% CI] was 55.2 years [53.5;56.8] for benign indications vs 61.6 years [61.4;61.9] for malignant disease, sex ratio was 1.8 (207 males) and 4 (4,543 males) respectively, 53% of patients (n=169) had an ASA score ≥ 3 vs 29% (n=1598) for malignant disease. For benign disease, most frequent indications were infection or abscess (n=114, 37.1%), post-tuberculosis destroyed lung (n=47, 15.3%), aspergillosis or aspergilloma (n=33, 10.7%), bronchiectasis (n=41, 13.3%), haemorrhage (n=26, 8.5%) and benign tumour (n=20, 6.5%). Complications occurred in 53% (n=170) of patients and postoperative in-hospital mortality was 22.1% (n=71). These results were significantly worse than those for malignant indications: 38.9% (n=2,198) of morbidity ($p<0.0001$) and 5.1% (n=288) of in-hospital mortality ($p<0.0001$). For benign disease, there was no difference in fistula formation regarding side ($p=0.07$) or type of resection ($p=0.6$). Morbidity was higher for completion pneumonectomy: 62.5% vs 47.3% ($p=0.008$). Mortality was significantly higher for patients whose resection was for infection or abscess ($p=0.01$) and for haemorrhage ($p=0.002$). Emergency procedures were associated to worse postoperative outcomes ($p<0.0001$).

Conclusions:

Pneumonectomy for benign disease achieves cure with very high levels of morbidity and mortality. This type of surgical treatment should be considered as a salvage procedure.

Disclosure: No significant relationships.

O-018

PREOPERATIVE CARBON MONOXIDE TRANSFER COEFFICIENT (KCO%) PREDICTS DYSPNEA ON EXERTION AT LONG-TERM AFTER LUNG CANCER SURGERY

Rafael Aguilo¹, A. Mayoral², A. Rodriguez-Fuster¹, J. Belda-Sanchis¹, Q. Gea²

¹*Thoracic Surgery, Hospital Universitari del Mar, Barcelona, Spain*

²*Pneumology, Hospital Universitari del Mar, Barcelona, Spain*

Objectives:

Our study was directed at searching any preoperative pulmonary function parameter useful in predicting the onset of long-term postoperative intolerance to exertion in patients submitted to surgery for lung cancer.

Methods:

Patients had to be cancer-free, and at least one year should have elapsed since the operation to recruitment. Pulmonary resection had to be a lobectomy or bilobectomy. Measurements: Pre- and postoperatively, pulmonary function tests and arterial blood gases analysis. Tolerance to exertion was assessed postoperatively by the six minutes walking test. During walking, any fall of 4 percent units or higher of saturated hemoglobin from baseline at rest was considered abnormal. Study groups: Group A (n=20): No abnormal desaturation at walking. Group B (n=21): Abnormal desaturation at walking.

Results:

Male to female ratio, 3:1; both groups. Age, years: Group A: 70±7; Group B: 69±9; p=NS. The table shows the results of the six minutes walking test.

Six Minutes Walking Test	Group A n = 20	Group B n = 21	Two tailed “t” test
Distance walked (meters)	433±107	380±116	p = 0.16
Distance walked (%)	88±25	82±28	p = 0.50
Dyspnea (Borg scale 0 – 10)	1±2	4±3	p < 0.001
Leg fatigue (Borg scale 0 – 10)	1±2	2±3	p = 0.53
Post-operative (A-a)PO ₂	8±8	17±11	p < 0.01

The univariate analyses showed that preoperative K_{co}% was the unique variable presenting significant differences between groups (Group A: 91±21, Group B: 75±20; p=0.02). The receiver operating characteristics analysis showed that the optimal cut-off point of preoperative K_{co}% with respect to postoperative hemoglobin desaturation at walking was 90%, with a sensibility of 76%, and a specificity of 67%. The area under the curve (confidence interval, 95%) was 0.73 (0.57 – 0.89). (*)All results are shown as mean ± SD. (A-a)PO₂ = Alveolus to artery pressure gradient.



Conclusions:

An unexpectedly high percentage (21/41) of our patients presented intolerance to exertion at long-term postoperatively, after full recovery from surgery for lung cancer. Preoperative KCO% lower than 90% predicted postoperative hemoglobin desaturation at exertion, at long-term after surgery.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**14:00 - 15:30****SESSION IV: YOUNG INVESTIGATOR AWARD****F-019****VALIDATION OF INDEX OF PROLONGED AIR LEAK SCORE IN CASE OF VATS ANATOMICAL LUNG RESECTION. RESULTS OF A NATIONWIDE STUDY FROM THE FRENCH NATIONAL THORACIC DATABASE, EPITHOR**

Bastien Orsini¹, J.M. Baste², D. Gossot³, J.P. Berthet⁴, J. Assouad⁵, M. Dahan⁶, A. Bernard⁷, P. Thomas¹

¹*Thoracic Surgery and Esophagus Diseases, Assistance Publique des Hopitaux de Marseille - Université de la Méditerranée, Marseille, France*

²*Thoracic Surgery, Rouen Hospital, Rouen, France*

³*Thoracic, IMM, Paris, France*

⁴*Thoracic and Vascular Surgery, Hospital Arnaud de Villeneuve, Montpellier, France*

⁵*Thoracic Surgery, Assistance Publique des Hopitaux de Paris - Tenon Hospital, Paris, France*

⁶*Thoracic Surgery, Larrey Hospital, Toulouse, France*

⁷*Thoracic and Vascular Surgery, Bocage Hospital, Dijon, France*

Objectives:

Incidence of prolonged air leak after lobectomy defined as an air leak longer than 7 days can be estimated between 6% and 13% depending centers. The Epithor group has elaborated, in 2011, a predictive score for prolonged air leak called IPAL (Index of Prolonged Air Leak) from a studied population operated between 2004 and 2008. Actually, video assisted thoracic surgery (VATS) was largely developed in France to reach about 12% of lobectomies. This new procedure was well described to permit reduction in length of drainage essentially due to fissureless lobectomy technic. The aim of our study is to validate IPAL score in case of VATS anatomical lung resection.

Methods:

From the national thoracic surgery prospective database EPITHOR, we extracted the anatomical lung resections (lobectomy and segmentectomy) performed by VATS in case of malignant and benign lesions. The area under ROC curve estimated the discriminating value of IPAL score. The slope of the right and its constant described the relation between the predicted and observed probability. The Hosmer-Lemeshow test was also used to estimate quality of adequacy between predicted and observed probability.

Results:

From 2005 to 2012, 1387 patients were included. 1159 (83,5 %) lobectomies were performed versus 228 (16,5 %) segmentectomies. In 1224 cases (88,2 %) resection was performed for malignant lesion. Hundred and six patients (7,6 %) presented a prolonged air leak. IPAL score presents a good predictive value with an area under the curve ROCK of 0.73 (0.68 - 0.77). The



value of the slope, 1.29 (0.9 - 1.6), and the Hosmer-Lemeshow test ($X^2 = 13.6$ $p < 0.14$) show that probability predicted by IPAL score has a satisfactory adequacy with probability observed on the sample.

Conclusions:

Our study demonstrates that IPAL score can be used to evaluate predictive risk of prolonged air leak in case of VATS anatomical lung resection.

Disclosure: No significant relationships.

F-020

ROLE OF CYTOKINE PROFILE IN THE DIFFERENTIAL DIAGNOSIS BETWEEN CLINICAL ACUTE LUNG REJECTION AND PULMONARY INFECTIONS AFTER LUNG TRANSPLANTATION

Miriam Patella¹, M. Anile¹, D. Diso¹, P. Del Porto², Y. Pecoraro¹, I. Onorati¹, S. Mantovani¹, T. De Giacomo¹, F. Ascenzioni², F. Venuta¹

¹*Thoracic Surgery, University of Rome Sapienza, Rome, Italy*

²*Biology and Biotechnology, University of Rome Sapienza, Rome, Italy*

Objectives:

Acute lung rejection (ALR) is a relatively frequent condition during the first year after lung transplantation (LT). It is characterized by perivascular/bronchial mononuclear inflammation mediated by several cytokines. Our aim was to monitor during the first year post LT a panel of cytokines extracted by the bronchoalveolar lavage (BAL) and correlate the levels to clinical ALR.

Methods:

Twenty double lung transplant recipients were prospectively assessed. Fifteen (75%) were affected by cystic fibrosis (CF). The plan of the study was to collect samples of BAL at 7 different steps (pre-transplant, post-transplant, 1 week, 1, 3 and 6 months and 1 year). A panel of 6 cytokines was analyzed [Tumor Necrosis Factor alfa (TNF- α), Interleukin 1 beta (IL-1 β), Interleukin 6 (IL-6), Interleukin 8 (IL-8), Macrophage Inflammatory Protein 1 alfa (MIP-1 α) and Interleukin 10 (IL-10)]. We correlated the cytokine levels with clinical ALR episodes, bacterial and cytomegalovirus (CMV) infections.

Results:

One-hundred-thirty-three BAL samples were collected and analyzed (95%). In CF patients the levels of pro-inflammatory cytokines significantly dropped in the post-transplant sample; they increased in the others patients. Four patients (27%) died during the first year (all 6 months after surgery). Nine patients (45%) showed one clinical ALR episode within 6 months, in 6 (30%) a bacterial pneumonia was diagnosed and 5 (25%) developed CMV infection. No differences with the complication rate between CF and non-CF patients were observed. During the infection episodes all pro-inflammatory cytokines increased consensually with low levels of IL-10; in case of ALR, levels of IL-1 β and MIP-1 α increased significantly ($p=0.01$ and $p<0.0001$), IL-10 levels were higher compared to the infection episodes ($p=0.03$). No significant changes were observed for TNF- α , IL-6 and IL-8.

Conclusions:

Cytokines profile analyzed in the BAL (IL-1 β , MIP-1 α and IL-10) seems useful in the differential diagnosis between clinical ALR and infections.

Disclosure: No significant relationships.

F-021

IS IT SAFE TO PERFORM COMPLETION LOBECTOMY USING VIDEO-ASSISTED THORACOSCOPIC SURGERY?

Bo Laksáfoss Holbek, R.H. Petersen, H.J. Hansen

Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark

Objectives:

To compare the short term surgical outcome and complications after video-assisted thoracoscopic surgery (VATS) completion lobectomy for primary lung cancer after VATS diagnostic wedge resection with VATS non-completion lobectomy.

Methods:

Data was retrieved from a prospective institutional database of consecutive VATS lobectomies between January 1st 2007 and December 31st 2013. Patients were grouped into VATS completion lobectomy or VATS non-completion lobectomy. OR time, perioperative blood loss, chest tube duration, prolonged air leak >7 days and length of stay was compared between the two groups using Student's t test for statistical analysis.

Results:

In total 82 VATS completion lobectomies and 1174 VATS non-completion lobectomies were performed. For completion lobectomies vs. non-completion lobectomies mean OR time was 121 vs. 121 min. ($p=0.91$), mean perioperative bleeding was 164 vs. 136 ml ($p=0.19$), mean chest tube duration was 4.1 vs. 4.4 days ($p=0.67$), mean length of stay was 5.5 vs. 6.0 days ($p=0.44$). In the completion lobectomy group there were 12 patients with prolonged air leak >7 days (PAL) (14.6 %) compared to 176 (15.0 %) in the non-lobectomy group (table 1).

Table 1. Surgical outcome from VATS completion lobectomy and VATS non-completion lobectomy

	VATS completion lobectomy (n = 82)	VATS non-completion lobectomy (n = 1174)	P
Mean OR time, min.	121	121	NS*
Mean bleeding, ml.	164	136	NS
Mean chest tube duration, days	4.1	4.4	NS
Mean LOS, days	5.5	6.0	NS
PAL >7 days, no. of patients (%)	12 (14.6 %)	176 (15.0 %)	NS

*Non-significant

Conclusions:

In our data there was no significant difference between VATS completion lobectomy and VATS non-completion lobectomy when comparing OR time, perioperative bleeding, chest tube duration length or stay and PAL >7 days indicating the safety and feasibility of VATS completion lobectomy.

Disclosure: R.H. Petersen: Speaker for Covidien. H.J. Hansen: Speaker for Covidien.

F-022

EXPRESSION OF RECEPTOR FOR HYALURONIC ACID-MEDIATED MOTILITY (RHAMM, CD168) IS AN UICC STAGE INDEPENDENT PREDICTOR OF POOR OUTCOME FOR LARGE CELL CARCINOMASFlorian Augustin¹, T. Schmid¹, W. Sterlacci², M. Fiegl³, J. Pratschke¹, A. Tzankov⁴¹*Department of Visceral, Transplant and Thoracic Surgery;**Innsbruck Medical University, Innsbruck, Austria*²*Pathology, Klinikum Bayreuth, Bayreuth, Germany*³*Department of Internal Medicine, Innsbruck Medical University, Innsbruck, Austria*⁴*Pathology, University Hospital Basel, Basel, Switzerland***Objectives:**

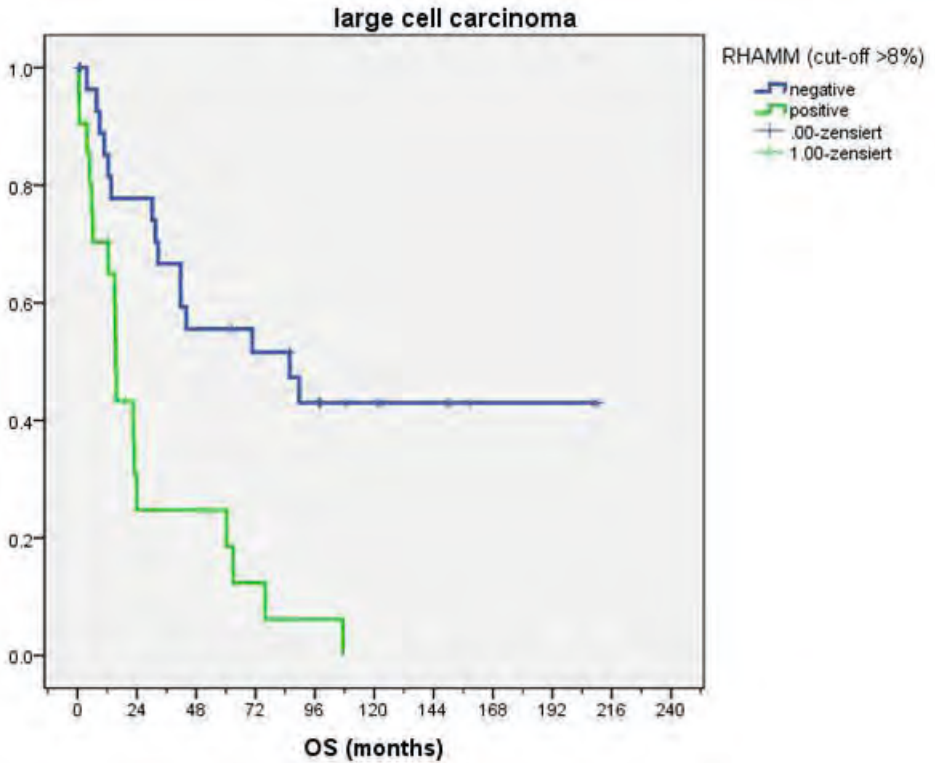
The cell surface receptor for hyaluronic acid-mediated motility (RHAMM) has been identified as an important anti-apoptotic factor of prognostic significance in carcinomas. RHAMM interacts with CD44, a cell surface protein that regulates migration, proliferation and apoptosis. The current study was performed to analyze the prognostic significance of RHAMM, CD44 variant isoform 6 (CD44v6) and their interacting molecules in non-small cell lung cancer (NSCLC).

Methods:

Immunohistochemistry for CD44v6, Osteopontin, RHAMM, P-glycoprotein, CD95 and Caspase 3 were performed in 383 well characterized surgically resected lung cancer specimens using a tissue microarray. Optimal cutoff values were established by receiver operating characteristic curves. Extensive clinical data and a follow up of more than 15 years enabled detailed correlations.

Results:

RHAMM expression in the subgroup of large cell carcinomas (LCC) was associated with inferior survival ($p=0.000223$). Median overall survival was 92 vs 18 months for RHAMM negative and positive patients, respectively. (Figure 1) The difference was also significant in the nodal negative and positive subgroups (N0: $p=0.013$, N+: $p=0.007$). P-glycoprotein expression was associated with inferior survival in adenocarcinomas ($p=0.013$) and appeared to be a pUICC stage and gender independent prognostic factor, irrespective of adjuvant chemotherapy, in the multivariable analysis. Figure 1: Prognostic effect of RHAMM expression on overall survival in large cell carcinoma patients, $p=0.000223$



Conclusions:

Analysis of RHAMM expression is a valuable predictor of survival in LCC. RHAMM positive patients may benefit from adjuvant therapy even in early nodal negative stages. Expression of P-glycoprotein identifies a subset of patients with poor outcome independent of stage, gender and adjuvant chemotherapy.

Disclosure: No significant relationships.

F-023

REPEATED LUNG VOLUME REDUCTION SURGERY IS SUCCESSFUL IN SELECTED CASES

Arthur Kostron¹, D. Franzen², I. Opitz¹, D. Schneiter¹, M. Kohler², W. Weder¹

¹*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*

²*Division of Pulmonology, Zurich, Switzerland*

Objectives:

Lung volume reduction surgery (LVRS) is a successful palliative therapy for carefully selected patients with end-stage emphysema. The benefit maybe sustained for several years. The aim of this study was to evaluate the effects and outcome of redo LVRS in patients who did not benefit anymore from their initial bilateral LVRS.

Methods:

In the last 10 years 21 patients (8 females) with advanced emphysema underwent Re-LVRS after 60 months (range: 25-196) following their initial LVRS. Re-LVRS was performed unilaterally by video-assisted thoracoscopic technique in 19 patients and in two patients by mini-thoracotomy due to adhesions. The patient's characteristics and pulmonary function data are summarized in table 1.

Results:

Lung function was similar at the time of Re-LVRS compared to the time of prior to the first LVRS (table 1). There was no perioperative death. The first patient died 15 months post-operatively. The median hospitalization time was 14 days (range: 6 - 59). The most frequent complication was prolonged air leak with a median drainage time of 9 days (range: 3 - 32) with 7 necessitating reoperations. 5 patients did not have any complications. Lung function and dyspnea score (MRC breathlessness scale) improved significantly for up to twelve months after Re-LVRS. Table 1 (mean ± Standard Error, *= $p < 0.05$: compared to preoperative values)

Parameter	pre LVRS	3 months after LVRS	12 months after LVRS	pre Re-LVRS	3 months after Re-LVRS	12 months after Re-LVRS
Age	59±7			65±1.5		
Drainage time	8±1.2			11±1.7		
FEV1 [L]	0.79±0.04	1.3±1.0*	1.03±0.1*	0.77±0.04	0.9±0.06*	0.9±0.1*
FEV1 [%]	27±1.8	45±2.9*	36±3.5*	27.3±2.1	33.1±2.7*	31±2.6*
RV [L]	5.60±1.3	3.9±0.2*	4.2±0.3*	5.6±0.3	4.3±0.5*	4.2±0.4*
RV [%]	256±58	181±9.3*	185±11*	235±15	187±2.5*	168±28*
TLC [L]	7.7±0.3	7.7±0.3*	7.8±0.4*	7.7±0.4	7.23±0.4*	7.4±0.8*
TLC [%]	125±5	124±3.1*	127±3.4*	133±5.1	117±7.9*	112±10*
RV/TLC	0.66±0.01	0.52±0.01*	0.53±0.02*	0.67±0.02	0.62±0.02*	0.55±0.03*
DLCO [%]	44±4	48±3.0*	47±2.7*	36±2.5	33±2.2*	41±6*
MRC scale [1-5]	3.3±0.1	0.8±0.2*	1.4±0.26*	3.7±0.1	2.1±0.2*	1.0±0.7*

Conclusions:

Re-LVRS can be performed successfully in carefully selected patients with an acceptable morbidity and may lead to satisfactory outcome with significantly improved lung function and dyspnea for at least 12 months postoperatively.

Disclosure: No significant relationships.

F-024

PAIN AND RECOVERY AFTER SINGLE PORT OR MULTIPLE PORT VATS LOBECTOMY: A COMPARISON STUDYPhilip McElnay¹, D. West¹, T. Batchelor¹, R. Krishnadas¹, M. Molyneux², G. Casali¹¹*Department of Thoracic Surgery, University Hospitals Bristol NHS Foundation Trust, Bristol, United Kingdom*²*Department of Anaesthesia, University Hospitals Bristol NHS Foundation Trust, Bristol, United Kingdom***Objectives:**

VATS lobectomy is usually performed using 3 or 4 ports. The use of a single port has been described in some recent case series. Few comparison studies between uniport and multiport VATS lobectomy exist. The aim of this study was to determine whether the uniport technique has more favourable post-operative outcomes.

Methods:

All VATS lobectomies undertaken at a single university hospital between August 2012-December 2013 were studied. The choice of approach was decided by the operating surgeon. Patients with pre-operative chronic pain or opiate use were excluded. Patients were divided into uniport and multiport approaches for analysis. Continuous data were analysed by Mann-Whitney and t-tests as appropriate, continuous data by Fisher's exact test.

Results:

129 VATS lobectomies were completed. 6 were excluded and data was incomplete for 13, leaving 110 (15 uniport, 96 multiport) for analysis. Demographics and outcomes are illustrated in the table below:

	Uniport (n=15)	Multiport (n=95)	P-value
<u>Demographics</u>			
Gender (M:F)	8:7 (53% male)	49:46 (52% male)	1.0
Median age (years)	70.9 (66.4, 77.0)	69.4 (61.3, 74.5)	0.41
Logistic Thoracoscore	1.9% (1.3, 2.5)	1.5 (1.0, 2.2)	0.39
<u>Outcomes</u>			
Median morphine use first 24 hours	19 (18, 29.4)	23 (18.6, 30.1)	0.84
Median Visual Analogue pain Score in first 24 hours	0 (0, 0.7)	0 (0, 1)	0.65
Median PCA duration (days)	1 (1, 1)	1 (1, 1)	0.97
Median chest drain duration (days)	2 (1.0, 3.7)	2 (2,3)	0.67
Median in-hospital stay (days)	4 (3, 5)	4 (3,5)	0.54
Further procedure on admission	1 (6.7%)	0 (0%)	0.14
In-patient mortality	0 (0%)	0 (0%)	1.0



Conclusions:

Uniport VATS lobectomy is safe. It has no appreciable negative impact on hospital stay or morbidity. Patient-reported pain and morphine use in the first twenty-four hours is low with both techniques. Larger prospective randomised studies are needed to quantify any benefit to a particular approach for VATS lobectomy.

Disclosure: No significant relationships.

F-025

PROGNOSTIC FACTORS IN PULMONARY CARCINOID CAUSING CUSHING'S SYNDROME: A MULTICENTRE ANALYSIS

Filippo Lococo¹, S. Margaritora², G. Cardillo³, P.L. Filosso⁴, F. Carleo³, P. Novellis², F. Guerrera⁴, C. Rapicetta¹, M. Paci¹, G. Sgarbi¹

¹*Unit of Thoracic Surgery, IRCCS-Arcispedale Santa Maria Nuova, Reggio Emilia, Italy*

²*Thoracic Surgery, Catholic University of Sacred Heart, Rome, Italy*

³*Unit of Thoracic Surgery, San Camillo-Forlanini Hospital, Rome, Italy*

⁴*Thoracic Surgery, University of Torino, Italy, Torino, Italy*

Objectives:

Pulmonary carcinoids (PCs) causing Cushing's syndrome (CS) are very rarely reported. The aim of this study was to revisit the characteristics and outcomes of patients affected by PCs causing CS in a relative large multicentre study in order to identify the main prognostic factors.

Methods:

From 01/2003 to 01/2013, a total of 20 patients were treated in 4 Institutions. Clinical and pathological data were retrospectively reviewed. The Kaplan-Meier method, Breslow and log-rank tests were used for the statistical analysis when indicated.

Results:

Mean age and male/female ratio were 51±13 years and 14/6, respectively. The main clinical, surgical and pathological features of the population are summarized in Table 1. All patients but 2 (treated with chemotherapy) underwent surgical resection with curative intent. At diagnosis, 8 patients (40%) presented with advanced (or locally advanced) disease. The overall median and 5-year survivals were 47 months and 71.5%, respectively. A complete remission of CS was obtained in 14 cases (70%). Four patients (25%) experienced a relapse of disease after radical surgery. Log-rank analysis identified the tumor location (peripheral vs central; $p=.004$), the histology (atypical vs typical carcinoids; $p=.064$), the pTNM-staging ($p=.020$), the number of mitosis ($p=.001$), the ki-67% index ($p=.001$) and the persistence of CS ($p=.035$) as prognostic factors in such cohort of patients.

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

Features	Total sample= 20
Age (Mean±SD)	51±13 years
Gender	
Male/ Female	14 (70%) / 6 (30%)
Symptoms at diagnosis	16 (80%)
Lab Tests	
ACTH serum values (Mean±SD)	83.0±28.5 pmol/mL
Cortisol serum values (at 8:00 a.m.) (Mean±SD)	36.8±7.8 µg/dL
Urinary Cortisol values	44.2±13.6 µmol/dL
Tumor Location	
Peripheral	13 (65%)
Central	7 (35%)
Tumor-size (Mean±SD)	2.1±1.2 cm
Histological cell type	
Typical Carcinoid	15 (65%)
Atypical Carcinoid	5 (35%)
Surgery	18 (90%)
Lobectomies/bilobectomies	15 (83.3%)
Pneumonectomies	1 (5.5%)
Wedge Resection	2 (11.1%)
Completeness of resection	
R0	16 (88.9%)
R1	1 (5.5%)
R2	1 (5.5%)
Pathological Staging	
I	9 (45.0%)
II	3 (15.0%)
III	5 (25.0%)
IV	3 (15.0%)
Lymph Nodal Involvement	
N0	11 (55.0%)
N1	3 (15.0%)
N2	6 (30.0%)
Pathological features	
Number of Mitosis (Mean±SD)	3.2±3.1
Necrosis	3 (15.0%)
Vascular Invasion	4 (20.0%)
Ki-67% index (Mean±SD)	5.3±5.7
Cushing's Syndrome	
Persistence	5 (25.0%)
Remission	15 (75.0%)
Relapse of disease**	4 (25.0%)
Local	2 (12.5%)
Distant	1 (6.2%)
Both	1 (6.2%)

* Re-resected patients only

Conclusions:

Pulmonary carcinoids causing Cushing's Syndrome are characterized by a high rate of lymph nodal involvement at diagnosis (N2 disease in 30% of patients), a suboptimal prognosis (5-yr survival=71.5%) and a remarkable risk of relapse (~25%) even after radical resection. Tumor location (peripheral location), histology (atypical carcinoids), high number of mitosis, high ki-67% index, advanced p-Stage and the persisting of the CS after surgery correlate with a poor prognosis in such patients.

Disclosure: No significant relationships.



F-026

VALIDATION OF A NEW APPROACH FOR MORTALITY RISK ASSESMENT IN ESOPHAGECTOMY FOR CANCER BASED ON AGE- AND GENDER-CORRECTED BODY MASS INDEX

Hans Van Veer¹, J. Moons¹, G. Darling², T. Lerut¹, W. Coosemans¹, T. Waddell²,
P. De Leyn¹, P. Naftaux¹

¹*Thoracic Surgery, University Hospitals Leuven, Leuven, Belgium*

²*Surgery, Division of Thoracic Surgery, University of Toronto, Toronto, Canada*

Objectives:

We developed a new algorithm to identify high-risk patients for underweight after esophagectomy for cancer. Patients are assigned to an age-gender-specific BMI-percentile (AG-BMI) which is then used in a survival analysis. This model is able to identify more patients at risk for underweight in comparison to the classically used BMI. It shows a worse overall survival (OS) in patients with a preoperative AG-BMI<10th-percentile. The aim of this study is to validate this new model based on a cohort of patients from an external high-volume institution specialized in esophageal cancer surgery.

Methods:

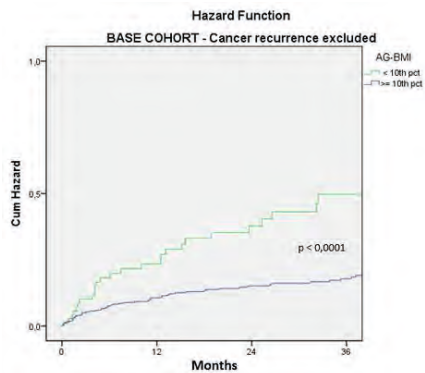
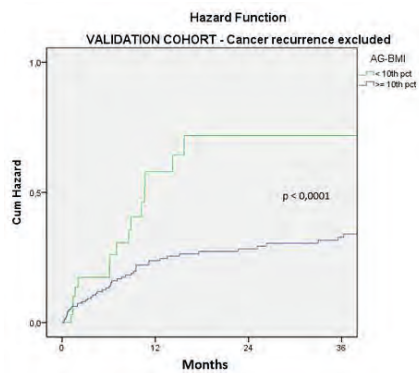
The validation cohort consists of 407 patients operated on between 1999 and 2012 with the prerequisite data to calculate AG-BMI and OS. The base cohort consisted of 642 consecutive patients, operated on in our institution between 2005 and 2010. Age, gender, height, weight on the day before surgery were used to calculate BMI and AG-BMI. OS was analysed and a multivariate analysis was performed.

Results:

Incidence rates of the AG-BMI<10th-percentile risk-patients in the validation cohort showed similar results to our original results (17.2% for both institutions) with a similar significant OS difference between at-risk-patients and not-at-risk-patients ($p < 0.001$). Multivariate analysis found the same five independent prognosticators for OS in both datasets: age, early versus advanced disease, resection status, number of positive lymph nodes and the AG-BMI-10th percentile, but not BMI itself. In the validation cohort, gender was identified as an additional independent prognosticator. The worse OS survival in AG-BMI<10th-percentile in both patient populations was related to a significantly higher number of deaths without esophageal cancer recurrence.

Conclusions:

This study validates the newly developed AG-BMI model to predict more accurately a subgroup of patients at risk for worse survival after esophagectomy. Improved perioperative identification of risk factors for poorer OS could help to develop perioperative strategies to reduce these risks.



Disclosure: No significant relationships.

F-027

EXPLORING STAGE I NON-SMALL CELL LUNG CANCER: DEVELOPMENT OF A PROGNOSTIC MODEL PREDICTING 5-YEAR SURVIVAL

Francesco Guertera¹, L. Errico³, A. Evangelista², G. Bora¹, E. Lisi³, S. Olivetti¹, E. Asteggiano³, P.L. Filosso¹, F. Ardissoni³, A. Oliaro¹

¹Thoracic Surgery, University of Torino, Italy, Torino, Italy

²Unit of Cancer Epidemiology and Cpo Piedmont, San Giovanni Battista Hospital, Torino, Italy

³Unit of Thoracic Surgery, University of Torino, San Luigi Gonzaga Hospital, Orbassano, Italy

Objectives:

In last years, impressive results in diagnosis and treatment of Non-Small Cell Lung Cancer (NSCLC) were accomplished. Despite of that, more than 30% of patients with Stage I NSCLC die at 5 years from surgical treatment. Defining prognostic factors to identify patients with a poor prognosis and develop tailored treatment strategies is then mandatory. Aim of our study is to design a model able to define prognosis in patients with Stage I NSCLC, submitted to surgery with curative intent.

Methods:

A retrospective analysis of two surgical registries was performed. Overall Survival (OS) was calculated starting from the date of surgery. Predictors of OS were investigated using the Cox model with shared frailty (accounting for the within-center correlation). Candidate predictors were: age, gender, smoke habit, morbidity, previous malignancy, ECOG PS, cN, SUVmax, FEV1, TLCO, vascular invasion, systematic lymphadenectomy, pT, histology, surgical resection type. In the final model were included predictors with $P \leq 0.15$, after a backward selection. Missing data in evaluated predictors were multiple-imputed and combined estimates were obtained from 5 imputed datasets.

Results:

Analyses were performed on 943 patients from two Institutions. Median follow-up was 48 months. Two-hundred twenty-one patients died, with a 5 years OS of 75%. Final Cox model (Table.1) demonstrated mortality was positively associated with male gender, vascular invasion, pT, cardiac comorbidities, systematic lymphadenectomy, TLCO and histology. The final model showed a fair discrimination ability with a C-statistic equal to 0.701: the calibration of the model indicated a good agreement between observed and predicted survival in poor prognosis patients (FIGURE.1).

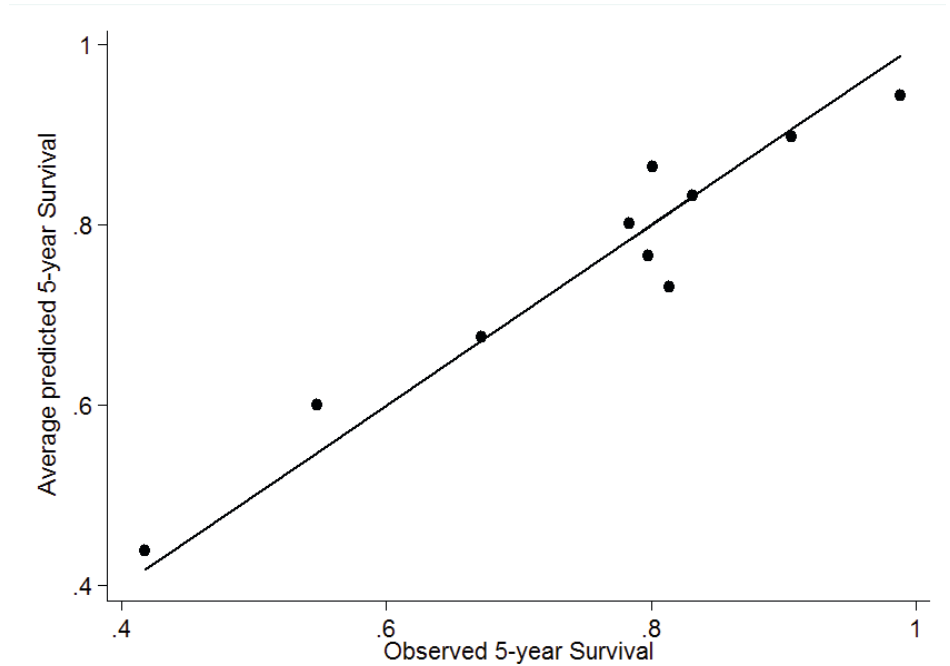


Table 1. Overall Survival predictors: estimates of final Cox model (with shared frailty)

	HR(95%CI)	P
Age (per 1 year increase)	1.01 (0.99 to 1.03)	0.37
Male gender	1.74 (1.22 to 2.49)	<0.01
Vascular invasion	1.44 (1.07 to 1.92)	0.02
Cardiac Comorbidity	1.31 (0.98 to 1.75)	0.07
Sistematic Lymphadenectomy	1.77 (1.28 to 2.46)	<0.01
pT		
T1a (ref)	1	
T1b	1.35 (0.88 to 2.07)	0.169
T2a	1.94 (1.37 to 2.75)	<0.01
FEV1		
FEV1 ≤ 1.6 L (ref)	1	
FEV1 > 1.6 L and ≤ 2 L	1.53 (0.91 to 2.56)	0.11
FEV1 > 2 L	1.1 (0.67 to 1.82)	0.71
TLCO*		
TLCO ≤ 0.6 (ref)	1	
TLCO > 0.6 and ≤ 0.8	0.72 (0.45 to 1.15)	0.16
TLCO > 0.8	0.63 (0.38 to 1.03)	0.07
Histology		
Adenocarcinoma (ref)	1	
Bronchioloalveolar carcinoma	1.01 (0.44 to 2.34)	0.98
Carcinoid	0.46 (0.2 to 1.08)	0.08
Large Cell Carcinoma	1.53 (0.79 to 2.97)	0.212
LCNC (Large Cell Neuroendocrine Carcinoma)	3.29 (1.4 to 7.7)	<0.01
Squamous-cell carcinoma	1.17 (0.85 to 1.59)	0.334

*Transfer factor of the lung for carbon monoxide

Conclusions:

We design an encouraging prognostic model based on clinical, pathological and surgical data, easy to draw out from routine practice. Further directions will be refining and validating our prognostic model, providing an easy to use prognostic tool for Stage I NSCLC patients.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014

15:30 - 17:30

SESSION V: PULMONARY NEOPLASTIC I

O-028

POST-OPERATIVE OLIGO-RECURRENCE OF NON-SMALL CELL LUNG CANCER: CLINICAL FEATURES AND SURVIVAL

Tomoyuki Hishida, J. Yoshida, K. Aokage, K. Nagai

Thoracic Surgery, National Cancer Center Hospital East, Chiba, Japan

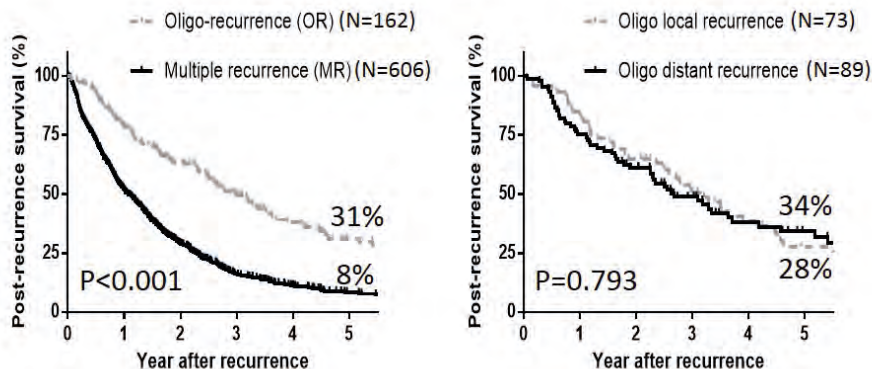
Objectives:

Post-operative recurrences of non-small cell lung cancer (NSCLC) are usually disseminated and incurable. Recently, the concept of oligo-recurrence (OR) which is theoretically treatable by local therapy has been proposed in several cancers. The aim of this study to clarify clinical features and outcomes of OR patients with resected NSCLC.

Methods:

Among 3275 patients with resected pathologic stage IA-IIIB NSCLC between 1993 and 2011, totally 768 patients developed recurrence and were included in this study. Oligo-recurrence (OR) was defined as locoregional or distant recurrence limited to one organ and fewer than 3 lesions per involved organ. Other recurrence was classified as multiple recurrence (MR). Second primary lung cancer and local recurrence arising in surgical margin were excluded.

Results:



OR and MR were identified in 162 (21%) and 606 (79%) patients. 129 (80%) of OR group had solitary recurrence. OR locations were regional lymph nodes in 43 (27%), brain in 40 (25%),

lung in 37 (23%), bone in 18 (11%), chest wall in 7, adrenal gland in 4, and others (skin/liver/kidney/stomach/intestine) in 13. Post-recurrence overall survival (PR-OS) was significantly better in OR than MR (5-year PR-OS: 31% vs 8%, $p<0.001$), and OR location did not affect PR-OS (5-year PR-OS: locoregional 28%, distant 34%, $p=0.793$). Treatment of OR included 84 (52%) definitive local therapy (DLT) such as surgery, radiosurgery, and definitive radiotherapy, 21 (13%) DLT plus chemotherapy, 10 (6%) chemotherapy, and 48 (29%) supportive care. 5-year progression-free survival after treatment including DLT were 18%. OR locations in 5-year progression-free survivors included lymph node, lung, brain, adrenal, and rib.

Conclusions:

The present study indicated oligo-recurrence (OR) in resected NSCLC was a distinct subgroup with long-term survival irrespective of recurrence location. A subset of “true” OR which was considered to be cured by DLT was also observed.

Disclosure: No significant relationships.



O-029

PATIENTS WITH MULTIFOCAL LUNG ADENOCARCINOMA WITH BAC FEATURES HAVE SIMILAR OUTCOMES AND SURVIVAL COMPARED WITH THOSE HAVING UNIFOCAI DISEASE

Massimo Castiglioni¹, C.L. Wilshire², E. Vallières², A.S. Farivar², R.W. Aye², J. Gorden², B.E. Louie²

¹Center for Thoracic Surgery, Department of Surgical and Morphological Sciences, University of Milan, Varese, Italy

²Thoracic Surgery, Swedish Cancer Institute and Medical Center, Seattle, United States of America

Objectives:

The term “BAC” includes newly defined adenocarcinoma-in-situ (AIS), minimally invasive adenocarcinoma (MIA) or lepidic predominant adenocarcinoma (LPA). It presents as one or multiple lesions. In the IASLC classification, AIS and MIA are more indolent with a highly favorable prognosis, but TNM upstages multifocality to a worse prognosis. The differences in outcomes in patients with multifocal (MF) compared to unifocal (UF) disease are unclear. We hypothesized that outcomes are similar regardless of presentation.

Methods:

A retrospective chart review of patients with lung adenocarcinoma with “BAC” features.

Results:

A total of 143 patients were identified: MF in 81(57%) and UF in 62(43%). In addition to the dominant lesion, the MF group included 187 nodules: 45 were resected concomitantly (23 in the same lobe and 22 in an ipsilateral lobe) while 142 were radiologically surveyed. Lobectomy was performed mainly in the UF group (66% vs 44%; $p<0.01$) while wedge resections in the MF group (41% vs 21%; $p<0.01$). LPA was the most prevalent pathologic subtype and primarily in the UF group (71% vs 52%, $p=0.01$). At 3.5 years of follow up, local (3 vs 1), regional (16 vs 15) and distant recurrences (4 vs 3) were detected in the MF and UF group ($p=0.67$). No new lesions occurred in the MF group; one in the UF. Only 1/142 surveyed preexisting lesion required further treatment. No significant differences were observed in disease free or overall survival at 5 years respectively (67.9% vs 68.5%, $p=0.38$ and 90.9% vs 87.6%, $p=0.47$).

Conclusions:

After resection of the dominant adenocarcinoma, patients with multifocal lesions behaved similarly to patients with unifocal disease. Recurrent disease, the development of new pulmonary lesions and survival were similar. This suggests that patients with multifocal disease should not be upstaged and should be treated with the same curative intent as those with unifocal disease.

Disclosure: No significant relationships.

O-030

THE BURDEN OF DEATH FOLLOWING DISCHARGE AFTER LOBECTOMY

L. Schneider, F. Farrokhyar, A. Bassili, Y. Shargall, C. Schieman, W.C. Hanna,

Christian John Finley

Surgery, McMaster University, Hamilton, Canada

Objectives:

Pulmonary lobectomy is the most commonly performed surgery for lung cancer and remains the gold standard operative treatment. The reported surgical mortality from this procedure rarely differentiates between in-hospital mortality (IHM) and early post-discharge mortality (PDM). Within this study, we aim to examine the IHM and 90-day PDM over time and identify outcome predictors including patient characteristics, co-morbidity, and system level factors.

Methods:

Data from 2005-2011 was acquired from a linked Ontario population-based database and we reported proportional mortality and cumulative survival attributable to IHM and PDM. Multi-variate logistic and Cox regression analyses were performed to examine the role of variables associated with mortality.

Results:

Of 5389 patients who underwent lobectomy for Non-Small Cell Lung Cancer, median length of stay was 6 (1-30) days. IHM was 1.4% (n=73) and PDM was an additional 1.9% (n=101) within 90 days post-lobectomy discharge. Logistic regression suggests age [Odds ratio(OR): 1.5 (1.3-1.8)], MI [OR: 3.6 (1.8-7.0)], CHF [OR: 5.8 (2.4- 13.8)], COPD [OR: 1.9 (1.1-3.2)], pre-operative PET [OR: 2.7 (1.1-7.0)], peptic ulcer disease [OR: 22.1 (4.1-117.4)], hemiplegia [OR: 15.8 (1.8-141.1)], primary lung cancer [OR: 0.5 (0.3-0.8)] and year of surgery [OR: 1.0 (0.8-1.0)] were predictive of IHM. Length of hospital stay [Hazard ratio(HR): 1.1 (1.0-1.1)], male gender [HR: 1.5 (1.0-2.3)], age [HR: 1.1 (1.0-1.3)], metastatic cancer [HR: 2.6 (1.7-4.0)] were predictive of PDM. All other factors were not significant.

Conclusions:

PDM represents a substantive and under-reported burden of operative mortality. More than half of post-lobectomy mortality occurs post-discharge and the rate remained unchanged over the study while IHM fell with time, suggesting that the improvement seen in mortality is exclusive to the smaller IHM. Patient factors play a significant role in both IHM and PDM, which identifies the importance of appropriate patient selection and a need for continued investigation of risk factors of this significant mortality.

Disclosure: No significant relationships.

O-031

ADJUVANT CHEMOTHERAPY IN PATIENTS UNDERGOING COMPLETE RESECTION FOR LOCALLY ADVANCED NON-SMALL CELL LUNG CANCER: EFFECT OF IN VITRO CHEMOSENSITIVITY TESTING RESULTS ON PROGNOSIS

Masahiko Higashiyama¹, J. Okami¹, T. Tokunaga¹, T. Kanou¹, Y. Akazawa², F. Imamura²

¹Thoracic Surgery, Osaka Medical Center for Cancer and Cardiovascular Diseases, Osaka, Japan

²Respiratory Medicine, Osaka Medical Center for Cancer and Cardiovascular Diseases, Osaka, Japan

Objectives:

The collagen gel droplet embedded culture drug test (CD-DST) is an in vitro anticancer drug sensitivity test. The CD-DST results of anticancer drugs have been obtained from the surgically resected non-small cell lung cancer (NSCLC) specimens (Lung Cancer 48:472, 2010). The aim of this study was to evaluate the effect of these results on prognosis in NSCLC patients receiving adjuvant chemotherapy.

Methods:

Of the patients undergoing complete resection for p-stage IIA through IIIA disease between 2008 and 2011, 49 patients (10 with p-stage II, and 39 with p-stage IIIA) were enrolled, who received adjuvant chemotherapy using platinum doublet regimen. The CD-DST results of anti-cancer drugs including cisplatin (CDDP), vinorelbine (VNR) and five others were successfully obtained from these patients. According to the CD-DST results, the patients were divided into a sensitive regimen group (Group S) and a non-sensitive regimen group (Group N). The former received chemotherapy including at least one in vitro-sensitive drug, and the latter received chemotherapy including no in vitro-sensitive drug. Disease-free survival (DFS) was retrospectively analyzed.

Results:

The regimen consisted of CDDP+VNR in 37 patients and other combinations in 12. Twenty-nine and 20 patients were included in the Group S and the Group N, respectively. No differences of the backgrounds (p-stage, histology and regimen) were observed between these groups. The Group S showed a marginally better DFS than the Group N ($P=0.09$). Especially, the patients with p-stage IIIA in the former showed a more favorable DFS than those in the latter (median DFS; 27 months vs 13 months, $P<0.05$). According to multivariate analysis, CD-DST data was an important prognosticator influencing DFS.

Conclusions:

The CD-DST results showed an important effect on DFS in performing adjuvant chemotherapy for locally advanced NSCLC patients. This test is promisingly applied to develop an individualized adjuvant chemotherapy for such patients.

Disclosure: No significant relationships.

O-032

PREDICTORS AND REASONS FOR READMISSION AFTER PULMONARY RESECTION

Ravi Rajaram¹, M. Ju¹, C. Ko¹, K. Bilimoria¹, M. Decamp²

¹*Research and Optimal Patient Care, American College of Surgeons, Chicago, United States of America*

²*Surgery, Division of Thoracic Surgery, Feinberg School of Medicine, Northwestern University, Chicago, United States of America*

Objectives:

Readmission is increasingly used as a hospital quality indicator. Our objectives were to (1) report readmission rates after pulmonary resection, (2) identify potential risk factors for readmission, and (3) describe the causes of readmission in this patient population.

Methods:

Patients who underwent pulmonary resection were identified from the 2011 American College of Surgeons National Surgical Quality Improvement Program data. Four groups were examined: all resections, open lobectomy (OL), VATS lobectomy (VL), and pneumonectomy. Cox proportional-hazards models were developed to assess patient risk factors associated with 30-day unplanned readmission. The primary cause of readmission was identified by diagnosis codes.

Results:

Of 1,876 patients, there were 919 OL (49%), 726 VL (39%), and 88 pneumonectomies (5%). The 30-day readmission rate for all resections was 9.1%. The median time from discharge to readmission was 6 days (IQR 10 days). For OL, VL, and pneumonectomy, the readmission rates were 8.9%, 8.4%, and 11.4%, respectively. The readmission rate for patients without an inpatient complication was 6.2% whereas those with a complication were readmitted 22.1% of the time ($p < 0.001$). In patients without a complication, the only significant predictor of readmission was a history of COPD (HR, 2.48; 1.32-4.65) for OL and a history of neurologic disease (HR, 5.12; 1.83-14.35) for VL. In those with a complication, a history of recent chemotherapy or radiotherapy was a significant predictor of readmission after OL (HR, 6.40; 1.82-22.57) with no predictors identified for VL. For all resections, pulmonary (40%) and cardiac (9%) causes comprised the primary reasons for readmission. Pulmonary problems were also the primary reason for readmission after OL, VL, and pneumonectomy.

Table 1. Primary causes for unplanned readmission following pulmonary resection.

Procedure	Top 5 Reasons for Unplanned Readmissions (%)				
	1	2	3	4	5
All Pulmonary Resections (n=1,876)	Pulmonary (40.2%)	Cardiac (9.1%)	Gastrointestinal (6.1%)	VTE (5.5%)	Organ Space/Deep SSI (4.3%)
Open Lobectomy (n=919)	Pulmonary (35.0%)	Gastrointestinal (8.8%)	Cardiac (6.3%), VTE (6.3%), & Bleeding/Blood Loss (6.3%)		
VATS Lobectomy (n=726)	Pulmonary (42.4%)	Cardiac (17.0%)	Gastrointestinal (5.1%), CNS/Psych (5.1%), & Other Medical (5.1%)		
Pneumonectomy (n=88)	Pulmonary (44.4%)	Organ Space/Deep SSI (22.2%)	VTE (11.1%), Sepsis/Septic Shock (11.1%), & Other Infection (11.1%)		

Abbreviations: VTE, venous thromboembolism; SSI, surgical site infection; VATS, video-assisted thoroscopic surgery; CNS, central nervous system.

Conclusions:

While few preoperative factors predicted unplanned readmission, experiencing any postoperative complication more than tripled the rate of readmission. Perioperative attention towards reducing complications may be a viable strategy for decreasing readmissions after pulmonary resection.

Disclosure: No significant relationships.

O-033

PATIENTS WITH STAGE IIIA (N2) NSCLC SELECTED FOR NEOADJUVANT CHEMORADIATION AND SURGERY HAVE IMPROVED SURVIVAL COMPARED TO PATIENTS TREATED WITH DEFINITIVE CHEMORADIATION

Gail Darling¹, F. Li¹, D. Patsios², C. Massey³, A. Hope⁴, S. Keshavjee¹, T. Waddell¹, A. Bezjak⁴, F. Shepherd⁵, M. De Perrot¹, A. Pierre¹, K. Yasufuku¹, M. Cypel¹

¹*Surgery, Division of Thoracic Surgery, University of Toronto, Toronto, Canada*

²*Radiology, University of Toronto, Toronto, Canada*

³*Biostatistics, University Health Network, Toronto, Canada*

⁴*Radiation Oncology, Princess Margaret Cancer Centre, Toronto, Canada*

⁵*Medical Oncology, Princess Margaret Cancer Centre, Toronto, Canada*

Objectives:

The objective of this study was to compare survival in patients with stage IIIA (N2) NSCLC selected for treatment with definitive chemoradiation who may have been operative candidates or chemoradiation followed by surgery in a center with experience in surgery after chemoradiation.

Methods:

A retrospective analysis of patients with stage IIIA (N2) NSCLC treated with curative intent at a single center between 1997 and 2007. Survival outcomes were analyzed using Cox proportional hazards model, log-rank test and Kaplan-Meier methodology. Time to recurrence was compared using the proportional subdistribution hazards regression model, Gray's test and cumulative incidence functions. Survival outcomes and recurrences were compared in regression models adjusting for age at diagnosis, cell type, ECOG status, gender and smoking history. Regression models adjusted for a measure of the likelihood of having surgery (the Propensity score) were also determined.

Results:

Between 1997 and 2007, 199 patients with a median age of 61, were treated with chemoradiation followed by surgery (91) or chemoradiation (108). In the surgery group 71 (78%) had a lobectomy. Surgical patients were more likely to be younger ($p=0.045$), female ($p=0.045$), T1N2 (23% vs 19%) and less likely to be T3N2 (10% vs. 20%). Surgical patients had decreased disease recurrence at any location (HR= 0.49; 95%CI: 0.34-0.71, $p=0.0002$), locoregional recurrence (HR= 0.52; 95% CI: 0.2-0.84, $p=0.007$), and increased time to distant recurrence (HR= 0.65; 95% CI: 0.41-1.3, $p=0.07$) with a median survival of 3.4 yrs compared to 1.7 years for the nonsurgical patients (HR=0.53, 95% CI: 0.38-0.76, $p=0.0005$). The propensity score adjusted for overall survival was 0.56 (95% CI: 0.39-0.79, $p=0.001$). Mortality was 6 (6.8%) in the surgery group and 3 (3.2%) in the nonsurgery group.

Conclusions:

For carefully selected patients with stage IIIA(N2) NSCLC, neoadjuvant chemoradiation followed by surgery offers prolonged survival and time to recurrence.

Disclosure: No significant relationships.



O-034

B-TYPE NATRIURETIC PEPTIDE-GUIDED RISK ASSESSMENT FOR POSTOPERATIVE COMPLICATIONS IN LUNG CANCER SURGERY

Takashi Nojiri¹, M. Inoue¹, Y. Shintani¹, Y. Takeuchi², H. Maeda², M. Minami¹,
N. Sawabata¹, M. Okumura¹

¹General Thoracic Surgery, Osaka University Graduate School of Medicine, Suita, Japan

²General Thoracic Surgery, National Hospital Organization Toneyama Hospital, Toyonaka, Japan

Objectives:

It is important to detect high-risk patients efficiently for postoperative complications in lung cancer surgery. We previously reported that the patients with elevated preoperative B-type natriuretic peptide (BNP) levels ($>30\text{pg/ml}$) have an increased risk for postoperative atrial fibrillation, and cardiopulmonary complications in elderly patients (>75 years) following lung cancer surgery. The objective of this study was to evaluate clinical utility of BNP-guided risk classification for postoperative complications after lung cancer surgery.

Methods:

Six hundred seventy five consecutive patients who underwent a curative surgery for lung cancer in two specialized thoracic centers between 2007 and 2011 were included in this retrospective study. All patients were classified as preoperative BNP levels; normal group ($<30\text{pg/ml}$), mildly elevated group ($30\text{--}100\text{pg/ml}$), and severely elevated group ($>100\text{pg/ml}$). The primary endpoint was the incidence of postoperative complications, and results were compared between the three groups.

Results:

The incidence of postoperative complications was significantly higher in severely and mildly elevated groups than in the control group (Table; 85% and 47% vs. 11%, $P<0.0001$). Furthermore, in severely elevated group, there were more severe complications and high mortality rate. Table. Postoperative morbidity and mortality after lung cancer surgery classified as preoperative BNP level.

Variables	Normal (N=547)	Mildly elevated (N=114)	Severely elevated (N=13)	P value
All complications	62 (11%)	54 (47%)	11 (85%)	<0.0001*
Cardiovascular complications	47 (9%)	42 (37%)	7 (54%)	<0.0001*
Atrial fibrillation	43	32	4	
Arrhythmias (other than Af)	4	9	1	
Acute myocardial infarction	0	1	2	
Respiratory complications	13 (2%)	11 (10%)	6 (46%)	<0.001*
Pneumonia	12	8	4	
ARDS	1	3	2	
Acute renal failure	1	1	0	
Mortality	0 (0%)	0 (0%)	2 (15%)	

*Significant (p <0.05)

Conclusions:

Risk assessment using preoperative BNP levels was clinically useful for the selection of high-risk patients for postoperative complications.

Disclosure: No significant relationships.

O-035

PATIENT SATISFACTION WITH CARE IS NOT AFFECTED BY LONGER HOSPITAL STAY AND COMPLICATIONS AFTER LUNG RESECTION: A CASE MATCHED ANALYSIS

Cecilia Pompili¹, M. Tiberi², M. Salati³, M. Refai³, F. Xiumé³, A. Sabbatini³, A. Brunelli¹

¹Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom,

²Medical Oncology, Ospedali Riuniti Ancona, Ancona, Italy

³Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy

Objectives:

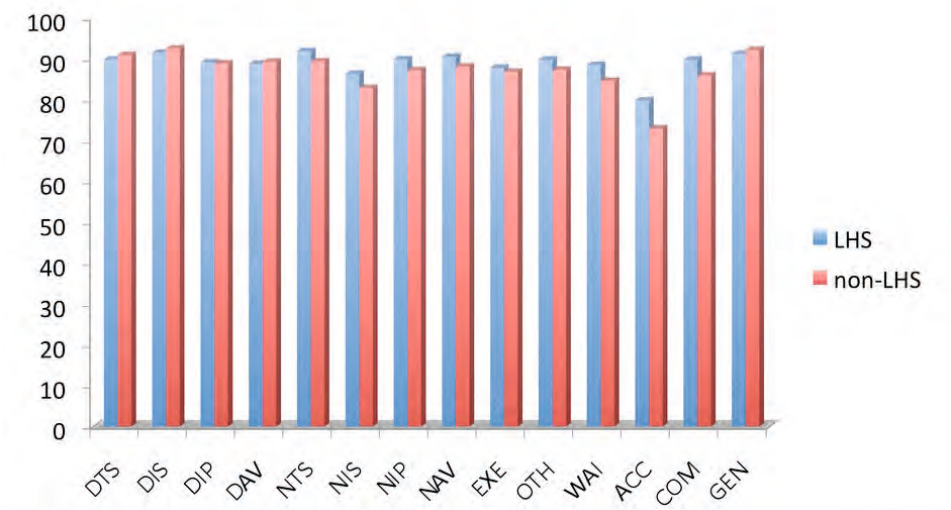
The objective of this investigation was to assess satisfaction with care of patients with long hospital stay (LHS) or complications after pulmonary resection in comparison with case-matched counterparts with a regular postoperative course

Methods:

Prospective observational analysis on 171 consecutive patients submitted to pulmonary resections (78 wedges, 8 segmentectomies, 83 lobectomies, 3 pneumonectomies) for benign (35), primary (93) or secondary malignant (43) diseases. A hospital stay > 7 days was defined as long (LHS). Major cardiopulmonary complications were defined according to the ESTS database. Patient satisfaction was assessed by the administration of the EORTC InPatSat32 module at discharge. The questionnaire is a 32-items self-administered survey including different scales reflecting the perceived level of satisfaction about the care provided by doctors, nurses and other personnel. To minimize selection bias, propensity score case-matching technique was applied to generate two sets of matched patients: patients with LHS with counterparts without it; patients with complications with counterparts without it.

Results:

Median length of postoperative stay was 4 days (range 2-43). Forty-one patients (24%) had a hospital stay > 7 days and 21 developed cardiopulmonary complications (12%). Propensity score yielded two well-matched groups of 41 patients with and without LHS. There were no significant differences in any patient satisfaction scale between the two groups (figure). The comparison of the results of the patient satisfaction questionnaire between the two matched groups of 21 patients with and without complications did not show significant differences in any scale.



All p-values > 0.05. DTS: Doctors technical skills; DIS: Doctors interpersonal skills; DIP: Doctors information provision; DAV: Doctors availability; NTS: Nurses technical skills; NIS: Nurses interpersonal skills; NIP: Nurses information provision; NAV: nurses availability; EXE: Exchange of information; OTH: Other hospital personnel kindness and helpfulness, and information giving; WAI: waiting time; ACC: Access; COM: comfort/cleanness; GEN: General satisfaction

Conclusions:

Patients experiencing poor outcomes such as long hospital stay or complications have similar perception of quality of care compared to those with regular outcomes. Patient Reported Outcome Measures are becoming increasingly important in the evaluation of the quality of care and may complement more traditional objective indicators such as morbidity or length of stay.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**16:00 - 17:30****SESSION VI: INNOVATIVE/EXPERIMENTAL****F-036****HIGH-QUALITY 3-DIMENSIONAL IMAGE SIMULATION FOR THORACOSCOPIC ANATOMICAL LUNG RESECTION: RESULTS OF PREOPERATIVE ASSESSMENT OF PULMONARY VESSELS AND SHORT-TERM SURGICAL OUTCOMES IN 125 CONSECUTIVE CASES**

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

Department of Surgery I, Tokyo Medical University, Tokyo, Japan

Objectives:

Anatomical variants of pulmonary vessels may carry serious risks such as unexpected bleeding in patients undergoing video-assisted thoracic surgery (VATS). The aim of this study is to evaluate the effectiveness of the three-dimensional computed tomography (3D-CT) software in short-term surgical outcomes and the preoperative assessment of variations of pulmonary vessel branching pattern in performing VATS.

Methods:

From May 2011 through January 2013, a total of 561 patients underwent pulmonary resection at our department. Among them, 180 consecutive patients who had undergone a VATS anatomical lung resection were included in the study; 125 patients in whom 3D-CT imaging was performed (3D-CT group), followed by segmentectomy (n=5) or lobectomy (n=120), and 55 patients without preoperative 3D imaging (Control group). Pulmonary vessel branching patterns observed intraoperatively were compared with the 3D images. Short-term outcomes, including postoperative complications, were retrieved from available clinical records. The occurrence of postoperative complications in this study was defined as grade 2 or more severe complication under the Common Terminology Criteria for Adverse Events (version 4.0) or the Clavien-Dindo classification system.

Results:

The frequency of patients with postoperative complications in the 3D-CT and control groups were 8% and 18%, and patients in the 3D-CT group showed significantly lower incidence of postoperative complications than those in the control group ($p < .05$). According to the intraoperative findings, 97.8% (309 of 316) of pulmonary artery (PA) branches were precisely identified on the 3D images. The sizes of the 7 undetected branches (right upper lobe 5, left upper lobe 2) ranged from 1-2 mm. The 3D images accurately revealed 15 cases (12%) of anomalous or unusual PA branches and 5 cases (4%) of variant pulmonary veins.

Conclusions:

High-quality 3D-CT clearly revealed the individual anatomies of pulmonary vessels and could play an important role in safe VATS anatomical resection.

Disclosure: No significant relationships.



F-037

**WATER SEAL'S ONE-WAY ACTION IN CHEST DRAINAGE SYSTEMS:
WHEN THE PARADIGM FAILS**Alberto Antonicelli¹, M. Nosotti², A. Guadagnini², M. Riva², F. Inzoli², F. Detterbeck¹¹*Thoracic Surgery, Yale School of Medicine, New Haven, United States of America*²*U.O. Thoracic Surgery and Lung Transplant, Fondazione Cà Granda, Ospedale Maggiore Policlinico, Milan, Italy***Objectives:**

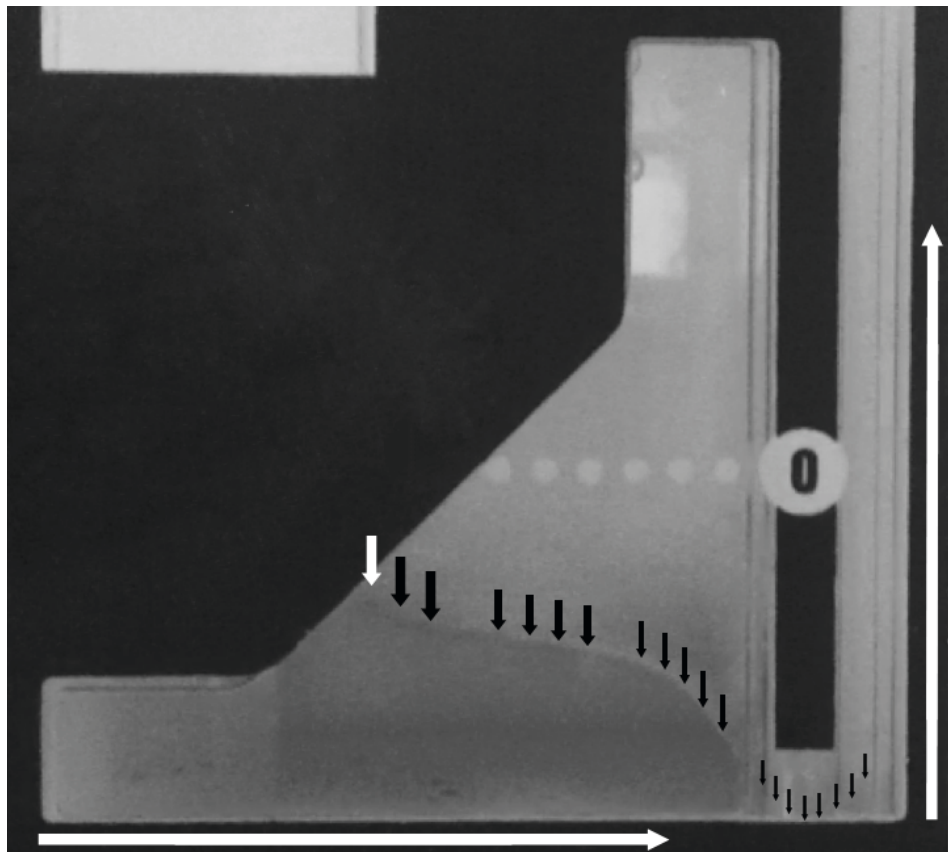
In most traditional chest drainage systems a water reservoir serves as a one-way valve for air. During deep inspiration some patients can entrain atmospheric air and mimic a “true” air leak during the following expiration. This gives the erroneous impression that the air is leaking from the lung. We investigated this phenomenon in the laboratory focusing on its clinically relevant features.

Methods:

The valves of 31 different drainage devices were tested simulating cyclic breathing patterns with controlled vacuum applied to the chest tube (0 to -160 cmH₂O). 3D modeling and computer simulations of the observed hydrodynamic process were used to correlate different structural characteristics of the valve chambers to the origin of the apparent air leak.

Results:

Twenty-six systems showed reverse airflow. The amount of negative pressure and time needed to produce this varied according to the valve geometry. Despite maintaining water in the reservoir, 15 systems demonstrated reverse airflow by bending of the water surface (Figure). Average applied suction was -74 cmH₂O (range -25 to -145) for an average of 2 seconds (1-7) and an average of 12 ml of air (3-19) was entrained per inspiration. Complete emptying of the reservoir occurred in all systems and average applied suction was -68 cmH₂O (-24 to -155) for an average of 65 seconds (4-244).

**Conclusions:**

Conditions for reverse airflow vary dramatically among systems. We identified 2 patterns. The first occurs at values easily attained by humans. Deep inspirations can create the impression of a prolonged air leak and thus likely prolonged hospital stay. The second occurs only in specific or unusual circumstances. Clinicians should acknowledge this phenomenon in order to avoid prolonged chest tube drainage. Translating these results back to the bedside and performing further research on different clinical scenarios will help improve patient care.

Disclosure: No significant relationships.

F-038

LUNG MESENCHYMAL STEM CELLS FUNCTION AS THE INDUCTIVE MICRO-ENVIRONMENT FOR HUMAN LUNG CANCER PROPAGATING CELLS

Luca Ampollini¹, G. Graiani², C. Frati², D. Madeddu², B. Lorusso², A. Falco², F. Sacconi², E. Quaini³, P. Carbognani¹, F. Quaini²

¹Department of Surgical Sciences, Thoracic Surgery, University Hospital of Parma, Parma, Italy

²Clinical and Experimental Medicine, University Hospital of Parma, Parma, Italy

³Cardiothoracic Department, Heart Hospital "G. Pasquinucci" Fondazione Toscana "G. Monasterio", Massa, Italy

Objectives:

The aim of the present study was to characterize the biological properties and in vivo tumorigenic potential of mesenchymal stem cells (MSC) obtained from human non-small-cell lung cancers (NSCLC).

Methods:

Specimens of NSCLC (33 adenocarcinomas, 12 squamous-cell carcinomas) surgically removed from 35 males and 20 females were processed to identify mesenchymal cells from human lung cancer (hLc-MSC). hLc-MSC were separated from neoplastic epithelial cells, frequently growing together with adherent stromal cells, expanded and extensively characterized. Subsequently, female BALB/c nude mice were subcutaneously injected with either 10⁶ Calu-3 (human adenocarcinoma cell-line able to reproducibly induce xenografted tumours) alone or in combination with 10⁶ hLc-MSCs. Control animals were injected with different doses of hLc-MSCs or Calu-3.

Results:

Primary cultures of hLc-MSC were obtained from all NSCLC samples. The typical MSC immunophenotype was documented by the expression of CD90, CD105, CD73, CD13, CD44 at FACS analysis. These cells were negative for epithelial antigens, CD45, CD14, CD34. CD117 (c-kit) and CD133 (prominin) were expressed in a limited fraction of cells. Interestingly, the nuclear transcription factors OCT 3/4 and SOX2 involved in stemness, TTF1 (bronchoalveolar), p63 (squamous lineage commitment) were expressed in hLc-MSC isolated from adenocarcinoma or squamous-cell carcinomas. In vivo experiments showed that the addition of hLc-MSC to Calu-3 injection was able to increase by 12-fold the dimension of subcutaneous tumours when compared to those induced by Calu-3 alone. Injected cells were detected on sections of xenografted tumours by fluorescence and FISH-analysis of human-specific-sex chromosomes combined with immunohistochemistry: Calu-3-derived cytokeratin-positive adenocarcinoma structures surrounded by hLc-MSC-derived cells were documented. Cytokines and growth-factors network implicated in the cross-talk between tumour cells and hLc-MSC is under intense scrutiny using a transwell system, specific conditioned media and co-cultures.

Conclusions:

Tumour propagating cells require the inductive interaction with mesenchymal stroma for the in vivo development of lung cancer.

Disclosure:

No significant relationships.



F-039

THE SIGNIFICANCE OF NECL-5 OVEREXPRESSION IN PATIENTS WITH LUNG ADENOCARCINOMA

Shinya Tane, H. Ogawa, D. Hokka, Y. Tanaka, S. Tauchi, Y. Maniwa

Division of Thoracic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

Objectives:

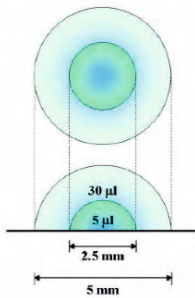
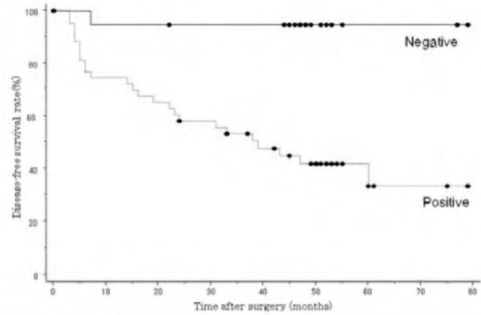
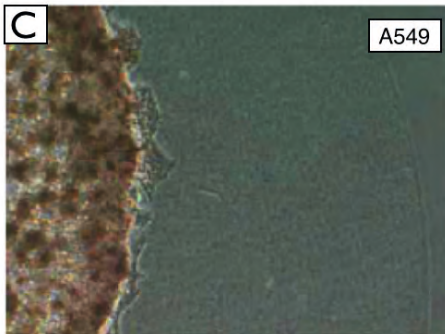
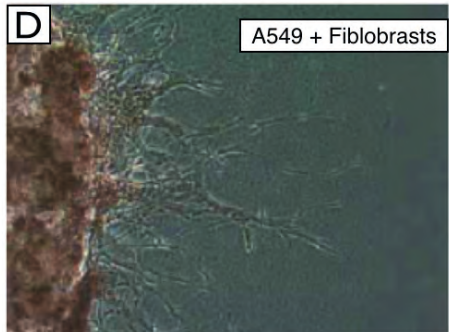
Neclin-like molecule-5 (Necl-5), which plays a role in cell–cell adhesion, cell migration, and proliferation, is often upregulated in cancer cells. The aim of this study was to examine the clinical significance of Necl-5 in lung adenocarcinoma, and to assess the role of Necl-5 in the development of cancer invasiveness.

Methods:

63 surgically resected lung adenocarcinoma tissues were investigated by immunohistochemistry for the expression of Necl-5, and the influence of its expression on clinical outcomes was assessed. To assess the role of Necl-5 in the invasive activity, we co-cultured A549 (bronchioloalveolar carcinoma cell line) and fibroblast by using a double-layered collagen gel hemisphere (DL-CGH) model that enables visualization of cell migration during invasion (Figure A), and knocked down its expression using RNA interference.

Results:

The disease-free survival rate in patients with positive Necl-5 overexpression (43 cases) was significantly lower than that with negative Necl-5 overexpression ($P = 0.0004$) (Figure B). Especially, the Necl-5 was strongly stained in the invasive sites of the tumors, where stromal and cancer cells were mixed. By western blotting, the expression of Necl-5 was higher in A549s than in fibroblasts. This tendency didn't change even when A549s were mixed with fibroblasts. DL-CGH model showed that A549s in the inner layer could not infiltrate into the outer layer by themselves, whereas A549s mixed with fibroblast widely spread into the outer layer (Figure C, D). Inhibition of Necl-5 in A549s resulted in suppressed invasive movement toward the outer layer. Additionally, Necl-5 knockdown inhibited the movement and proliferation of the A549s.

A**B****C****D****Conclusions:**

The overexpression of Necl-5 in cancer cells has clinical significance for prognostic evaluation of patients with lung adenocarcinoma, because Necl-5 expression is crucial for cancer invasiveness.

Disclosure: No significant relationships.



F-040

NANOTECHNOLOGY FOR IN VIVO ISOLATION OF CIRCULATING TUMOR CELLS (CTCS) IN NON-SMALL CELL LUNG CANCER PATIENTS

Wojciech Dyszkiewicz¹, L. Gasiorowski¹, K. Luecke², P. Zielinski¹

¹*Thoracic Surgery, Poznan University of Medical Sciences, Poznan, Poland*

²*Clinical Research, GILUPI, Potsdam, Germany*

Objectives:

Detection of tumor cells in the peripheral blood of lung cancer patients can be very helpful in establishing prognosis and personalized treatment options. Currently, tumor cells are isolated in vitro from small volumes of blood samples. To overcome this limitation, an innovative nanodetector, was used to isolate CTCs in vivo, directly from the bloodstream of patients.

Methods:

48 patients with operable NSCLC were enrolled in this study. The device was inserted into a cubital vein through a standard iv cannula for 30 minutes pre-operatively. The interaction of target CTCs with the device was mediated by an antibody directed against the epithelial cell adhesion molecule (EpCAM). CTC binding was confirmed by immunocytochemistry (ICC) with EpCAM and/or cytokeratines as positive markers, and CD45 for negative cell selection. Enumeration data were available for 34 NSCLC patients.

Results:

All the patients were operated on with curative intent. Pathological post-operative stage varied from IA through IIIB. Using the nanodetector, we successfully isolated EpCAM-positive tumor cells from the peripheral blood of NSCLC patients. The device sensitivity for in vivo CTC isolation was 94%. Surprisingly, the number of detected cells did not correlate with the lung cancer stage. There was no side effect of insertion of the medical device into the vein and it was tolerated well by the patients.

Conclusions:

High CTC detection rate obtained by nanodetector, if confirmed in further study, may improve early detection of lung cancer and therapy monitoring as well as become an independent prognostic factor. Tumor cells captured by the device can be subsequently analyzed by molecular techniques. This would open new possibilities of more personalized therapies.

Disclosure: K. Luecke: CEO of GILUPI GmbH

F-041

REAL-TIME DETECTION OF METASTASES IN LYMPH NODES DURING THORACIC SURGERY

Attila Enyedi¹, V. Csongor¹, K. Szabó¹, I. Takács¹, L. Sasi Szabó², T. Végh³, L. Tóth⁴, J. Balog⁵, Z. Takáts⁵

¹Thoracic Surgery, Medical and Health Science Centre, University of Debrecen, Debrecen, Hungary

²Pediatric Surgery, Medical and Health Science Centre, University of Debrecen, Debrecen, Hungary

³Department of Anesthesiology and Intensive Care, Medical and Health Science Centre, University of Debrecen, Debrecen, Hungary

⁴Pathology, Medical and Health Science Centre, University of Debrecen, Debrecen, Hungary

⁵Department of Surgery and Cancer, Faculty of Medicine, Imperial College London, London, United Kingdom

Objectives:

Detecting lymph nodes containing metastases during surgery could change both the surgical procedure and the outcome. Rapid Evaporative Ionization Mass Spectrometry (REIMS) is a recently developed technique for real-time, in-situ tissue identification. The objectives of this study were to test the “iKnife” method for the analysis of thoracic lymph nodes.

Methods:

REIMS is an emerging technique for characterization of human tissue by mass spectrometric analysis of the aerosol released during electrosurgical dissection. The first step in this study was the building of a tissue specific histologically validated database containing non-cancerous lymph node data and different type of lung cancers. The second step incorporated the analysis of these database spectra using multivariate statistical methods, and the saving of the calculated classification “model”. In the last step, the saved classification model was used for real-time classification of lymph nodes removed during surgery.

Results:

125 patients were recruited in the study. Cancerous tissue was collected from 97, healthy lymph node tissue was collected from 93 patients. The classification “model” consists of 239 healthy and 249 cancerous tissue, the cross-validation of this “model” resulted in 97.85% specificity and 96.95% sensitivity. The “model” was tested on an additional 6 patients containing metastases in at least one of the sampled lymph nodes. Our algorithm identified cancer metastasis in 17 cases, out of the 20 sampled cancerous lymph nodes, and marked 1 case as “outlier”. No cancer was identified in the sampled 6 healthy lymph nodes.

Conclusions:

The results presented here indicate that REIMS method is suitable for the detection of cancer metastases in lymph nodes based on a database built from healthy lymph node and cancerous

alveolar lung tissue spectra. The lymphoid gland identification with iKnife technique may significantly enhance real-time intraoperative decision-making and may result in increased patient survival rate.

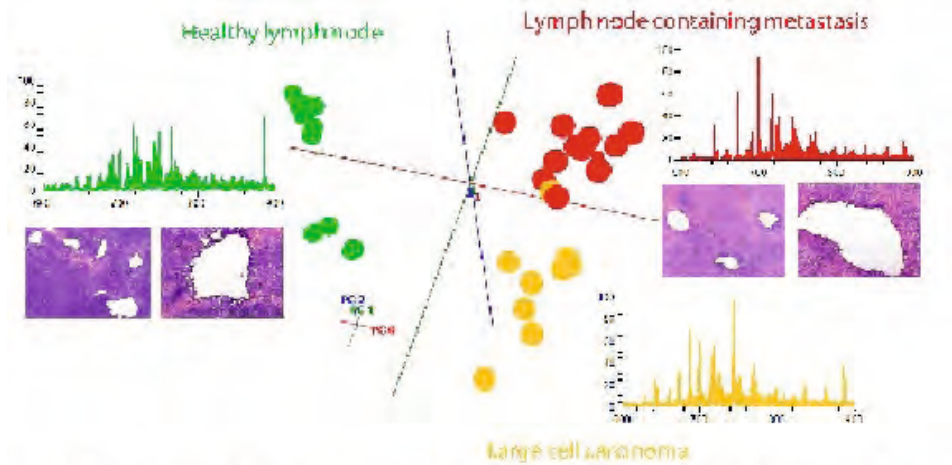


Figure 1. 3 dimensional Principal Component Analysis plot of data acquired from one patient. Both spectra and the plot demonstrate the similarity between primary lung cancer and the metastasis in one of the lymph nodes.

Disclosure: No significant relationships.

F-042

LUNG ULTRASOUND FOR THE EVALUATION OF EXTRAVASCULAR LUNG WATER AFTER THORACIC SURGERY

Lucio Cagini¹, C. Becattini², M.G. Ranalli³, A. Mancuso², M. Andolfi¹, G. Agnelli², F. Puma¹

¹Department of Surgery, Thoracic Surgery Unit, University of Perugia, Perugia, Italy

²Department of Internal Medicine, Internal and Cardiovascular Medicine, Stroke Unit, University of Perugia, Perugia, Italy

³Department of Political Science, Section of Statistics, Perugia, Italy

Objectives:

Following thoracic surgery extravascular lung water (EVLW) increases because of altered fluid dynamics and vascular permeability. This causes alveolar-interstitial syndrome (AIS) that impairs gas exchange resulting in severe cardiopulmonary complications. The ultrasonic diagnosis of AIS is made by the identification of B-Lines originating from water-thickened interlobular septa, and their absolute number is strictly correlated with the volume of EVLW. The aim of this prospective cohort study was to investigate the role of lung ultrasonography (LUS) to assess the variation in EVLW following major pulmonary resection.

Methods:

EVLW was assessed by a semi-quantitative method, at baseline and on postoperative days 1 and 4, through LUS using a 3,5 MHz convex probe, with patients undergoing lobectomy or pneumonectomy being examined in the sitting position. Four sub-regions were identified in the inviolate hemithorax and B-lines were quantified according to a four-level scale analyzed jointly using a proportional odds model for repeated measures with baseline values as covariates. In the same days we determined the respiratory ratio $\text{PaO}_2/\text{FiO}_2$ and estimated fluid retention by measuring brain natriuretic peptide (BNP).

Results:

48 men and 26 women underwent 64 lobectomies and 10 pneumonectomies; their mean age was 64.2. At baseline B-lines were absent in 63/74 of patients and the mean BNP value was normal. At the time of extubation a significant inverse correlation was found between B-lines value and the $\text{PaO}_2/\text{FiO}_2$ respiratory ratio (OR-0.72; 95% CI 0.55-0.92; $p=0.0096$). As compared to baseline there was a significant peak in the B-lines on postoperative day 1, as well as a significant positive association between B-lines and BNP (OR-1.00537; 95%CI 1.00295-1.00779; $p<0.0001$).

Conclusions:

Our results show that following major thoracic surgery LUS is able to estimate increases in EVLW. The number of B-lines is correlated to the BNP value and provides reliable information on the presence of AIS before it becomes clinically apparent.

Disclosure: No significant relationships.



F-043

A NOVEL CLINICALLY APPLICABLE FLUORESCENCE TECHNIQUE FOR IDENTIFICATION OF THE PULMONARY SEGMENTS USING THE PHOTODYNAMIC DIAGNOSIS ENDOSCOPE SYSTEM AND VITAMIN B2

I. Matsumoto, Ryuichi Waseda, M. Oda, G. Watanabe

General and Cardiothoracic Surgery, Kanazawa University, Kanazawa, Japan

Objectives:

The identification of the intersegmental plane is essential for a successful anatomic pulmonary segmentectomy. We evolved a novel fluorescence technique to identify pulmonary segments by using the photodynamic diagnosis endoscope system and vitamin B2. We reported the efficacy and safety of this technique in porcine lungs. In the present study, we applied this technique to examine the efficacy and safety in human anatomical pulmonary segmentectomy.

Methods:

A total of 8 patients with early-stage lung cancer were included in this study. The photodynamic diagnosis endoscope system consisted of the D-Light system as the excitation light source and a TRICAM camera as the fluorescence sensing endoscope (Karl Storz GmbH & Co, Tuttlingen, Germany). Vitamin B2 was used as the fluorescence substance. After identification of the target segmental bronchus, the fluorescent substance was injected. The fluorescent segments were identified using the photodynamic diagnosis endoscope system. The identified intersegmental planes were cut by electric cautery and staples, and segmentectomy were completed. The following operative outcomes were collected; success rate of identifying the pulmonary segments, time and blood loss in transection of the identified intersegmental planes. Perioperative complications were also recorded.

Results:

The following segmentectomy were performed; Right S1, S2, S3, S6, S7-10, Left S1+2, S6, S8, for each one case. In all procedures, it was possible to identify the target segment by its blight yellow–green fluorescence. The success rate of identifying pulmonary segments was 100%. The mean time of transection of the identified intersegmental planes was 26.2 ± 14.3 min, and the light intensity of fluorescence was enough during transection. The mean blood loss in transection was 35.7 ± 32.9 g, and no unexpected injuries of the major segmental bronchi and vessels occurred. No perioperative death and complications were encountered.

Conclusions:

This fluorescence technique involving the photodynamic diagnosis endoscope system and vitamin B2 allowed clinically the accurate and safe identification of the pulmonary segment.

Disclosure: No significant relationships.

F-044

COMPLETE THORACOSCOPIC LOBECTOMY FOR CANCER: COMPARATIVE STUDY OF 3DHD WITH 2DHD VIDEO SYSTEM

Patrick Bagan¹, F. De Dominicis², P. Berna², C. Pricopi³, J. Hernigou¹, F. Le Pimpec Barthes³

¹*Thoracic and Vascular Surgery, Victor Dupouy Hospital, Argenteuil, France*

²*Thoracic Surgery, Amiens University Hospital, Amiens, France*

³*Thoracic Surgery, Georges Pompidou European Hospital, Paris, France*

Objectives:

Common video systems for video assisted Thoracic surgery provide the surgeon a two-dimensional image (2D). This study aimed to evaluate performances of a new tri-dimensional High Definition (3D HD) system compared with two-dimensional High Definition system (2D HD) on surgical skills for Complete Thoracoscopic Lobectomy (CTL) performance

Methods:

This multi institutional comparative study used two video HD systems: 2D HD and 3D HD (Karl Storz Tuttlingen, Germany) for the same type of CTL. Criteria of inclusion: Stage I non small cell lung carcinoma proposed for a Left lower lobectomy and having given its agreement for the inclusion in the study. The CTL were performed by the same surgeon in 3D or 2D conditions. Lung cancer patients were randomized before incision in two groups: Group 2D and Group 3D regarding the video system. Statistical analyses were performed using the XLSTAT system (Addinsoft®, France). Student's t-test was used to test for differences between the two groups. We compared operating time (recorded on operating room software "Opera", CHC, Quebec), the drainage and hospitalization duration and the N upstaging rate on the definitive histology. A p value less than 0.05 was considered significant.

Results:

Between January and December 2013, 18 patients were included in the study. There were 14 male and 4 female with a median age of 68.6 years (49 - 81). In the group 3D, we observed a significant decrease of mean operating time and length of chest tube drainage. The length of hospital stay and the number of lymph node stations were similar in both groups (Table 1)

Conclusions:

The most interesting finding of this study was that 3D HD vision improved the lobectomy completion speed. The future integration of 3D systems should facilitate the expansion of thoracoscopic surgery to more complex resection and help to advance the field of endoscopically assisted surgery.

Table 1: Comparison of the results between the two groups based on the video system

Characteristics	Group 2D (n=9)	Group 3D (n=9)	p value
Age (mean)	64.1	70	-
Sex (M/F)	7/2	7/2	-
FEV1 (%) DLCO (%)	76 59	104 67	0.16 0.007
Operating room duration time (minutes)	176.5	145.8	0.000029
Drainage duration (days)	5.3	3.2	0.0043
Lymph node stations (n)	4.5	5.3	0.157
Number of upstaging (n)	N1 (1) N2 (1)	N1 (2) N2 (0)	NS

Continuous data are presented as the means

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**19:00 - 20:30****OSCAR NIGHT VIDEOS****V-045****POST-PNEUMONECTOMY EMPYEMA WITH BRONCHOPLEURAL FISTULA:
HOW TO AVOID CLAGETT WINDOW**Arthur Kostron, D. Schneiter, I. Opitz, W. Weder*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland***Objectives:**

To demonstrate the success of our accelerated post-pneumonectomy empyema treatment concept with this representative case

Video description:

A 65 year old male underwent extended right sided pneumonectomy for squamous cell carcinoma, stage IIIB after induction chemotherapy. Subsequently, he received adjuvant radiotherapy of the mediastinum. 2.5 years later he was referred to our hospital with severe left sided pneumonia requiring ICU admission. Late onset bronchopleural fistula and postpneumonectomy empyema were diagnosed. We decided to perform our accelerated empyema treatment concept with repetitive debridement leading to definitive closure of the chest cavity. Scheduled repetitive radical surgical debridement with placement of a vacuum system was performed three times. During the 4th intervention omentoplasty was performed to close the bronchial stump. Additionally a right sided latissimus dorsi flap was positioned to obliterate the chest cavity. Definitive closure of the chest cavity was achieved 12 days after the first intervention

Conclusions:

This video demonstrates the procedure of our successful accelerated treatment concept for postpneumonectomy empyema with bronchopleural fistula

Disclosure: No significant relationships.



V-046

SURGICAL SIMULATION GUIDED NAVIGATION: A NEW APPROACH IN THORACIC SURGERY

Nizar Asadi¹, G. Dolci¹, A. Dell'Amore¹, D. Greco¹, G. Caroli², C. Ammari², D. Giunta², A. Bini², F. Stella²

¹*Thoracic and Cardiovascular Surgery, General Thoracic Surgery, Bologna, Italy*

²*Thoracic Surgery Unit - University of Bologna, Policlinico S.Orsola-Malpighi, Bologna, Italy*

Objectives:

Not visible or palpable lesions of the chest wall remain a challenging situation for thoracic surgeon; therefor resection of large portion of the chest wall is often required to achieve free margin disease. Computer-based surgery and three-dimensional imaging technology associated to navigational systems are increasingly being used in surgery to experiment different surgical procedures

Video description:

We report three cases of non-palpable metastatic lesions of the chest wall that were surgical planned preoperatively and intraoperatively identified using the computer-based surgery. We used the sternal allograft transplantation to reconstruct the chest wall in tow patients that underwent partial sternectomy, and titanium bars in the third patient that underwent partial resection of the IV-V-VI ribs. In all patients the post-operative course was uneventful and on the follow-up after 12 months there were no complications and all patients were free of disease

Conclusions:

Three-dimensional surgical simulation guided navigation could be helpful procedure for planning of surgical resection and reconstruction of the chest wall; this technique is simple and easy to use and require a limited learning curve

Disclosure: No significant relationships.

V-047

TRACHEAL LEIOMYOMA

Lucia Hernandez Perez, J.C. Rumbero Sanchez, M. Fernando Garay, U. Jimenez Maestre, M. Lorenzo Martin, N. Uribe-Etxebarria Lugariza-Aresti, R. Rojo Marcos, J. Pac Ferrer
Thoracic Surgery, Cruces University Hospital, Barakaldo, Spain

Objectives:

Tracheal tumors are rare, contributing to less than 1% of all malignancies. There are few tracheal leiomyomas previously reported in the literature, as they represent 1% of all tracheal tumors. We present the case of a tracheal leiomyoma treated with surgical resection.

Video description:

A 69-year-old female was presented for surgical treatment. She reported a long-time history of asthma, progressively less well-controlled with broncodilators and steroids. CT scan showed a tracheal mass. Flexible bronchoscopy showed a well-vascularized polypoid mass at the distal third of the trachea that occluded over 50% of the tracheal lumen, and rigid-bronchoscopic biopsy was informed as leiomyoma. Right posterolateral thoracotomy through 4^o intercostal space was performed, with careful identification and dissection of tracheal carina, pulmonary artery, esophagus, distal trachea and both main bronchi. Membranous tracheal side was opened, and the tumor was identified and resected. The resection was macroscopically complete. Membranous side was then sutured with PDS 4/0, and reinforced with intercostal muscle. Postoperative period was uneventful, and the patient was discharged on the 8^o day. Pathology reported the resection of the tracheal leiomyoma was complete. Bronchoscopy performed 2 months later only showed a small granuloma. Patient's asthma is now under control without steroids.

Conclusions:

Limited resections, when complete, can be useful for resection of benign tracheal lesions

Disclosure: No significant relationships.



V-048

STERNAL RECONSTRUCTION

Fernando Cozar, P. Carmona, M. Congregado, M. Lopez-Porras, N. Pinos, J.C. Giron, R. Jimenez-Merchan, J. Loscertales

General Thoracic Surgery, Virgen Macarena University Hospital, Seville, Spain

Objectives:

Treatment of chest wall tumours lies in a radical exeresis and functional reconstruction. Chest wall defect leads to a loss of stability of the chest case, which must be fixed to avoid respiratory insufficiency

Video description:

This movie shows the case of a patient with sternal osteochondroma. Removal and reconstruction were performed in 2006. 5 years later the patient presented intensed chest wall pain produced by an osteosynthesis prothesis fracture. A new surgery was programmed to take out the broken material and a new sternal reconstruction with Stratos system and heterologus bone was done. The patient was extubated in the theater, and no postoperative complications were recorded. The patient was discharged at postoperative day 5, and she has had no long-term complications

Conclusions:

The reconstruction chest wall with diferents osteosynthesis material has helped to increase the surgical techniques in this kind of pathology and solve difficult cases

Disclosure: No significant relationships.

V-049

TRACHEALSLEEVELOBECTOMYFORMUCOEPIDERMOIDCARCINOMAOF THE CARINAGiuseppe Marulli, F. Rea*Department of Cardio-Thoracic and Vascular Sciences, University of Padua, Padua, Italy***Objectives:**

Tracheal sleeve lobectomy is a particularly challenging operation as it involves in addition to sleeve lobectomy with carinal resection and end-to-end anastomosis of the left main bronchus to the trachea, a creation of the secondary end-to-side anastomosis of the right lower bilobe either to the trachea or the left main bronchus. Right upper tracheal sleeve lobectomy is usually required for management of neoplasms involving the trachea or the carina at the level of the right main bronchus. Preoperative evaluation includes radiological and endoscopic assessment in order to accurately plan the type of resection and airway reconstruction. In this video we show the technique of tracheal sleeve lobectomy in a mucoepidermoid carcinoma of the carina involving the right main bronchus on the medial part until the origin of the bronchus intermedius.

Video description:

After performing a standard right upper lobectomy, the trachea is incised over the carina that is removed after the transection of the origin of the left main and intermedius bronchi. At that point the ventilation is carried out by intubation of the left main bronchus through the operative field. Release manoeuvres such as pericardial u-shaped opening and tracheal mobilization are performed before anastomosis. Thus, first an end-to-end anastomosis between the trachea and left main bronchus is carried out by using high frequency jet ventilation, then an end-to-side anastomosis between trachea and bronchus intermedius is performed after creation of a window on the trachea. The two anastomoses are covered with a pericardial flap and the anastomoses are checked with bronchoscopy.

Conclusions:

Tracheal sleeve lobectomy is a challenging operation that requires a meticulous technique and anaesthesiological management. Low-grade tumors involving the carina are the best indication for this kind of operation.

Disclosure: No significant relationships.



V-050

EXTENDED DOUBLE SLEEVE RIGHT UPPER LOBE CTOMY (SO CALLED TYPE A EXTENDED SLEEVE) COMBINED WITH TRANSPOSITION OF INFERIOR PULMONARY VEIN FOR LUNG CANCER

Kenji Suzuki, K. Takamochi, S. Oh, K. Imashimizu, T. Banno, T. Matsunaga, M. Fukui
General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

Bronchovascular sleeve is one of the established techniques to avoid pneumonectomy. Right upper extended sleeve, i.e. resection of upper, middle lobe and segment 6 of the lower lobe, may lead to kinking the inferior pulmonary vein resulting in impaired venous return postoperatively. We present a case of extended sleeve resection combined with transposition of the inferior pulmonary vein to prevent kinking of the inferior pulmonary vein.

Video description:

A 67 year old man, 175cm in height and 117kg in weight, with a past history of subarachnoid hemorrhage had squamous cell carcinoma of the lung in the right hilum. This lung cancer invaded interlobar pulmonary artery and bronchus, and was resectable by pneumonectomy. However patients could not tolerate pneumonectomy, and we decided to perform extended sleeve resection. Posterolateral incision was used for resection. Systematic lymph node dissection was performed at first to confirm resectability. Dissection of lower bronchus was performed and intersegmental plane between segment 6 and basal segment was dissected. The right main bronchus was cut and superior and middle pulmonary vein was also cut as well as vein of segment 6. To anastomose between right main bronchus and basal bronchus, tension between these bronchi is too tight and kink of the inferior pulmonary vein was confirmed intraoperatively. Thus we performed transposition of the inferior pulmonary vein to the orifice of the superior vein, followed by bronchoplasty and arterioplasty. Lung cancer was completely resected finally and operative time was 334 minutes with blood loss of 305cc. Technical pitfalls are discussed. Postoperative course was uneventful except pneumonia and patient was discharged 17th postoperative day.

Conclusions:

Transposition of the inferior pulmonary vein was effective for extended right upper, middle, and segment 6 double sleeve resection for lung cancer.

Disclosure: No significant relationships.

V-051

ESOPHAGEAL DIVERTICULECTOMY AND MYOTOMYM. Blair Marshall, N. Haddad*Thoracic Surgery, MedStar Georgetown University Hospital, Washington, United States of America***Objectives:**

The objectives of this video are to provide an anatomic correlation to the location of a large esophageal diverticulum and demonstrate the minimally invasive techniques for excision and myotomy

Video description:

This video demonstrates the anatomic challenges and technical aspects of a video assisted esophageal diverticulectomy and myotomy. The patient is a 42year old woman who was symptomatic from a large diverticulum. Manometry demonstrated a hypertensive esophagus with complete relaxation of the lower esophageal sphincter. Contrast CT demonstrated a large air and contrast filled diverticulum with passage of contrast into the stomach. The patient underwent a minimally invasive excision of the diverticulum with myotomy. We used 4 ports incorporating 3,5, and 10mm ports. The diverticulum is dissected with resection of the muscular fibers of the esophagus. Once the neck is identified, it is transected at the base with an endoscopic stapler. A myotomy is performed from the neck of the diverticulum distally to the level of normal esophageal muscle. Postoperatively, a barium esophagram demonstrated no leak and the diet was advanced and she was discharged that same day. She is well without symptoms 15 months postoperatively.

Conclusions:

The thoroscopic approach to esophageal diverticulectomy and myotomy and feasible and associated with early discharge and return to daily activitie

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014**08:30 - 10:00****SESSION VIII: MIXED THORACIC I****F-052****EVALUATION OF TUMOR IMAGING TECHNIQUES FOR MALIGNANT PLEURAL MESOTHELIOMA ORTHOTOPIC RAT MODEL**

M. Meerang¹, A. Boss², E. Felley-Bosco³, O. Lauk¹, S. Arni¹, B. Bitanihirwe¹, R. Stahel³, W. Weder¹, Isabelle Opitz¹

¹*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*

²*Department of Radiology, University Hospital Zurich, Zurich, Switzerland*

³*Laboratory of Molecular Oncology, University Hospital Zurich, Zurich, Switzerland*

Objectives:

An orthotopic rat tumor model for malignant pleural mesothelioma (MPM) provides clinical similarity to patients. The model is useful for several applications such as drug testing and surgical intervention. For non-invasive and repetitive visualization of tumor burden, a reliable imaging method is required. Here, we compared 2 techniques, namely bioluminescence (Bli) imaging and magnetic resonance (MR) imaging.

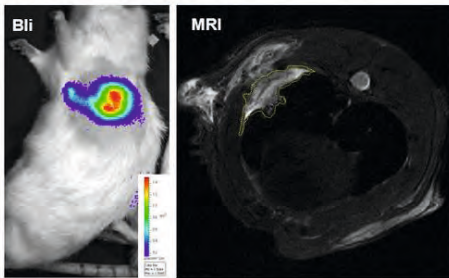
Methods:

Immune competent rats (n=5) were implanted subpleurally with 500,000 syngeneic rat MPM cells transfected with luciferase. At day 8 or 10 after the inoculation, MRI was performed using 4.7 Tesla small animal MR scanner equipped with a ¹H whole-body rat coil. Image data sets were acquired with T2-weighted fast spin-echo sequences in transverse orientation. Bli was measured by bioluminescent imager following intra-peritoneal injection of Bli substrate (D-Luciferin). Tumor burden was expressed either as volume (mm³) calculated from sequential MR images or as maximum Bli intensity (photon/second). Finally the tumor burden was correlated (Pearson correlation) with macroscopic tumor (ellipsoid) volume performed during autopsy at the same day

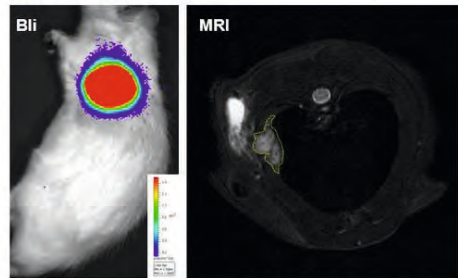
Results:

In all rats, a single tumor nodule was found at the inoculation site with a median volume of 52 mm³ (36 - 278). Tumor burden quantified from MR images correlated significantly with tumor volume measured (p<0.0001; r=0.99). However, signal intensity of Bli did not correspond with tumor volume measured neither by the macroscopic observation (p=0.50; r=-0.41) nor by MRI (p=0.50; r=-0.40; see figure).

Rat 1



Rat 2



The figure shows the discrepancies between tumor volume visualized by MRI and Bli signal. Rat2 shows strong Bli signal (red), however the tumor size seen by MRI is smaller than rat1 which exhibits lower Bli intensity

Conclusions:

Our results showed that MR imaging allowed more reliable assessment of MPM tumor burden in the present model. This non-invasive technique could also be performed repetitively. Bli has been shown to be a sensitive method; however reliable quantitation could be influenced by several factors such as the expression level of luciferase in cells or the absorption of D-luciferin.

Disclosure: No significant relationships.



F-053

CLINICAL APPLICATION OF WEB-BASED TECHNOLOGY FOR REMOTE SURGICAL FOLLOW-UP IN THORACIC SURGERY

Stephen D. Cassivi¹, S. Pruthi², D.A. O'Neil², R.L. Hamilton², B.R. Spurrier², G.D. Malagrino², D. Wood²

¹*General Thoracic Surgery, Mayo Clinic, Rochester, United States of America*

²*Center for Innovation, Mayo Clinic, Rochester, United States of America*

Objectives:

Formal follow-up is a cornerstone of what is considered complete surgical care. We sought to determine if a web-based technology could be developed that allows meaningful surgical follow-up to be accomplished with patients from their home at remote distances from our tertiary care specialty referral centre.

Methods:

A web-based video conferencing tool was developed for our institution with the specific function of facilitating video healthcare communication. It is secure and was created to be compliant with relevant healthcare regulatory bodies. In a prospective, non-randomized manner, we offered this video mode of follow-up to postoperative thoracic surgery patients as an alternative to the standardized on-site follow-up visit. Both types of follow-up were scheduled approximately six weeks following surgery. We performed a satisfaction survey of the participants after the follow-up visit.

Results:

We report on the first 20 consecutive patients participating in this trial. Median age was 64 years (range: 31-84 years). The male-female ratio was 13:7. Follow-up was for a variety of surgical procedures including: VATS and open lobectomy, VATS thymectomy, laparoscopic anti-reflux surgery, laparoscopic myotomy and chest wall resection. There were no issues uncovered that required return to our medical center. Two patients were able to be managed with minor wound-care issues with their local primary care physician. The average and median round-trip distance avoided by the patients were 2424km and 1043km respectively. Amongst the satisfaction survey data received, there was 100% overall satisfaction with the mode of video appointment. 95% felt that the cost/time commitment of their appointment was appropriate.

Conclusions:

Web-based technology can be applied to Thoracic Surgery follow-up. It provides a novel way of ensuring meaningful contact with patients who live at a distance from specialty care centres. This novel communication tool could be used to allow improved access to thoracic surgical specialty care to patients in seemingly remote areas.

Disclosure: No significant relationships.

F-054

RIGHT SLEEVE PNEUMONECTOMY AND RIGHT EXTENDED PNEUMONECTOMY: EARLY AND LONG TERM OUTCOMES COMPARISON

Marco Schiavon¹, G. Marulli¹, E. Verderi¹, N. Nannini¹, P. Feltracco², D. Gregori¹, C. Breda¹, F. Rea¹

¹*Department of Cardio-Thoracic and Vascular Sciences, University of Padua, Padua, Italy*

²*Anesthesia and Intensive Care, University of Padua, Padua, Italy*

Objectives:

Tracheal sleeve pneumonectomy (TSP) is the operation of choice for selected cases of NSCLC involving the right tracheobronchial angle or carina. This challenging operation is burdened by a high rate of perioperative morbidity and mortality, usually related to anastomotic complications. New techniques of right extended pneumonectomy (EP) (tracheal tangential suture and tracheoplasty) have been recently proposed as alternative to TSP for tumours involving the right tracheobronchial angle in order to avoid carinal resection. Our aim is to compare early and long term outcomes of EP vs TSP.

Methods:

We reviewed the clinical and pathological data of 42 right TSP compared to 17 right EP for NSCLC. The two groups were comparable for most of the pre-operative characteristics, except for sex (97.6% male in TSP and 76.5% in EP, $p=0.008$), number of comorbidities/patient (0.6 in TSP and 1.2 in EP, $p<0.001$) and induction therapy (33.3% in TSP and 82.4% in EP, $p<0.001$).

Results:

TSP was associated with a significant lower rate of intrapericardial approach (24%vs65%, $p=0.01$) and use of flap coverage (67%vs100%, $p=0.006$). No differences were observed concerning histology, pathological staging and adjuvant treatment. Analysing post-operative results, TSP had a significant longer hospital stay (median:13vs11 days, $p=0.05$) and need for bronchoscopic toilette (mean:1.6vs0.8, $p=0.006$). 30-days mortality was 5% in TSP and 0% in EP ($p=1$), also no difference was observed for 30-day morbidity (42.9%vs41.2%, $p=1$); a trend to a higher rate of tracheostomy (10%vs0%, $p=0.31$) and bronchopleural fistula (9.5%vs0%, $p=0.31$) was observed for TSP vs EP. TSP presented a significant higher rate of late (3 months after surgery) complications (21%vs0%, $p=0.038$). Local recurrence rate and disease free survival were comparable between groups.

Conclusions:

In high-experienced Centres, TSP and EP achieve satisfactory early and long-term results for locally-advanced NSCLC. EP avoiding a complete tracheal interruption may reduce airway and respiratory complications, post-operative care and shorten hospitalization.

Disclosure: No significant relationships.



F-055

BUILDING UP A VATS LUNG RESECTION PROGRAM. ELEMENTS TO IMPROVE FAST ADOPTION

Vasileios Tentzeris, E. Kefaloyannis, S. Begum, R. Hristova, R. Milton, N. Chaudhuri, A. Thorpe, K. Papagiannopoulos
Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

Objectives:

Despite established benefits, VATS lung resections continue to see a slow adoption in several countries. This study evaluated the development of VATS resection program in a leading UK thoracic centre and learning curves of first and second generation VATS lobectomy surgeons.

Methods:

We reviewed the electronic records of 1,809 consecutive anatomical lung resections carried out between 2006 and 2013. Of these 588 were carried out via a VATS approach. All of the patients were discussed preoperatively at a multidisciplinary team meeting with treatment consensus. The data was split individually among the consultants to assess surgical trend. All team members performed the operation but did not assist each other during their learning curve.

Results:

The VATS group included 556 lobectomies, 16 pneumonectomies and 16 anatomical segmentectomies. Individual surgeon's numbers ranged from 1 to 67 lobectomies per year (TABLE 1). Initially a keen minimally invasive surgeon carried out 75% of the overall VATS resections. In the past year the numbers equalised between 3 consultants with improvements in the other 2. The sharp engagement of the new member of the team, has improved the overall performance (FIGURE 1). The VATS procedure rate has increased from 17.67% in the 1st year to 64.07% after 6 years. In this series the overall conversion rate to open surgery was 9.71% and was affected by the seniority and experience in VATS (FIGURE 2).

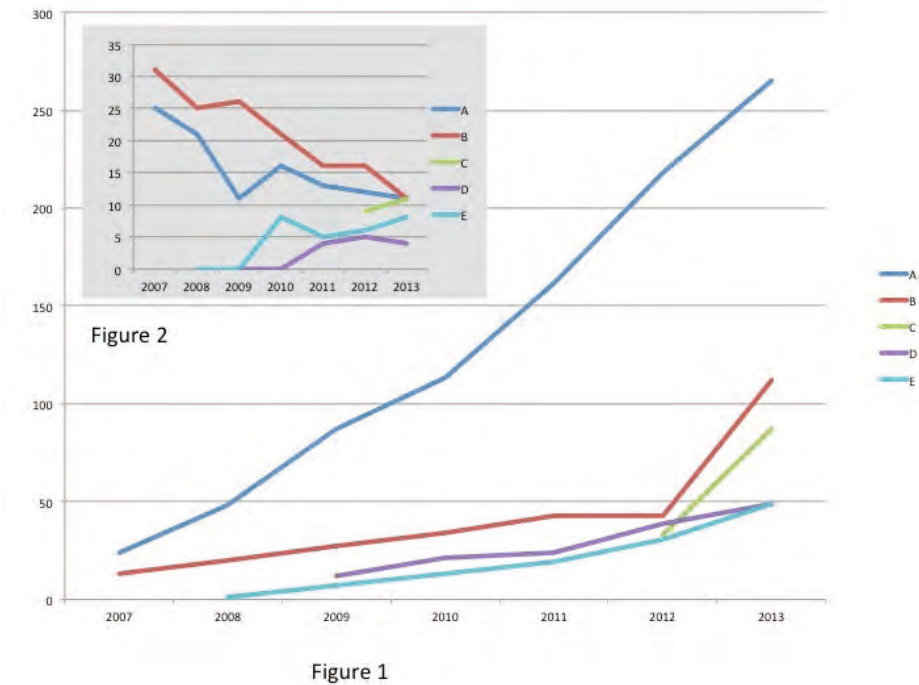


table 1								
Surgery/Year	1st	2nd	3rd	4th	5th	6th	7th	Total
VATS/Total Lung Resections	38/215 (17.67%)	34/201 (16.91%)	62/253 (24.5%)	48/225 (21.33%)	68/247 (27.5%)	140/359 (38.99%)	198/309 (64.07%)	588/1809 (32.5%)
VATS Lobectomies	36	33	61	46	64	126	190	556
Conversion to Open Surgery	10 (27.77%)	5 (15.15%)	7 (11.47%)	4 (8.69%)	3 (4.68%)	8 (6.34%)	17 (8.94%)	54 (9.71%)

Conclusions:
VATS is replacing traditional open surgery but continues to stumble upon hurdles such as individual surgeon culture and skills, cancer team perception, finances and time constraints with surgical capacity. This team is currently performing 64% of lobectomies via VATS approach, which is 6 fold higher than the national average. Junior members led by example, accomplishing a quick adoption. Success is steep when a team culture is present and standard operating procedures are agreed.

Disclosure: No significant relationships.

F-056

PROPOSAL FOR NEW CLINICAL T FACTOR OF THE NEXT EDITION OF TNM CLASSIFICATION IN NON-SMALL CELL LUNG CANCER USING THE CONSOLIDATION DIAMETER OR CONSOLIDATION TO TUMOR RATIO ON THIN-SECTION COMPUTED TOMOGRAPHY

Hirayama Shunki, K. Aokage, A. Nao, T. Hishida, J. Yoshida

Thoracic Surgery, National Cancer Center Hospital East, Chiba, Japan

Objectives:

The opportunity to encounter the lung tumor with ground glass component has been increasing with marked improvement of computed tomography (CT) technology in our daily clinics. The consolidation diameter or consolidation to tumor (C/T) ratio on Thin-section CT (TSCT) have been being widely recognized as the better prognostic indicators than tumor size in non-small cell lung cancer (NSCLC), but are not included in the seventh TNM classification. The aim of this study was to clarify which parameter reflects patients' prognosis more exactly and is more suitable as a new clinical T descriptor.

Methods:

We measured the consolidation diameter and C/T ratio in the lung field on TSCT for the 1074 resected NSCLC patients with cT1-3N0M0 between January 2002 and December 2008. We compared and analyzed the overall survival curves categorized at 10mm interval in consolidation diameter and those in patients with GGO-predominant (C/T ratio 0.5 or less) or consolidation-predominant (C/T ratio more than 0.5).

Results:

Median follow-up period was 5.5 year. Overall survival curves categorized in consolidation diameter were clearly separated. The 5-year survival rate in patients with GGO-predominant tumors of less than 20mm, 21 to 30mm and 31 to 50mm were 100%, 96% and 100%, respectively. The 5-year survival rate of less than 30mm, 31 to 50mm, 51 to 70mm and 71mm- in patients with consolidation-predominant tumors were 81%, 67%, 51% and 36%, respectively.

Conclusions:

The patients with GGO-predominant tumors revealed extremely good prognosis regardless of tumor size. Survival curves categorized by consolidation diameter and tumor size were clearly separated in appearance. But good prognostic population as the patients with GGO-predominant tumors were not extracted as an independent entity. We offer to include C/T ratio in a new clinical T description of NSCLC.

Disclosure: No significant relationships.

F-057

DOES THE USAGE OF A DIGITAL CHEST DRAINAGE SYSTEM REDUCE PLEURAL INFLAMMATION AND VOLUME OF PLEURAL EFFUSION AFTER MAJOR LUNG RESECTIONS FOR CANCER? A PROSPECTIVE, RANDOMIZED STUDY

Michele De Waele¹, C. Schieman¹, C.J. Finley², L. Schneider¹, T. Schnurr¹, F. Farrokhyar¹, W.C. Hanna¹, P. Nair³, Y. Shargall¹

¹*Thoracic Surgery, McMaster University, Hamilton, Canada*

²*Surgery, McMaster University, Hamilton, Canada*

³*Respirology, McMaster University, Hamilton, Canada*

Objectives:

Excessive amounts of pleural effusion are a common cause for delay in chest tube removal following lung resection. Digital pleural drainage systems are increasingly used, with assumed superiority over traditional analog systems in the management of post-operative air leak. The effect of system type on pleural effusion and inflammation has not been studied. We hypothesized that digital systems, introducing intermittent, balanced suction would be associated with less pleural inflammation and effusion formation.

Methods:

103 patients, enrolled in a prospective, randomized controlled study, received either analog (n=50) or digital (n=53) drainage systems following lung resection for malignancy. Chest tubes were removed according to an a priori defined protocol. Inflammatory mediators (Interleukin-6, 8, 10, 1Ra, TNF- α) in pleural fluid and sputum were collected and analysed. The primary outcome was to observe differences in pleural effusion volume. Secondary outcomes were duration of chest tube in-situ, air-leak incidence, length of hospital stay and degree of pleural inflammation.

Results:

Mean age was 66.7 years, 50.5% male. A trend for shorter chest tube duration was found with the digital system (p=0.055). There was no difference in total amount of fluid drained or length of hospital stay. Incidence of prolonged post-operative air leak was significantly higher when using the analog system (9 versus 2; p=0.025). Video-assisted procedures were superior to open on all outcomes (p<0.001). Lobectomy was associated with longer chest tube duration (p=0.001) and increased fluid drainage when compared to sublobar resection (p<0.001), regardless of drainage system. Comparison of inflammatory mediator levels revealed no difference.

Conclusions:

Digital drainage systems are superior in regards to incidence of post-operative air leak and chest tube duration. Inflammatory mediators and total pleural effusion volume are not correlated with type of drainage system utilized. Minimally invasive procedures and sublobar resections have less effusion formation and shorter duration of chest tube.

Disclosure: No significant relationships.

F-058

NEW VATS PLEURECTOMY TECHNIQUE FOR PATIENTS WITH RECURRENT SPONTANEOUS PNEUMOTHORAX

Kirill Gestkov, B. Barsky, O. Kuznetsova

Thoracic Surgery, Russian Medical Academy of Postgraduate Education, Moscow, Russian Federation

Objectives:

Pleurectomy with or without lung resection by video-assisted thoracic surgery (VATS) is the most popular approach for patients with recurrent spontaneous pneumothorax (RSP). One of the main complication following pleurectomy is the intrapleural bleeding. We propose the technique that allows to reduce intra- and postoperative bleeding following pleurectomy

Methods:

From February 2002 to December 2013, 725 patients with RSP were treated. Lung resection's were done in 695 (96%) cases. Male/female rate was 552/173 (76/24%) with average age 32,5 (20 - 46) years. In 409 cases patients (56,4%) had right-sided disease. According to the pleural cavity obliteration technique we divided patients in two groups: I – pleurectomy (proposed technique) (n=467) and II – electrocautery pleurodesis (n=258). Our technique: the 1st trocar we insert along the midaxillary line in the 4-5th intercostal space. Two additional trocars we insert along the anterior and posterior axillary lines in the 6th and 7th intercostal spaces. Pleurectomy technique includes - 1st step: sub-pleural infiltration using long needle and crystalloid solution. This manipulation allows to peel the pleura without blood loss. 2nd step: L-shape incision along the paravertebral line 1 cm above costo-vertebral joints and along the 8th intercostal space. The 3rd step: pleurectomy by twisting motion using rigid clamp

Results:

We found significantly difference between groups in intraoperative blood loss (60+20 ml in I group vs 5+15 ml in II group, $p<0,05$), and didn't found any difference in postoperative bleeding. Pleural drainages were removed in 2,8 (1,0; 11,0) and 6,2 (3,0; 18,0) days ($p<0,05$) and median hospital stay was 8+5,6 and 14+9,2 days ($p<0,05$) for the Ist and IInd groups respectively

Conclusions:

Proposed technique is easy to use, allows to perform pleurectomy without significantly blood loss and provide comparable results with traditional pleural cavity obliteration techniques

Disclosure: No significant relationships.

F-059

THE DIAGNOSTIC SIGNIFICANCE OF CIRCULATING TUMOR CELLS IN DIAGNOSING LUNG CANCER: CORRELATION WITH CLINICAL AND CYTO-MORPHOLOGICAL FEATURES

Alfonso Fiorelli¹, M. Scrima², E. Carelli³, D. Angioletti³, M. Accardo³, M. Di Domenico⁴, G. Viglietto², M. Santini¹

¹*Department of Cardio-thoracic Disease, Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

²*Department of Experimental and Clinical Medicine, Università Magna Graecia, Biogem scarl, Institute for Genetic Research "Gaetano Salvatore", Catanzaro, Italy*

³*Department of Pathology, Second University of Naples, Naples, Italy*

⁴*Department of General Pathology, Second University of Naples, Naples, Italy*

Objectives:

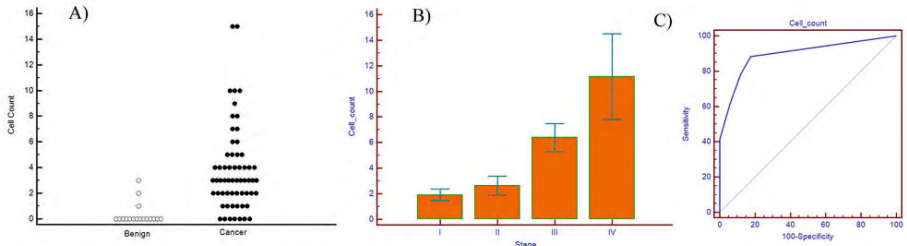
In lung cancer there still remains controversial on the incidence and diagnostic utility of circulating tumor cells (CTCs). We aimed to evaluate the performance of CTCs in differentiating benign from malignant lung lesion and to compare the cyto-morphological features of CTCs with cancer cells obtained from pre-operative biopsies and from surgical pathological specimens.

Methods:

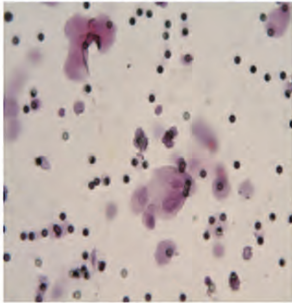
81 patients with radiological lung lesions were prospectively enrolled. Before diagnostic invasive exams, CTCs were captured from 7.5-mL peripheral blood samples with a ScreenCell system that used a filter of 7.5 μ m average pore size. The results, expressed as number of CTCs/7.5 ml, were correlated with definitive diagnosis and the cyto-morphological features of CTCs compared with results of preoperative biopsies and pathological specimens of resected patients.

Results:

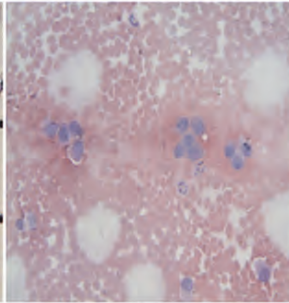
77 patients completed the study. 60/77 (78%) patients had primary lung cancer (30 Adenocarcinoma, 27 Squamous and 3 Large cell carcinoma). CTC count was higher in malignant than in benign lesions (3.8 ± 3.3 vs 0.3 ± 0.8 ; $p=0.0001$; t-test; Figure 1-A). ANOVA test (Figure 1-B) showed that Stage IV presented a higher CTC count than stage III ($p<0.05$), II ($p<0.05$) and I ($p<0.05$). ROC curve (AUC:0.896; 95%CI: 0,805 to 0,954; $p<0.0001$; Figure 1-C) showed that sensitivity, specificity, PPV and NPV to diagnose cancer were 78% (95%CI: 65.8 – 87.9); 88% (95%CI: 63.6-98.5); 95% (95%CI:86.0 – 99.5); and 53% (95%CI:33.5–72.8) in patients with ≥ 1 CTC count; a specificity of 100% (95%CI: 80.5-100%) was obtained with a CTC count ≥ 3 . In 42/60 (70%) malignant lesions the CTCs diagnosed the precise subtype of NSCLC i.e. adenocarcinoma, squamous carcinoma etc... When the CTCs were compared with biopsy or surgical specimen results, a correlation of 100% was found (Figure1-D).



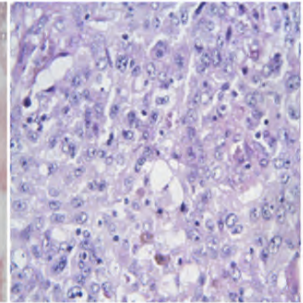
D) 59 year-old patient undergoing lobectomy for Adenocarcinoma



CTCs showed adenocarcinoma



FNAB showed adenocarcinoma



Pathological specimen of adenocarcinoma

Conclusions:

CTCs are promising biomarkers to diagnose lung cancer. If our data are corroborated by larger study, the “liquid biopsy” in the future would substitute the need for painful and often inaccessible “solid biopsies”.

Disclosure: No significant relationships.

F-060**LUNG VOLUME REDUCTION SURGERY IN LUNG TRANSPLANT CANDIDATES. IS IT WORTHWHILE?**

Sara Tenconi, I. Oey, U. Abdulmajid, S. Rathinam, D. Waller

Thoracic Surgery, Glenfield Hospital, University Hospitals of Leicester, Leicester, United Kingdom

Objectives:

As lung transplantation is not a realistic option for many of our COPD patients we have extended our selection criteria for lung volume reduction surgery. The iBODE index is a valid predictor of mortality in COPD. We wished to assess the risks and benefits of performing LVRS in high risk patients who were potential transplant candidates as defined by their iBODE index.

Methods:

Our study population included 156 patients (age 60[39-69] years, 88 male;68 female) with an iBODE index of 5 or more who underwent VATS LVRS. Patients with pulmonary hypertension (Mean PAP > 35 mmHg) or hypercapnia (pCO₂ >7KPa) were excluded from surgery. The iBODE index was calculated from preoperative FEV₁, body mass index (BMI), MRC dyspnoea score and shuttle walk test. In group A, 109 (70%) patients had an iBODE index of 5 or 6. In group B, 47(30%) patients had an iBODE of 7 or above. Postoperative clinical assessment at 3,6 and 12 months included record of FEV₁, BMI and reassessment of quality of life with the Euroqol questionnaire.

Results:

5 year survival was significantly higher in group A than group B : .There was a significant improvement in all outcomes in both groups. The magnitude of perioperative improvement was similar in both groups.

Conclusions:

The risk of LVRS increases with the severity of the underlying COPD. However, the survival in those with the highest iBODE index is similar to that reported for lung transplantation. Even in those with the highest risk there is significant physiological, nutritional and subjective benefits from LVRS.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014

11:00 - 12:30

SESSION IX: MIXED THORACIC II

F-061

A COMPARATIVE STUDY AMONG MINIATURIZED ULTRASOUND PROBES FOR PULMONARY NODULES DETECTION IN AN EX-VIVO LUNG PERFUSION (EVLP) MODEL

Niccolo Daddi¹, E. Sagrini², O. Perrone³, M. Lugaresi³, A. Ruffato³, A. Messi⁴, P. Candoli⁴, M. Ragusa¹, F. Puma¹, S. Mattioli³

¹*Surgical and Biomedical Sciences, S.C. Chirurgia Toracica, Perugia, Italy*

²*Department of Medical and Surgical Sciences (dimec), Division of Internal Medicine, Bologna, Italy*

³*Department of Medical and Surgical Sciences (dimec), Division of Thoracic Surgery, GVM Care and Research, Bologna, Italy*

⁴*Lugo Hospital, Pneumology and Respiratory Endoscopy Section, Lugo, Italy*

Objectives:

Intra operative localization of small pulmonary nodules with minimally invasive procedures is becoming very important in thoracic surgery. We compare performances of four ultrasound (US) probes, three currently used for thoracic endoscopic diagnostic procedures, in detecting lung nodules in an ex-vivo lung setting.

Methods:

Two porcine right and left lungs were en block procured with heart and trachea in a certified slaughterhouse, 10 minutes after the animal was suppressed. One block was preserved at 4°C for six hours (Control GROUP A). One block was perfused on site with Perfadex solution enriched with Tissue Plasminogen Activator, stored for six hours at 4°C and subsequently perfused with the Steen solution and ventilated according to the Ex-Vivo Lung Perfusion (EVLP) protocol (Group B). Four lungs were randomly seeded with four types of targets : waterball(WB); gel(GL); muscle(MS); fat(FT) [diameter, number of implants, depth in table]. Four US probes were tested in an open setting after lung collapse: Olympus radial UM-BS20R-3(20Mhz) [PROBE1], Olympus radial UM-2R(12Mhz)[PROBE2], Hitachi convex endobronchial ultrasound (EBUS) EB1970UK 2.0(5-10Mhz)[PROBE3], Hitachi convex EUP-OL531(5-10 Mhz) [PROBE4]. US probes were compared in terms of: a) number of nodules localized/not localized; b) US imaging quality based upon the nodule profile and its echogenicity graded according to semiquantitative scales from 0 (poor) to 4 (excellent). Student's t-test and analysis of variance with post hoc multiple comparisons were utilized with a statistical significance of $p < 0.05$.

Results:

See FIGURE. EVLP enhanced US localization of nodules in group B vs group A. Differences between US probes were detected for the number of localized nodules ($p=0.006$) and US diameter ($p=0.000$).

ON SPECIMEN		Mean Diameter (range)	Mean Depth (range)	ULTRASOUND	PROBE 1	PROBE 2	PROBE 3	PROBE 4	<i>p</i>	<i>p</i> GROUP A vs B
GROUP A	Type (Total Number)	15.3mm (11-20)	12.7mm (0-23)	Nodule Localized	8/11 4/5WB 0/1GL 2/3FT 2/2MS	6/11 3/5WB 0/1GL 1/3FT 2/2MS	9/11 4/5WB 1/1GL 2/3FT 2/2MS	8/11 4/5WB 0/1GL 2/3FT 2/2MS	0.134	0.360
	Water Ball (5)	16mm (16)	13.8 (0-25)	US Diameter (range)	13mm (10-15)	15.3mm (12-20)	15.5mm (12-19)	14.4mm (10-17)	0.079	0.565
	Gel (1)	11mm (11)	12mm (12)	US Depth (range)	11.2mm (10-15)	11.6mm (10-15)	14.7mm (10-18)	13.6mm (10-15)	0.485	0.679
	Fat (3)	16mm (13-20)	19mm (15-23)	US Nodule Margins 0 Not Detected, 1 Not defined, 2 Indistinct, 3 Regular, 4 Irregular	1.8 (0-4)	1.8 (0-4)	1.9 (0-4)	2.5 (0-4)	0.645	0.010
	Muscle (2)	15mm (15)	15.5mm (14-17)	US Imaging Score 0 Absent, 1 Poor, 2 Fair, 3 Good, 4 Excellent	1.6 (0-3)	1.7 (0-4)	2.2 (0-4)	1.5 (0-3)	0.584	0.021
GROUP B	Type (Total Number)	14.5mm (8-18)	14.7mm (7-22)	Nodule Localized	8/11 2/4WB 0/1GL 2/2FT 4/4MS	8/11 2/4WB 0/1GL 2/2FT 4/4MS	11/11 4/4WB 1/1GL 2/2FT 4/4MS	10/11 3/4WB 1/1GL 2/2FT 4/4MS	0.006	
	Water Ball (5)	16mm (16)	14.3mm (13-15)	US Diameter (range)	12mm (10-15)	15mm (15)	14.1mm (9-20)	14.3mm (11-20)	0.000	
	Gel (1)	16mm (16)	17mm (17)	US Depth (range)	11.8mm (10-15)	12.2mm (9-15)	13.8mm (8-19)	14mm (8-21)	0.587	
	Fat (3)	16mm (11-14)	14mm (12-16)	US Nodule Margins 0 Not Detected, 1 Not defined, 2 Indistinct, 3 Regular, 4 Irregular	2.6 (0-4)	2.8 (0-4)	3.1 (1-4)	2.7 (0-4)	0.809	
	Muscle (2)	14.2mm (8-18)	13mm (7-20)	US Imaging Score 0 Absent, 1 Poor, 2 Fair, 3 Good, 4 Excellent	2.1 (0-3)	2.1 (0-3)	2.5 (0-3)	2.6 (2-4)	0.624	

Conclusions:

EVLP enhanced US exploration of lung parenchyma in the ex vivo model. Linear probes performed better than radial ones; in the whole, EBUS scope (PROBE3) achieved the best performance and its use for retrieving pulmonary nodules could be studied in the clinical setting.

Disclosure: No significant relationships.

F-062

FUNCTIONAL ASSESSMENT OF VARIABLY DAMAGED LUNG GRAFTS IN A NOVEL RODENT MODEL OF EX VIVO LUNG PERFUSION (EVLV)

Y. Wang¹, X. Wang², Etienne Abdelnour², R. Parapanov², F. Gronchi³, J. Perentes², M. Gonzalez², H.B. Ris², L. Liaudet⁴, T. Krueger²

¹Division of Cardiovascular Surgery, West China Hospital, Chengdu, China

²Thoracic Surgery, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

³Anesthesiology, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

⁴Division of Intensive Care Unit, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

Objectives:

Therapeutic interventions during normothermic EVLP provide an opportunity to repair damaged donor lungs. Here we describe an experimental EVLP platform in rodents and assess its effect on variably damaged lungs.

Methods:

31 Sprague-Dawley rats assigned in five groups were tested on a customized EVLP circuit. In groups 1 and 2 cardiac arrest was followed by cold Perfadex[®] flush, lung heart bloc extraction and 3 hours cold preservation inflated with a FiO₂ of 0.21 and 0.5, respectively. Groups 3 and 4 were exposed to 1 hour warm ischemia time followed by 2 hours of cold preservation with a FiO₂ of 0.21 and 0.5. Group 5 had 2 hours of warm ischemia time followed by 1 hour of cold preservation with a FiO₂ of 0.21. Dynamic lung compliance (DC), pulmonary vascular resistance (PVR), differential oxygen partial pressures (Δ paO₂) and lung weight gain over 3 hours of EVLP were determined. Protein in bronchoalveolar lavage and protein carbonyl in lung tissue were quantified post EVLP.

Results:

DC increased in groups 1-2, remained stable in groups 3-4 and decreased significantly in group 5. PVR increased in all groups although no significant differences between groups were found. Δ paO₂ remained stable over time in groups 1 to 4 but decreased significantly in group 5. Lung weight remained stable in groups 1-2, increased non-significantly in groups 3-4 and increased significantly in group 5. BAL protein was low in groups 1-2, increased non-significantly in groups 3-4 and significantly in group 5. Protein carbonyl levels were high in all groups but no significant differences were found in between.

Conclusions:

Our novel rodent EVLP model allowed the assessment of quantitative parameters that reflected the degree of damage to the lung in accordance with the oxidative stress conditions applied. This model could be further exploited for the development of novel EVLP treatment strategies.

Disclosure: No significant relationships.

F-063

DOES IODINE PLEURAL SCARIFICATION PREVENT PROLONGED AIR LEAK AFTER PULMONARY LOBECTOMY? A PROSPECTIVE RANDOMIZED TRIAL

Aleksandar Yankulov¹, A. Chapkanov², A. Uchikov², B. Marinov³, S. Kostjanev³,
D. Petrov¹

¹Thoracic Surgery, SBALBB "St. Sofia", Sofia, Bulgaria

²Thoracic Surgery, UMBAL "St. George", Plovdiv, Bulgaria

³Pathophysiology, Medical University Plovdiv, Plovdiv, Bulgaria

Objectives:

A prospective randomized trial was conducted to study the preventive role of intraoperative iodine pleural scarification after lobectomy in high risk patients for prolonged air leak.

Methods:

A total of 60 high risk patients, well matched on their pre- and operative variables, were operated for lung carcinoma. The inclusion criteria for high risk patients were based on the scale proposed by Brunelli et al. (2010). The randomization was made at the operation end. Two groups, each 30 patients, were defined: group S with iodine scarification and group N without. The chest tube was connected to a digital system for air leak measurement with active suction -15cmH₂O. The air flow was monitored twice daily. The criteria for the chest tube removal were flow below 40 ml/min for 8 consecutive hours, fully inflated lung on chest X ray and chest tube effusion <200ml/24h. The prolonged air leak was defined as flow >40 ml/min through chest tube for more than 5 days. The duration of air flow more than 40 ml/min, chest tube duration and prolonged air leak incidence were compared in both groups. The Student's t-test for continuous and χ^2 test for categorical variables were used. A p value of <0.05 was considered to be statistically significant.

Results:

The group S had statistically shorter air flow duration (1.7 vs 2.6 days respectively, p=0.03) and lower incidence of prolonged air leak (1 vs 4 patients respectively, p=0.01). There was no significant difference in chest tube duration (3.5 vs 3.2 days respectively, p=0.12) in both groups. Localized pleural empyema was observed in one group N patient, successfully treated by VATS debridement.

Conclusions:

Pleural scarification is easy, safe and effective technique for prevention of postoperative prolonged air leak, decrease the duration of air flow through the chest tubes without impacting their removal time in high risk patients.

Disclosure: No significant relationships.



F-064

COMPARISON OF PULMONARY FUNCTION AFTER VATS LOBECTOMY AND LIMITED RESECTIONS FOR EARLY STAGE LUNG CANCER

Z. Gu, Wentao Fang, X. Guo, C. Ji, T. Mao

Thoracic Surgery, Shanghai Chest Hospital, Shanghai, China

Objectives:

Limited resections for early stage lung cancer have been of increasing interests recently. However, it is still not clear to what extent would limited resections preserve pulmonary function comparing to standard lobectomy, especially in the context of VATS.

Methods:

Spirometry test was repeated 6 months after 41 VATS lobectomy, and 29 VATS limited resections (21 segmentectomy and 8 wedge resection).

Results:

The 3 groups were comparable in demographic characteristics and preoperative spirometry data. On average, 3.6 segments were resected for lobectomy and 1.6 segments were removed for segmentectomy ($p < 0.01$). FVC loss was significantly greater after lobectomy (-0.55l) than segmentectomy (-0.41l, $p = 0.043$), and much significantly greater than after wedge resection (-0.13l, $p < 0.001$). FEV1 loss after lobectomy (-0.45l) was similar to segmentectomy (-0.4l, $p = 0.369$), both significantly greater than wedge resection (-0.2l, $p = 0.034$). DLCO loss was similar (-2.9ml/mmHg/min vs. -2.6ml/mmHg/min vs. -1.6ml/mmHg/min, $p = 0.328$ and 0.228). However, FEV1/FVC was actually improved after lobectomy but decreased after limited resection (+0.63% vs. -3.9%, $p = 0.014$). When compared by average value per segment resected, loss of pulmonary function was significantly less after lobectomy than after segmentectomy in all spirometry indexes (FVC: -0.15l vs. -0.3l, $p < 0.001$; FEV1: -0.12l vs. -0.29l, $p < 0.001$; FEV1/FVC: +0.22% vs. -0.26%, $p = 0.01$; DLCO: -0.8ml/mmHg/min vs. -1.68ml/mmHg/min, $p = 0.08$). On average, pulmonary function loss would be 5% per segment for VATS lobectomy and 10% per segment for VATS segmentectomy.

Conclusions:

In minimal invasive surgery for early stage lung cancer, segmentectomy may help minimize loss of FVC but not FEV1 or DLCO. Pulmonary function loss per segment was doubled after VATS segmentectomy than after VATS lobectomy. These results should be taken into account when considering limited resections for patients with decreased pulmonary function.

Disclosure: No significant relationships.

F-065

UNEXPECTED N2 DISEASE IN STAGE I NON-SMALL CELL LUNG CANCER: RISK FACTORS AND ANALYSIS OF SURVIVAL. A MULTI-INSTITUTIONAL STUDY.

Fiorelli¹, D. Sagan², S. Kaliniak², V. Liparulo³, E. Scarnecchia⁴, F. Caronia⁵, G. Vicidomini⁶, F. Puma⁴, M. Santini¹, Mark Ragusa³

¹*Department of Cardio-thoracic Disease, Thoracic Surgery Unit, Second University of Naples, Naples, Italy*

²*Department of Thoracic Surgery, Medical University of Lublin, Lublin, Poland*

³*Thoracic Surgery Unit, University of Perugia, Perugia, Italy*

⁴*Department of Surgery, Thoracic Surgery Unit, University of Perugia, Perugia, Italy*

⁵*Thoracic Surgery Unit, Mediterraneo Oncologic Center, Catania, Italy*

Objectives:

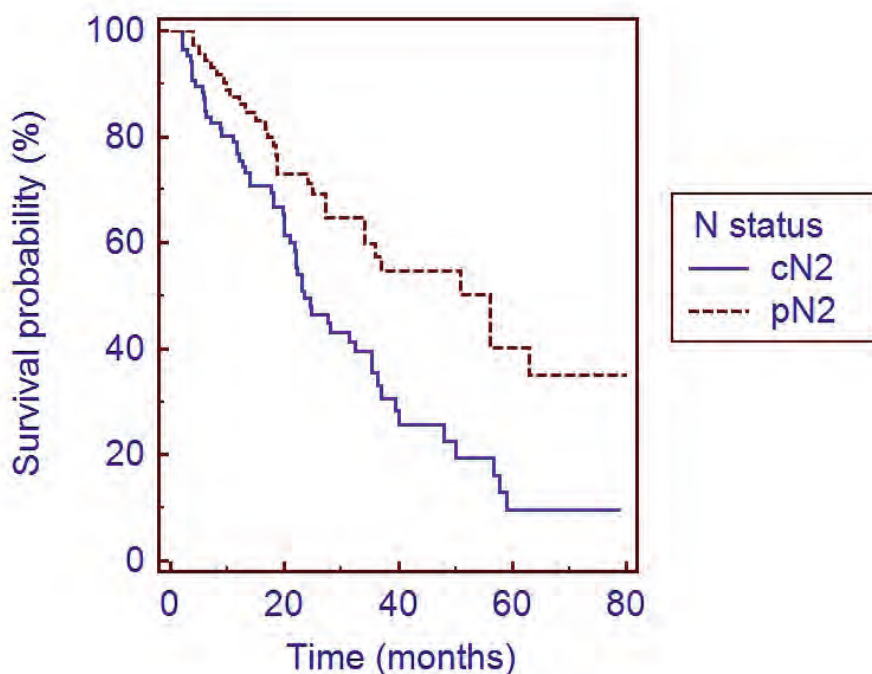
Controversies remain on the role of routine invasive mediastinal biopsy in stage I NSCLC studied by CT and PET scan, and if patients harboring unexpected N2 disease would have gained benefit from induction therapy. The present study evaluated incidence, risk factors and survival of NSCLC patients affected by unexpected pN2 disease.

Methods:

This is a retrospective multi-institutional study including consecutive NSCLC patients in stage I, submitted to curative resection with systematic lymphadenectomy, in the 2006-2013 period. Unexpected pN2-positive cases were compared with pN2-negative patients according to location, size, histology and SUV value of the primary tumor, using student's t-test and/or chi-square test. Furthermore, survival curves of unexpected pN2 patients were statistically compared using log-rank test with those of cN2 patients submitted to curative surgery after induction therapy, in the same period.

Results:

77/815 (9.4%) resected patients presented unexpected pN2 disease. Of these, 40 (52%) had also pN1 disease. Unexpected pN2 cases, compared with negative pN2 patients, showed: greater tumor size (37.8±11.8 mm vs. 23±37.3 mm, respectively: $p<0.0001$); higher SUV value (9.8±6.0 vs. 5±5.1, respectively: $p<0.0001$); higher incidence of central tumor (76.6% vs. 19.6%, respectively: $p>0.0001$). Adenocarcinoma was found in 37/77 (48%) of pN2 patients, without significant difference compared to control group. pN2 patients survival was significantly better than cN2 patients (56.0 vs. 23.4 months; Hazard Ratio 0.4; 95% CI: 0.32-0.76: $p=0.001$; Figure 1).



Conclusions:

Given the low incidence of unexpected pN2 cases and the better survival of such patients, in clinical stage I NSCLC routine mediastinal exploration for detecting occult N2 disease appears to not be indicated.

Disclosure: No significant relationships.

F-066

OUTCOMES FOLLOWING SUBLOBAR RESECTION, RADIOFREQUENCY ABLATION OR RADIOTHERAPY FOR STAGE I NON-SMALL CELL LUNG CANCER: A RETROSPECTIVE ANALYSIS

Seyer Safi¹, J. Op Den Winkel¹, G. Rauch², J. Kunz³, T. Schneider¹, C.P. Heussel³,
P. Huber⁴, H. Dienemann¹, H. Hoffmann¹

¹*General Thoracic Surgery, Thoraxklinik, Heidelberg University Hospital, Heidelberg, Germany*

²*Institute of Medical Biometry And Informatics, University of Heidelberg, Heidelberg, Germany*

³*Diagnostic and Interventional Radiology, Thoraxklinik, Heidelberg University Hospital, Heidelberg, Germany*

⁴*Radiation Oncology, Heidelberg University Hospital and German Cancer Research Center, Heidelberg, Germany*

Objectives:

Lobectomy is standard treatment for stage I non-small cell lung cancer (NSCLC). However, after tumor board review sublobar resection (SLR), radiofrequency ablation (RFA) or radiotherapy (RT) may be offered to high-risk patients who are unfit for standard resection or who refuse surgical treatment. This study examines recurrence and survival rates in stage I NSCLC after SLR, RFA, or RT.

Methods:

Patients with histologically proven clinical stage I NSCLC (cT1/2cN0) who were treated with SLR, RFA or RT were identified from a prospectively maintained institutional database and retrospectively analyzed. Clinical follow-up and CT scans were done at 3, 9, 15 and 21 months, and afterwards on an individual basis. Re-staging was done when clinically symptomatic. Primary end points were overall survival and progression-free survival. Kaplan-Meier analysis and log rank test were used.

Results:

Between January 2009 and December 2013 a total of 116 stage I NSCLC patients were treated with SLR (n=42; 27 men; median age: 68 years), RFA (n=25; 18 men; median age: 73,6 years) and RT (n=49; 34 men; median age: 73 years). Median follow-up for SLR, RFA and RT was 18, 13 and 10 months, respectively. Median time to local recurrence for SLR, RFA and RT was 16.5 months, 8 months and 7 months, respectively. Comparison of recurrence patterns showed better local control after SLR than after RFA or RT (p<0.05). Probability of 1- and 2-year overall survival was 94 % and 85 % for SLR versus 86 % and 74 % for RFA versus 93 % and 69 % for RT.

Conclusions:

Although overall survival was not different between the 3 modalities, local control rates in surgical cases were higher as compared to RFA or RT.

Disclosure: No significant relationships.



F-067

TREATMENT OF CHRONIC EMPYEMA USING A LAPAROSCOPICALLY PREPARED OMENTAL PEDICLED FLAP

Hironori Ishibashi, A. Ui, A. Asakawa, K. Seto, R. Wakejima, M. Kobayashi, K. Okubo
Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan

Objectives:

Thoracic surgeons find it is challenging to treat chronic empyema. Herein, we report our less invasive omental pedicled flap procedure for the management of chronic empyema.

Methods:

Intrathoracic debridement and filling with a laparoscopically prepared omental flap were performed in patients who had undergone open window thoracostomy for bronchopleural fistula or chronic empyema. The abdominal procedures were conducted through four 5-mm operating ports. Omental flaps were developed by separation from the transverse colon by division of some anastomosing arteries between gastroepiploic vessels and Barkow's arcade. Thoracic transposition of the omentum was achieved through a 3-cm diaphragmatic incision.

Results:

Between 2011 and 2013, four patients (all male; mean age, 66.8 years) underwent omentoplasty, of whom three had bronchopleural fistulas after lobectomy, and one had empyema due to methicillin-resistant *Staphylococcus aureus*. All the patients underwent open window thoracostomy and achieved closure of the thorax using laparoscopic omentoplasty after infection control. The mean operative time was 221 min (range, 170–300 min), and the mean blood loss was 30 mL (range, 10–100 mL). The postoperative course was uneventful. Oral intake resumed from day 2, and the chest drain was removed on day 2 in all of the patients. The mean postoperative hospital stay was 11 days (range, 9–14 days).

Conclusions:

Laparoscopic omentoplasty entails several advantages for the treatment of empyema. Minimally invasive techniques may widen the indications for the use of the omentum in the treatment of empyema.

Disclosure: No significant relationships.

F-068

FIRST EPISODE OF PRIMARY SPONTANEOUS PNEUMOTHORAX: IS A CT-BASED PULMONARY LESION SCORING SYSTEM VALUABLE TO SELECT PATIENTS FOR EARLY SURGERY?

F. Primavesi¹, T. Jäger¹, T. Meissnitzer², S. Buchner¹, S. Reich-Weinberger¹, D. Öfner¹, Jörg Hutter¹, M. Aspalter¹

¹Department of Surgery, Paracelsus Medical University, Salzburg, Austria

²Department of Radiology, Paracelsus Medical University, Salzburg, Austria

Objectives:

Though recurrence of primary spontaneous pneumothorax (PSP) is frequent, current guidelines do not routinely recommend surgery after the first presentation. A CT-based lung dystrophy severity score (DSS) has recently been proposed to predict recurrence rates following conservatively managed first episodes. The present study evaluates this score comparing surgically and conservatively treated patients.

Methods:

We performed a retrospective time to event analysis of all consecutive patients presenting with the first episode of PSP and compared video assisted thoracic surgery (VATS; group A) to conservative treatment with or without chest drainage (group B). Chest HR-CT scans were reviewed for presence of blebs or bullae and patients were assigned to DSS risk groups accordingly (low/ intermediate/ high grade). Primary end-point was development of ipsilateral or contralateral recurrence.

Results:

Between 01/2004 and 12/2012, a total of 56 patients were included (median age: 26 years [range 16-50]; male: 70%). Thirty-three patients received surgical therapy (group A; apical lung resection: n=30; partial pleurectomy: n=26; talc pleurodesis: n=5), while 23 patients were treated conservatively (group B; chest drainage: n=16). Median follow-up for patients without recurrence was 50.9 (group A) and 63.5 months (group B). Three-year overall recurrence free survival (RFS) was 87% for group A and 37% for group B ($p<0.0001$). Comparing these two groups stratified by DSS, three-year overall RFS was 93% vs. 55% for low-grade ($p<0.0001$), 79% vs. 16% for intermediate-grade ($p<0.0001$) and 88% vs. 25% for high-grade patients ($p<0.0001$).

Conclusions:

Our data suggests that risk-stratification of PSP patients by this CT-based scoring system represents a useful tool to indicate surgical therapy after the first episode. We advocate evaluation by CT for every PSP patient and early surgery at least for those with lesions exceeding one bleb (DSS > 3). Further evaluation of the DSS in a larger, prospective patient cohort is recommended.

Disclosure: No significant relationships.



F-069

DIGITAL PLEURAL DRAINAGE DEVICES ARE NOT NEEDED TO PREDICT THE OCCURRENCE OF PROLONGED AIR LEAK

Maria Rodríguez, M.F. Jiménez, M.T. Gómez-Hernández, N. Novoa, J.L. Aranda, G. Varela
Thoracic Surgery, Salamanca University Hospital, Salamanca, Spain

Objectives:

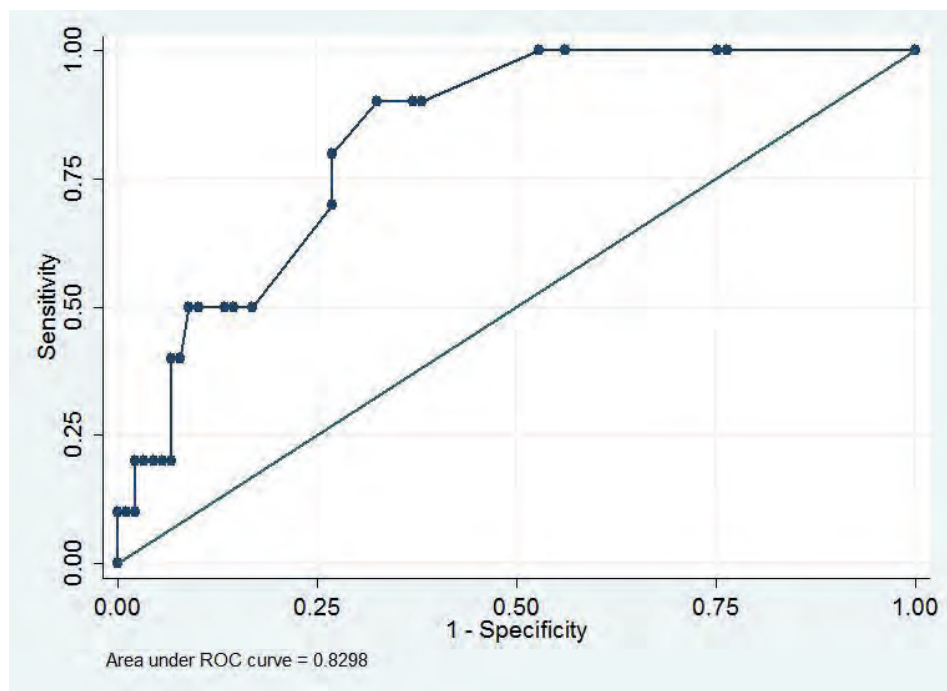
One of the reported advantages of digital pleural drainage devices is the possibility of predicting the occurrence of prolonged air leak (PAL) based on the recorded pleural pressures and/or air flow through chest tubes. Nevertheless, this fact has never been well supported. The objective of this investigation is to evaluate if the occurrence of PAL can accurately be predicted using clinical data and air leak measurements 24 hours after lung resection on conventional drainage systems.

Methods:

Prospective observational study on 100 consecutive non complicated patients who underwent anatomical lung resection (segmentectomy, lobectomy or bilobectomy). Prior to the operation, the risk of PAL was evaluated according to the score previously published (Ann Thorac Surg 2010;90:204). 24 hours after surgery, two independent observers measured air flow at forced deep expiration on a conventional drainage system with graduated analogical leak monitor. The agreement between both observers was calculated and in cases of discrepancy, the mean of both observations was calculated. After discharge, the occurrence of PAL (defined as persistent air leak 5 or more days after the operation) was recorded. A logistic regression model was constructed including two independent continuous variables (PAL score and air flow) and the performance of the model was assessed by non-parametric ROC curves.

Results:

The series includes 80 lobectomies, 8 bilobectomies and 11 anatomical segmentectomies. Median preoperative PAL score was 1 (range 0-3.5). Any postoperative air flow was observed in 30 cases with a median value of 1 (0.5-3.5). The prevalence of PAL in the series was 10% (10 out of 100 cases). Both independent variables entered in the model (PAL score $p=0.050$, air flow: 0.016) and C-index was 0.83 (Figure 1)

**Conclusions:**

The performance of this simple predictive model, without any electronic recording, is very good allowing early clinical decision making on patients with air leak after lung resection.

Disclosure: No significant relationships.

**TUESDAY, 17 JUNE 2014****11:00 - 12:30****SESSION X: PULMONARY NEOPLASTIC II****F-070****LESS IS MORE: THE DECREASING RATE OF THORACOTOMY AND PNEUMONECTOMY IN LUNG CANCER SURGERY WITHIN CANADA**S. Manohar¹, W.C. Hanna¹, Y. Shargall¹, C. Schieman¹, L. Schneider², Christian John Finley²¹*Thoracic Surgery, McMaster University, Hamilton, Canada*²*Surgery, McMaster University, Hamilton, Canada***Objectives:**

Over the last decade, lung cancer surgery has seen significant changes in technique and approach with increasing evidence supporting video assisted thoracic surgery (VATS) procedures and lung preservation. In our study, we sought to evaluate and quantify the types (pneumonec-tomy, lobectomy and sublobar resections) and approach (VATS and Open) utilized for lung cancer resections in Canada over time.

Methods:

From 2004 to 2011, all patients in Canada (excluding Quebec) undergoing pulmonary resec-tion for lung cancer were included. Data was obtained from the Canadian Institute for Health Information's Discharge Abstract Database. Patient factors, procedural case mix, and outcomes were evaluated. Descriptive statistics were performed to determine and evaluate the relative annual proportion of patients undergoing the differing types and approaches to lung cancer surgery as well as survival.

Results:

Of 25,555 cases analyzed, 48.4% were male, with an average age of 66.9 years. Over the study period, the proportion of patients undergoing pneumonectomy fell from 11.4% cases per year to 6.1%, as seen in Figure 1. The proportion of patients undergoing procedures with a VATS approach increased from 6.4% cases per year to 46.6%. Within groups, VATS sublobar resec-tions increased from 12.8% of cases per year in 2004 to 58% in 2011, while VATS lobectomy increased from 3.87% to 43.9%. Overall unadjusted mortality rates shifted from 2.60% in 2004 to 1.14% in 2011.

The proportion of patients undergoing VATS resection versus pneumonectomy for lung cancer in Canada from 2004 to 2011

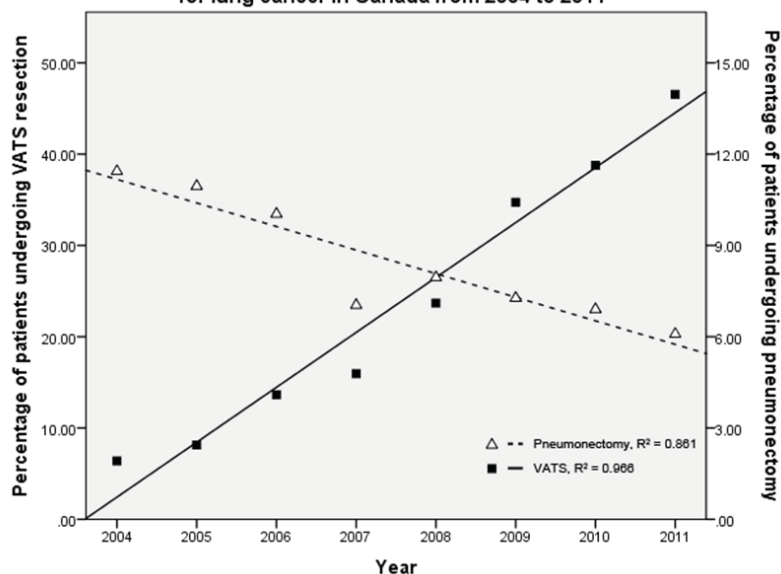


Figure 1 - Relative proportions of pneumonectomy and VATS cases per year in Canada from 2004 to 2011.

Conclusions:

The last decade has seen considerable change in the surgical practice of thoracic surgeons in Canada. There has been a significant decrease in the number of thoracotomy and pneumonectomy procedures performed. Minimally invasive surgery has historically been adopted predominantly in simpler cases but has increasingly been utilized in lobectomy and other complex thoracic surgeries over time. Overall, the type and scope of practice facing the thoracic surgeon is dramatically different than it was a decade ago.

Disclosure: No significant relationships.

F-071

IMPACT OF LYMPH NODE INVOLVEMENT AND ROLE OF LYMPHADENECTOMY IN THE SURGERY OF LUNG METASTASES OF COLO-RECTAL CANCER. RESULTS FROM THE SPANISH PROSPECTIVE COLORECTAL METASTASECTOMY REGISTRY (GECMP-CCR)

Sergi Call¹, R. Rami-Porta¹, R. Embún², J.J. Rivas De Andres², L. Molins³, J. Belda-Sanchis¹, S. Separ Gecmp-Ccr⁴

¹Thoracic Surgery Department, Mutua Terrassa University Hospital, Terrassa, Spain

²Thoracic Surgery Department, Hospital Universitario Miguel Servet, Zaragoza, Spain

³Thoracic Surgery Department, Hospital Universitari Sagrat Cor and Hospital Clinic, Barcelona, Spain

⁴Spanish Group of Lung Metastases of Colo-rectal Cancer, Spanish Society of Pneumology and Thoracic Surgery (SEPAR), Barcelona, Spain

Objectives:

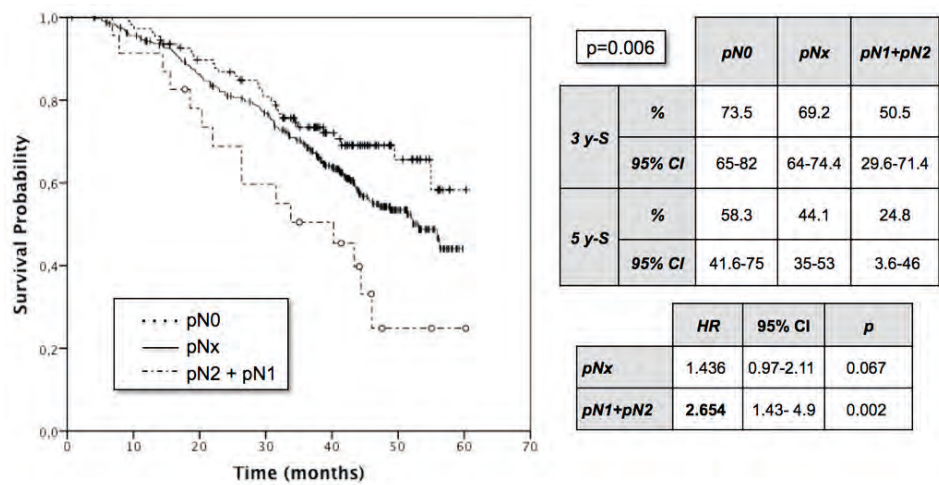
1) To describe lymph node (LN) assessment and incidence of LN involvement in the Spanish registry. 2) To identify risk factors associated with thoracic LN spread. 3) To determine the impact of LN involvement on survival.

Methods:

522 patients from 32 hospitals were prospectively registered from 2008 to 2010. Follow-up data were completed in March 2013. Lymphadenectomies were defined according to the definitions of the Bronchogenic Carcinoma Cooperative Group of SEPAR. For pathologic (p) N0, at least a systematic sampling was required, or the N status was coded as pNx. The relationship between clinical and oncological variables from colorectal episode to thoracic LN involvement was analysed by bivariate analysis. Overall survival (OS) and disease-free survival (DFS) were calculated by the Kaplan Meier method with the log-rank test for comparisons. Cox regression analysis was used to estimate the hazard ratio (HR).

Results:

Lymphadenectomy was performed in 250 (48%) patients: 50 (20%) systematic nodal dissection, 87 (34.8%) systematic sampling and 113 (45.2%) minor lymphadenectomies. Median number of resected LNs was 4 (1-41). LN involvement was found in 25 (10%) patients. LN involvement was associated with the following variables from the primary tumor: The pT ($p < 0.05$) and the site of the colorectal cancer (sigma; $p < 0.05$). The median OS and DFS of all series were 55 and 28.3 months, respectively. The 3- and 5-year survival rates and HR according to pN status are shown in figure 1. Regarding DFS, there are no significant differences among groups depending on the pN status.



Conclusions:
Lymphadenectomy in the Spanish metastasectomy registry was not uniformly performed. As a consequence, the incidence of LN involvement (10%) was slightly lower compared with other series. LN involvement remains an important prognostic factor associated with an increased risk of death and, therefore, an adequate intraoperative lymph node assessment should be performed in all metastasectomies.

Disclosure: S. Call: The GECMP-CCR-SEPAR database and the statistic analysis of this study have been funded by Ethicon-Endosurgery.
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F-072

CAN THE EGFR GENE MUTATION BE A PROGNOSTIC PREDICTIVE FACTOR IN PATHOLOGICAL STAGE I NON-SMALL CELL LUNG CANCER?

Tepei Nishii¹, T. Yokose², Y. Miyagi³, H. Ito¹, K. Yamada¹, H. Nakayama¹, M. Masuda⁴

¹Department of Thoracic Oncology, Kanagawa Cancer Center, Yokohama, Japan

²Department of Pathology, Kanagawa Cancer Center Hospital, Yokohama, Japan

³Molecular Pathology and Genetics Division, Kanagawa Cancer Center Research Institute, Yokohama, Japan

⁴Department of Surgery, Yokohama City University Graduate School of Medicine, Yokohama, Japan

Objectives:

It is essential to confirm the epidermal growth factor receptor (EGFR) gene mutation in planning strategy of treatment for advanced or recurrent non-small cell lung cancer (NSCLC). But, the importance of EGFR mutation in early stage NSCLC is uncertain. We investigated prognostic value of EGFR mutation in pathological stage I NSCLC.

Methods:

A total of 388 patients with NSCLC underwent complete resection from 2006 to 2008 were examined retrospectively using loop-hybrid mobility shift assays, a highly sensitive polymerase chain reaction-based method.

Results:

The mutations of EGFR were detected in 172/388 (44.3%). EGFR mutations were found more frequently in female (104/172, 60.5%), adenocarcinoma (170/172, 98.8%), no vascular invasion (126/172, 73.3%), and non-smoker (99/172, 57.6%). In patients with pathological stage IB adenocarcinoma, the 5-year disease free survival rate was higher in EGFR mutated patients without vascular invasion (Group A: 91.9%, n=37) than in the other patients (Group B: 68.2%, n=45) (P=0.004). Furthermore, in patients with pathological T1bN0 adenocarcinoma, the 5-year disease free survival rate was higher in Group A (100%, n=39) than Group B (91.4%, n=35) (p=0.033).

Conclusions:

Our results suggest that EGFR mutation can be a prognostic predictive factor in pathological stage I NSCLC. We should establish postoperative adjuvant therapy especially for pathological stage IB, wild type adenocarcinoma patients with vascular invasion.

Disclosure: No significant relationships.

F-073

CAN MASS PROTEOMIC ANALYSIS USING MALDI-TOF MASS SPECTROMETRY HELP FOR RAPID DIAGNOSIS OF LUNG CANCER IN THE OPERATING ROOM?

Geoffrey Brioude¹, F. Bregeon², F. De Dominicis³, D. Trousse¹, B. Orsini⁴, C. Doddoli¹, C. Flaudrops², X. D'Journo¹, D. Raoult², P. Thomas¹

¹*Department of Thoracic Surgery, Marseille University Hospital, Marseille, France*

²*Urmite, Aix Marseille University, Marseille, France*

³*Thoracic Surgery, Amiens University Hospital, Amiens, France*

⁴*Thoracic Surgery and Esophagus Diseases, Assistance Publique des Hopitaux de Marseille - Université de la Méditerranée, Marseille, France*

Objectives:

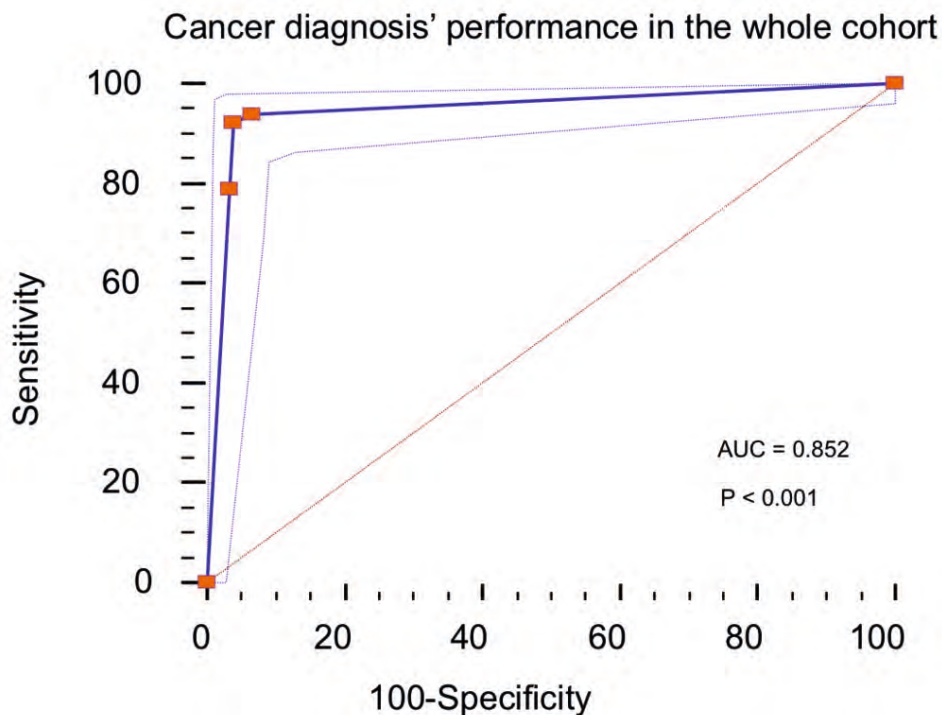
Recently, tissue-based methods using proteomic analysis have been used in clinical research on cancer and appear reliable for multiples tissue classification. Our objective was to assess the reliability of a method involving rapid tissue preparation and analysis to discriminate cancerous from non-cancerous lung tissues. We tested directly in the operating room 307 lung samples of 159 patients

Methods:

Fresh samples were crushed in water, and 1.5 µl was spotted in quadruplets onto a target for analysis with the Microflex LTTM MALDI-ToF analyzer (Bruker DaltonicsTM). Spectra were analyzed using Biotyper[®] software. The mean reference spectra (MSP) obtained from the four deposits of a same sample was included in a global database. For MSP stored in the database we indicated its nature Cancerous or Non Cancerous on the basis of the definite histological diagnosis obtained a posteriori. Non cancerous samples could include inflammatory or infectious tissue. The diagnosis performance of the MALDI-ToF to correctly classify a blind sample as Cancerous or Non Cancerous was evaluated with 3 levels of answers and graphically drawn as receptor operative curve (ROC) using the Delong method

Results:

We analyzed 127 cancerous and 180 non cancerous samples (148 normal lung biopsies and 32 inflammatory or infectious lesions). For each sample the delay of answer was less than 30 minutes. For the more discriminant level, a sample was correctly classified with a sensitivity, specificity and global accuracy of respectively 92.1%, 93.6 % and 91.5%. In the subgroup of abnormal tissues (comparing 127 cancerous samples versus 32 inflammatory or infectious samples) sample were correctly classified with sensitivity, specificity and global accuracy of respectively 92.1%, 78.5% and 89.3%



Conclusions:

The reliability of MALDI-ToF analysis coupled with a very simple lung preparation procedure appeared promising and should be tested in the operating room coupled with the pathological examination to reinforce frozen biopsy diagnosis performance

Disclosure: No significant relationships.

F-074

SYNCHRONOUS NON-SMALL-CELL LUNG CANCERS:DIAGNOSTIC YIELD CAN BE IMPROVED BY HISTOLOGIC AND GENETIC METHODS

Yiliang Zhang¹, H. Hu¹, R. Wang¹, T. Ye¹, Y. Pan¹, L. Wang¹, Y. Zhang¹, H. Li¹, Y. Li², L. Shen², Y. Yu³, Y. Sun¹, H. Chen¹

¹*Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China*

²*Department of Pathology, Fudan University Shanghai Cancer Center, Shanghai, China*

³*Department of Biostatistics, School of Public Health, Fudan University, Shanghai, China*

Objectives:

Identification of synchronous non-small-cell lung cancers (NSCLC) is important for both therapeutic and prognostic purposes. The aim of this study was to investigate the strategy using the new histologic classification and driver-mutational testing to define multi-primary lung cancers.

Methods:

A prospectively-collected data of patients treated for synchronous NSCLC was retrospectively analyzed. Cases were defined using Martini-Melamed criteria, and validated by histologic subtyping and driver mutation of selected genes. Kappa coefficient was calculated to evaluate the consistency between the diagnostic methods. Survival was estimated between patients with primary and metastatic tumors controlling by nodal (N) stage. Factors associated with prolonged survival were evaluated using Cox proportional hazards mode.

Results:

131 patients who had followed up over 12 months were enrolled in this study. Kappa coefficient showed weak strength of consistency when comparing the current criteria with histologic analysis ($p=0.0289$, Kappa=0.34, 95% CIs 0.05~0.63). However, histologic evaluation resulted in perfect agreement with the mutational method ($p<0.0001$, Kappa=0.85, 95% CI: 0.69~1.00). Controlling by N0 stage, the patients who diagnosed with multiple primary NSCLC showed better relapse-free survival (RFS) than those with intra-pulmonary metastases categorized either by the Martini-Melamed criteria or by histologic-mutational methods (both $p<.0001$). However, at N+ stage, the patients stratified by the Martini-Melamed criteria showed no difference in survival ($p=.517$), but those defined by the histologic-mutational methods still maintained superior survival as compared with the control group ($p=.042$). On multivariate analysis, only N0 and diagnosed as independent lung lesions by histologic-mutational strategy were significant predictors of better RFS ($p=.031$ and $p=.001$, respectively)

Conclusions:

The diagnostic strategy based on histologic and genetic methods may be an option for identification of synchronous NSCLC when traditional criteria were not applicable, especially in cases with positive lymphatics. N0 stage and diagnosed as independent pulmonary tumors were associated with better RFS.

Disclosure: No significant relationships.



F-075

SURVEILLANCE OF THE REMAINING NODULES AFTER RESECTION OF THE DOMINANT LESION IN MULTIFOCAL LUNG ADENOCARCINOMA IS AN APPROPRIATE FOLLOW UP STRATEGY

Massimo Castiglioni¹, C.L. Wilshire², E. Vallières², A.S. Farivar², R.W. Aye², J. Gorden², B.E. Louie²

¹Center for Thoracic Surgery, Department of Surgical and Morphological Sciences, University of Insubria, Varese, Italy

²Thoracic Surgery, Swedish Cancer Institute and Medical Center, Seattle, United States of America

Objectives:

Lung adenocarcinoma presenting as multifocal disease creates a challenge when there is a dominant lesion with additional nodules. Recent data supports resection of the dominant lesion but management of the remaining lesions is controversial. Some advocate resection of the remaining nodules that show growth or morphologic changes; whereas, others advocate surveillance owing to the slow doubling time exhibited in these lesions. We assessed the nodules remaining after resection of the dominant lesion to determine a reasonable strategy of management for these nodules.

Methods:

We retrospectively evaluated patients with multifocal lung adenocarcinoma from 2000-13 after a dominant lesion was resected. A modified Schwartz formula was used to measure volume doubling time (VDT) of the overall size of lung lesions.

Results:

Eighty-one patients underwent resection of 82 dominant lesions (Group 1) concurrently with 45 non-dominant lesions (Group 2) while 134 non-dominant lesions were radiologically surveyed (Group 3). Characteristics of the groups are compared in Table 1. Only 8/134 (6%) of the unresected lesions showed growth in size. Two of these also appeared denser. One lesion was confirmed cancer on biopsy and treated with radiation. The remaining 7 nodules are under surveillance and have changed minimally at a mean follow-up of 5.8 years. Table 1 Groups characteristics.

Characteristics	Group 1 n. 82	Group 2 n. 45	Group 3 n.134	p
Greatest diameter (cm), median (SD)	2.0 ± 1.0	0.9 ± 0.6	0.5 ± 0.5	<0.05
PET avidity (SUV>2)	41/82 (50%)	3/45 (7%)	1/134 (1%)	<0.0001
Mixed appearance at radiological films	65/82 (79%)	9/45 (20%)	8/134 (6%)	<0.0001
Volume Doubling Time (days), median (SD)	562 ± 500	806 ± 278	889 ± 649	1,2 NS 1,3 <0.05 2,3 NS

Conclusions:

These data support surveillance of the remaining nodules in patients with multifocal lung adenocarcinoma who have undergone resection of the dominant lesion. The strategy of resection of the dominant lesion followed by surveillance is reasonable with selective resection of lesions larger than 1 cm, PET avid, of mixed morphology and with shorter VDT.

Disclosure: No significant relationships.

F-076

PROGNOSTIC ROLE OF MICROVESSEL DENSITY IN PT1aN0M0 NON-SMALL-CELL-LUNG-CANCER

Fabio Davoli¹, F. Stella², G. Valente³, F. Vasuri⁴, O. Rena¹, F. Massera¹, G. Caroli², A. Bini², C. Casadio¹

¹Thoracic Surgery Unit, University of Eastern Piedmont, Azienda Ospedaliero-Universitaria Maggiore della Carità, Novara, Italy

²Thoracic Surgery Unit, University of Bologna, Policlinico S.Orsola-Malpighi, Bologna, Italy

³Department of Pathology, University of Eastern Piedmont, Azienda Ospedaliero-Universitaria Maggiore della Carità, Novara, Italy

⁴Institute of Oncology and Transplantation Pathology, University of Bologna, Policlinico S.Orsola-Malpighi, Bologna, Italy

Objectives:

To evaluate the degree of tumour angiogenesis detected by Microvessel Density (MVD) as a predictor of cancer-related death after surgical treatment in pT1aN0M0 Non-Small-Cell-Lung-Cancer (NSCLC).

Methods:

Demographic, surgical, and histopathological data, including MVD, were recorded for 82 patients (male, 60; female, 22; median age 68; range 36–82) who underwent surgical resection in two different Thoracic Surgery Units between January 2002 and December 2007 for pT1aN0M0 Non-Small-Cell-Lung-Cancer. MVD was assessed by visual count of microvessels immunostained with anti-CD31 monoclonal antibody and defined as the mean count of microvessels per 1-mm² field area. MVD was then correlated with demographic and tumour-related variables and survival.

Results:

Fifty-nine lobectomies (72%) and 23 sublobar resections (28%) were performed; a systematic lymphadenectomy was always accomplished. Histopathological findings showed 43 Adenocarcinoma (52%) and 39 Non-adenocarcinoma (48%) pT1aN0M0 patients; mean tumour diameter was 18mm (range 7–20mm). Mean MVD was 161 (CD31/mm²), median=148, range 50–365. A cut-off was established at 150. High-MVD-Expression (>150 CD31/mm²) was observed in 40 patients (49%), Low-MVD-Expression (≤ 150 CD31/mm²) in 42 patients (51%). Survival rates were calculated by the Kaplan–Meier method and compared by the log rank test. 5-years survivals were 70% and 95% for, respectively, the High-MVD-Expression-Group and the Low-MVD-Expression-Group with a p=0,0041, statistically significant (Figure 1).

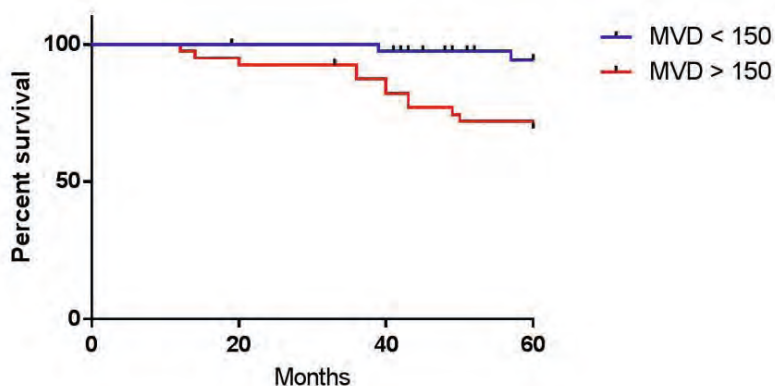


Figure 1. Kaplan-Meier Curves.

5-years Overall Survival Rates According to Microvessel Density (MVD)

High-MVD-Group = 70% vs Low-MVD-Group = 95%, $p=0,0041$

Univariate analysis revealed type of surgical resection, tumour diameter, major comorbidities and histotype not to be significant predictors of disease-related death. MVD was found to be higher in the Adenocarcinoma-group (median MVD=180) versus the Non-Adenocarcinoma group (median MVD=125), with a statistically significant Mann-Whitney test ($p < 0,0001$). According to the Adenocarcinoma-subgroup, 5-years survival rates were 66% and 93% for, respectively, High-MVD-Expression and Low-MVD-Expression patients ($p=0,043$ statistically significant).

Conclusions:

Our study indicated that Microvessel Density assessed with CD31 immunostaining has a relevant prognostic value in early lung cancer pT1aN0M0.

Disclosure: No significant relationships.

F-077

KRAS AND BRAF MUTATIONS ARE PROGNOSTIC BIOMARKERS IN PATIENTS UNDERGOING LUNG METASTASECTOMY OF COLO-RECTAL CANCER

Stephane Renaud¹, B. Romain², P.E. Falcoz¹, A. Olland¹, N. Santelmo¹, C. Brigand², S. Rohr², D. Guenot³, G. Massard¹

¹Thoracic Surgery, Nouvel Hôpital Civil, Strasbourg, France

²General and Digestive Surgery, Hôpital de Hautepierre, Strasbourg, France

³Ea3430: Tumoral Progression and Micro-environnement. Translational and Epidemiological Approaches, Strasbourg University, Strasbourg, France

Objectives:

We aimed to evaluate codon 12/13 KRAS (mKRAS) and BRAF (mBRAF) as prognostic factors in lung metastasectomy of colo-rectal cancer (CRC).

Methods:

From January 1998 and December 2011, data from 185 patients who underwent a lung metastasectomy for CRC at the thoracic surgery department of Strasbourg University Hospital, for whom mutational status was known, were reviewed. Primary end point was overall survival (OS).

Results:

Mean age at time of thoracic metastasectomy was 63.35 years-old (+/- 9.66). Median follow-up time was 42 months (2 – 122). Molecular analysis revealed mKRAS in 93 patients (51.7%) and mBRAF in 19 patients (10.6%). In univariate analysis, OS was significantly influenced by thoracic nodal status (median OS: 98 months (95% CI: 83.33 – 112.66) for pN- patients, 27 months (95% CI: 15.32 – 38.68) for pN+, $p<0.0001$), multiple thoracic metastases (75 months versus 101 months, $p=0.008$) or a history of liver metastase (94 months versus 101 months, $p=0.04$). mBRAF patients had a significantly worse OS than mKRAS and WT patients ($p<0.0001$). The 5-year OS was 0%, 44% and 100%, with corresponding median OS of 15 months, 55 months and 98 months respectively ($p<0.0001$). In multivariate analysis, absence of nodal involvement (HR: 0.44 (95% CI: 0.27 – 0.73), $p=0.001$), wild type BRAF (HR: 0.2 (95% CI: 0.08 – 0.45), $p<0.0001$) and wild type KRAS (HR: 0.14 (95% CI: 0.05 – 0.39), $p<0.0001$) had a significant impact on OS.

Conclusions:

Both mKRAS and mBRAF seem to be prognostic factors in lung metastasectomy of CRC. Further study are necessary to validate these results.

Disclosure: No significant relationships.

F-078

BMI AS A PROGNOSTIC FACTOR IN RESECTED LUNG CANCER. OBESITY OR LEPTOSOME, WHICH IS THE RISK FACTOR?Takeshi Matsunaga, K. Suzuki, K. Takamochi, S. Oh*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

In general, obesity was thought to be associated with increased surgical mortality and morbidity. On the other hand, low body mass index (BMI) has recently been reported as a poor prognostic factor for surgical candidates. This study investigated the effect of BMI for lung surgery.

Methods:

A retrospective study was conducted on consecutive 1518 patients with resected malignant pulmonary tumors between February 2008 and March 2013. BMI was used to classify patients as follows according to the WHO definition; BMI<18.5: underweight (UW) , 18.5≤BMI<25: normal weight(NW), 25≤BMI<30: overweight(OW) , BMI>30: obese(OB). We defined mortality related surgical resection as any patients died within 90 days after resection, or in-hospital death. Among four groups, we analyzed morbidity and mortality related surgical resection. Furthermore, we investigated preoperative factors and logistic regression analysis was conducted for identifying the predictor for mortality related surgical resection.

Results:

There were 873 men (58%) and 645 women (42%), age ranged 5 to 90 with median of 67. Among four groups, the incidence of morbidity was 24.8%(34/137) in UW, 21.1%(213/1009) in NW, 17.3%(52/301) in OW and 19.2%(5/26) in OB, that of cardiovascular complication, 8.8%(12/137) in UW, 8.6%(87/1009) in NW, 7.3%(22/301) in OW, 4%(1/26) in OB, that of cerebrovascular complication, 1.5%(2/137) in UW, 0.4%(4/1009) in NW, 0%(0/301) in OW, 0%(0/26) in OB, and that of pulmonary complication, 13.1%(18/137) in UW, 8.4%(85/1009) in NW, 7.3%(22/301) in OW, 7.6%(3/26) in OB. Mortality related surgical resection was 2.9%(4/137) in UW, 0.6%(6/1009) in NW, 1.7%(5/301) in OW and 0%(0/26) in OB. In multivariate analysis, predictors for it were underweight(UW)(HR; 4.86, CI; 1.38-17.12), %DLCO(HR; 0.26, CI; 0.09-0.79) and male(HR; 11.22, CI; 1.43-88.39), significantly.

Conclusions:

In this study, low BMI was independent risk factor for mortality and the incidence of cerebrovascular and pulmonary complications tends to be more frequency in low BMI than in obesity. Leptosome should be cared intensively following pulmonary resection for lung malignancy.

Disclosure: No significant relationships.

**TUESDAY, 17 JUNE 2014****13:00 - 14:00****SESSION XI: VIDEOS II****V-079****TECHNIQUES OF VIRTUAL ASSISTED LUNG MAPPING (VAL-MAP)**

Masaaki Sato, T. Yamada, T. Menjyu, A. Aoyama, T. Sato, F. Chen, M. Sonobe, M. Omasa, H. Date

Thoracic Surgery, Kyoto University, Kyoto, Japan

Objectives:

To navigate precise sublobar lung resection (wedge resection or segmentectomy), we developed virtual-assisted lung mapping (VAL-MAP), a bronchoscopic multi-spot dye-marking technique utilizing 3D-virtual imaging. We have mapped nearly 350 points in approximately 100 cases in our institute. The purpose of the interactive presentation is to share technical tips of VAL-MAP.

Video description:

Two-to-six mapping points were designed on the lung surface according to operation plan. Virtual bronchoscopy was used to select target bronchi reaching the points. With mild sedation, a regular flexible bronchoscopy was inserted and indigo carmine was injected to each target bronchi through a metal-tip catheter. Additional CT scan was taken to confirm mapping points, which were then displayed on 3D lung image to navigate actual operation. The following dye-injection technique has been established. First, advance the catheter preloaded with 1 ml of indigo carmine, observing the location using fluoroscopy; once the catheter reaches the pleura, the 3-way stopcock connecting the catheter and a syringe containing air (10 ml) is opened; the catheter tip is wedged and resistance is felt through the plunger. Second, the catheter is slowly withdrawn while feeling the resistance on the plunger until the point where the resistance suddenly decreases and the plunger can be easily pushed. Third, the catheter is slightly advanced during injection; this maneuver dilates the peripheral bronchus to keep extra air escaping beside the catheter while spraying the dye into alveoli. Additionally, the posterior part of the lung is better mapped at lateral decubitus position, which inflates the peripheral lung better. Lastly, although the tip of the injection technique is somewhat subjective, we found a grading system of the intraoperative findings of mapping helps to improve the quality of lung mapping.

Conclusions:

VAL-MAP is useful for precise navigation of sublobar lung resection. Techniques for better quality of VAL-MAP have been established

Disclosure: No significant relationships.

V-080

INTRAOPERATIVE DYNA-CT TO RESECT UNPALPABLE LUNG CANCER

Tohru Sakuragi¹, H. Hisano², Y. Kakiuchi³, Y. Nakayama¹, S. Morita⁴

¹*Thoracic and Cardiovascular Surgery, Osumi-Kanoya Hospital, Kanoya, Japan*

²*Radiology, Saga University, Saga, Japan*

³*Anesthesiology, Ohta Memorial Hospital, Fukuyama, Japan*

⁴*Thoracic and Cardiovascular Surgery, Saga University, Saga, Japan*

Objectives:

Pure ground glass nodules (GGN), early lung cancer with only lepidic growth, may be treated surgically by sublobar resection or segmentectomy. Localization of these lesions is challenging in Video Assisted Thoracic Surgery (VATS). Marking of these tumors using hook wires, dyes, or contrast media under preoperative CT guidance has been reported. However, lack of general anesthesia during the CT intervention does cause anxiety in the patients. The use of hook wires has been recently linked with fatal cerebral and cardiac air embolism. DynaCT allows the reconstruction of CT-like images in hybrid operating rooms without the need of transporting and repositioning the patient on an operating table.

Video description:

In a 63 year old male patient, we performed VATS with 3 ports using intraoperative tumor marking by DynaCT guidance. The patient was placed in a lateral position. After insertion of the thoracoscope, the re-inflated lung was scanned by DynaCT, which showed all three shadows. Based on the DynaCT view, two needle markers (4-0 prolene®) were placed on the lung surface through the surgical port to have landmarks indicating the nodules. A subsequent lung scan demonstrated the spatial relationship between markers and nodules. A third needle was placed as a landmark to ensure sufficient surgical margins for anatomical segmentectomy, which was confirmed by a third DynaCT scan. The patient underwent a radical right middle lobectomy for solitary lung adenocarcinoma, and limited resections for adenocarcinomas in situ in the right upper lobe (segmental resection of the posterior segment and partial resection of the anterior segment) by VATS. The patient is free of recurrence 2 years postoperatively.

Conclusions:

We believe that this novel technology has great potential for lung cancer surgery because it allows the identification of small target tumors and safety margins and thereby increases the surgeon's confidence during the procedure.

Disclosure: No significant relationships.



V-081

NEAR INFRARED (NIR) IMAGE GUIDED SENTINEL LYMPH NODE IDENTIFICATION IN LUNG CANCER

Yolonda L Colson, K.J. Hachey, D.M. Gilmore, O.V. Khullar, S.E. Harris, M.T. Jaklitsch
Thoracic Surgery, Brigham & Women's Hospital, Boston, United States of America

Objectives:

To evaluate an intraoperative, minimally invasive near infrared (NIR) image-guided approach to sentinel lymph node (SLN) identification in lung cancer patients for initial safety and feasibility. Despite “curative” resection, recurrence rates are nearly 40% in early stage non-small cell lung cancer (NSCLC) and five year survival is less than 60%, outcomes largely attributable to missed nodal disease. The primary aim of SLN mapping in lung cancer is to identify the nodes at greatest risk for metastases (i.e. SLNs) for focused immunohistochemical and molecular analysis to improve staging and outcomes in this disease.

Video description:

In this pilot trial of 41 patients with suspected stage I/II NSCLC, peritumoral injection of NIR dye indocyanine green (ICG) was performed at the time of surgery and SLNs were detected using an NIR-specific endoscope. The SLN identification rate increased in an ICG dose-dependent fashion with 100% SLN identification at 2.5mg ICG diluted in 1cc of human serum albumin. A total of 28 SLNs were identified in 17 patients, with 28.5% of nodes found at the N2 station. The histopathologic status of SLNs was 100% predictive of the greater lymphadenectomy specimen. There were no adverse events. This video demonstrates the key aspects of this reproducible NIR-guided SLN biopsy technique as well as in vivo ICG lymphatic migration and nodal uptake.

Conclusions:

NIR image-guided SLN identification is safe and feasible in lung cancer, permitting minimally invasive, intraoperative visualization of SLNs without distortion of intrathoracic structures. The rate of SLN identification is 100% at an optimal ICG dose of 2.5mg. SLN biopsy in lung cancer has the potential to improve staging, identify micrometastatic disease with focused analysis and aid in the selection of patients who may benefit from adjuvant chemotherapy.

Disclosure: Y.L. Colson: Invited Speaker to Novadaq iSPIES conference – accommodation and airfare

V-082

COMPLEX RECONSTRUCTION OF A LARGE ANTERIOR CHEST WALL DEFECTJaroslaw Kuzdzal, P. Kocon, T. Smeder*Thoracic Surgery, Jagiellonian University, John Paul II Hospital, Krakow, Poland***Objectives:**

The objective of this video is to present the original technique of reconstruction of a large defect of the anterior chest wall

Video description:

The most important single prognostic factor of recurrence-free survival in patients with chondrosarcoma in the surgical margin. Its optimal width is reportedly 4 cm. If such a margin is used in resection of a large chondrosarcoma of the anterior chest wall, the post-resectional defect may be very large. Reconstruction of such defect is challenging. It requires restitution of the chest wall integrity and sufficient protection of intra-thoracic organs, whilst preserving its mobility necessary for effective respiratory movement. There is no single prosthetic material available that could replace the costo-chondral skeleton of the anterior chest wall, providing maintenance of the shape of the chest, protective and respiratory function. In the presented patient, resection of a large chondrosarcoma originating from the costal arch resulted in an extensive defect, including the whole sternal body with adjacent rib segments, both costal arches as well as soft tissue: pectoralis major and serratus anterior muscles, part of the right breast and large area of skin. To reconstruct the costo-chondral skeleton, combination of two kinds of prosthetic material was used: the double mesh-methyl methacrylate ‘sandwich’ was used to replace the sternum and the Codubix polypropylene-polyester rib prostheses were used to reconstruct the ribs. The continuity of the structural layer of the chest wall was restored using a polypropylene mesh. The soft-tissue coverage was accomplished using a pedicled omental flap covered with a split-thickness meshed skin graft. The postoperative course was uneventful

Conclusions:

The use of prosthetic materials of different mechanical characteristics to reconstruct elements of the anterior chest wall results in a repair with structural and functional features of the native chest wall. It can be used for reconstruction of large post-resectional defects

Disclosure: No significant relationships.



V-083

INSTRUCTIVE VIDEO FOR ANATOMICAL SEGMENTECTOMY OF THE LUNG USING INTRAOPERATIVE VIDEO AND CG ANIMATIONHideki Miyazawa, T. Arai*Chest Surgery, Toyama Prefectural Central Hospital, Toyama, Japan***Objectives:**

Though segmentectomy of the lung is infrequently performed, thoracic surgeons should have the accurate knowledge of the anatomy of the lung to perform the complete and safe segmentectomy. The conventional surgical textbooks or operation videos cannot sufficiently convey a sense of operation. As the anatomy of the lung has various variations of the vessels and bronchi, we are making instructive videos for young thoracic surgeons, which show the operation technique by comparing computer graphic (CG) animations with intra-operative videos. In this presentation video, we demonstrate the technical difference in resection of the left apicoposterior segment (S^{1+2}) with two typical anatomical variations of the pulmonary vein.

Video description:

Two operation videos were selected from the surgical video library of our hospital. The CG animations were created in reference to operation videos and carefully synchronized to the intra-operative video. Furthermore, we contained the CG animation of the lung anatomy on this instructive video to facilitate the visual and intuitive understanding of the corresponding anatomical relationship between bronchi and pulmonary vessels. One of the anatomical variations is an apical vein type that $V1+2b+c+d$ courses superiorly to B3 to join $V1+2a$, and another is an apico-central vein type that $V1+2b+c+d$ courses deep inferiorly to B3 to empty into the central vein. In an apical vein type, it is possible to perform segmentectomy by approach only from the anterior mediastinum side. In an apico-central vein type, it is necessary to start the division of $S1+2$ from the both side of anterior and posterior mediastinum. We can understand the difference in both anatomy and method easily by comparing CG with an operation video.

Conclusions:

Our instructive video that is combined the intra-operative video with the CG animation can convey the technical know-how of lung segmentectomy. We are now making the instructive video series of lung segmentectomy for young thoracic surgeons.

Disclosure: No significant relationships.

V-084

CERVICOSTERNOTOMY WITH THORACOTOMY FOR METASTATIC ADENOPATHY

Alberto Oliaro, P.L. Filosso, P. Lausi, F. Guerrera, A. Sandri, E. Ruffini
Thoracic Surgery, University of Torino, Torino, Italy

Objectives:

Testicular neoplasms may determine metastases in latero-cervical and mediastinal lymph nodes. Thoracic surgery's role consists in performing a lymphadenectomy which oftentimes requires a quite invasive approach.

Video description:

We present a clinical case in which the removal of lymph nodes in cervical and mediastinal site was performed through an access which implied the execution, in the same surgical time, of a transversal cervicotomy, a total median longitudinal sternotomy and a left anterior thoracotomy. Through this approach it was possible to achieve a radical excision of the cervico-mediastinal adenopathy.

Conclusions:

This video demonstrates that through a cervico-sternothomic surgical access along with an anterior thoracotomy, it is possible to obtain the radical removal of the neoplastic disease with an optimal mediastinal structures control.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014**14:00 - 15:00****SESSION XII: INTERESTING CASES****O-085****ALTERNATIVE APPROACH TO BILATERAL SYNCHRONOUS BRONCHOGENIC CARCINOMA**

Carme Obiols, S. Call, R. Rami-Porta, J.C. Trujillo-Reyes, M. Iglesias, R. Saumench, M. Serra-Mitjans, J. Belda-Sanchis

Thoracic Surgery Department, Hospital Universitari Mutua Terrassa, Terrassa, Spain

Objectives:

To describe the utility of the transcervical approach for staging, diagnostic and therapeutic purposes.

Case description:

68-year-old male patient with past history of smoking, radical cystectomy for bladder cancer, ischemic heart disease and peripheral vasculopathy. A surveillance computed tomography of the chest showed a 35-mm cavitated mass in the left lower lobe (LLL) and a 12-mm nodule in middle lobe (ML). Positron emission tomography only showed an abnormal uptake in the LLL lesion. Bronchoscopy did not find macroscopic abnormalities and cytological studies were negative. Pulmonary function tests were normal. With the clinical suspicion of bilateral synchronous bronchogenic carcinoma, a transcervical approach was planned for staging and diagnostic purposes. A videoassisted mediastinal lymphadenectomy (VAMLA) and an extended cervical mediastinoscopy (ECM) were performed. In the same procedure, using unipulmonary ventilation, the right mediastinal pleura was opened to perform a mediastino-thoracoscopy. The nodule in the ML was identified and resected with endostaplers (figure 1). No complications were observed, and the patient was discharged from hospital a day after surgery. Pathological findings were: a 7-mm solid mucinous adenocarcinoma in the ML nodule and no evidence of malignancy in all resected lymph nodes (n=16). One week later, a video-assisted (VATS) left lower lobectomy was performed and the pathological analysis diagnosed a 20-mm squamous cell carcinoma (pT1aN0M0). A month later, a VATS middle lobectomy was completed. Pathological analysis showed multiple small nodules of solid mucinous adenocarcinomas in the visceral pleural (pT3N0M0).

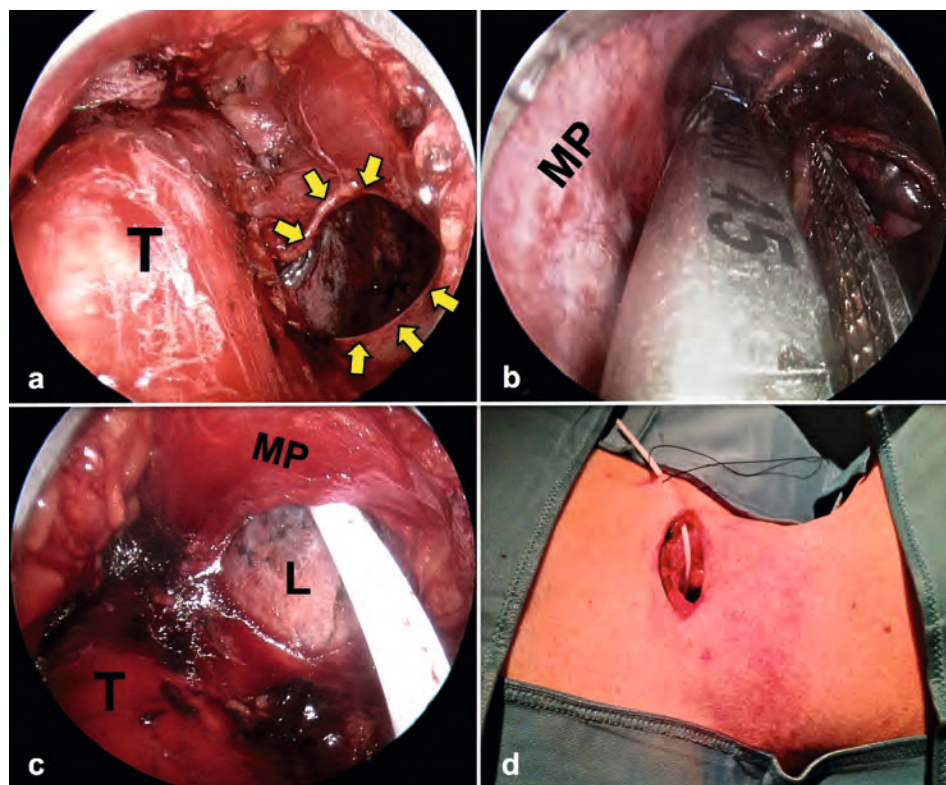


Figure 1. a) Videomediastinoscopic view of the opened right mediastinal pleura (yellow arrows). b) Wedge resection of the ML nodule using an endostapler through the bivalve mediastinoscope. c) View of the small-bore chest drainage introduced in the pleural cavity after lung reexpansion. d) Exteriorisation of the drainage next to the cervical incision. Abbreviations: T: trachea; MP: mediastinal pleura; L: lung.

Conclusions:

Transcervical approach was useful for precise mediastinal staging and lymphadenectomy (VAMLA + ECM). VAMLA combined with VATS lobectomy could be a good option for a radical lymphadenectomy. Moreover, using the same cervical incision, the exploration of the pleural cavity can be performed, allowing the resection of pulmonary nodules.

Disclosure: No significant relationships.



O-086

LIFE-THREATENING COMPLICATION OF COLON INTERPOSITION AFTER ESOPHAGECTOMY

Yury Peysakhovich¹, C. Schieman¹, M. Danter², C.J. Finley¹, W.C. Hanna¹, A. Al-Khalifa², Y. Shargall¹

¹*Thoracic Surgery, McMaster University, Hamilton, Canada*

²*Cardiac Surgery, McMaster University, Hamilton, Canada*

Objectives:

Fistula between intrathoracic conduit replacing an esophagus and adjacent organs is a rare and challenging situation with high mortality rate.

Case description:

We present a 47 years old woman with congenital esophageal atresia. During childhood she underwent several operations, eventually with colon replacement of her esophagus. Subsequently, she developed dysphagia and severe reflux that required two redo thoracotomies and a laparotomy to revise her colo-gastric anastomosis and shorten a redundant colon conduit, with PEG insertion for nutritional supplementation. She presented with progressive weight loss, uncontrolled chest pain and massive upper GI bleeding. A fistula was found between the left ventricle (LV) and the colonic conduit. She underwent urgent sternotomy, repair of LV pseudoaneurysm and colon-LV fistula using cardiopulmonary bypass and closure of defect in the colon by autologous pericardial patch. Pre and intraoperatively she required massive blood transfusions. In early postoperative period she developed leak from the intrathoracic colon to the pericardial space with associated pericarditis and mediastinitis. She required redo left thoracotomy, major decortication, debridement and attempted primary repair of complex defect in the colonic conduit with intercostal muscle buttressing. Few days later she developed sepsis and underwent re-do sternotomy and wide debridement. She remained with an open sternum. After achieving infection control and negative fluid balance re re-do thoracotomy and resection of the intra-thoracic colon, proximal stomach and distal esophagus was carried, together with diverting cervical esophagostomy. Subsequently she underwent delayed sternal closure. She had long recovery, but was eventually discharged with improvement of her nutritional status and no evidence of infection. One year after discharge she is alive and well, awaiting final reconstruction with a gastric conduit.

Conclusions:

Her case illustrates that prompt diagnosis and aggressive staged surgical treatment of LV to intrathoracic colon fistula may prevent an otherwise fatal outcome of this unusual problem.

Disclosure: No significant relationships.

O-087

TREATMENT STRATEGY OF CONTRALATERAL RECURRENCE FOLLOWING PREVIOUS PNEUMONECTOMY FOR BRONCHIAL CARCINOMA

Arthur Kostron, I. Opitz, D. Schneiter, P. Kestenholz, I. Inci, S. Hillinger, W. Weder
Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland

Objectives:

To emphasize the possibilities of lung resection in patients with multiple primary lung cancers.

Case description:

A 45 year old woman diagnosed for central adenocarcinoma of the left upper lobe in 1996 underwent left sided pneumonectomy. An adjuvant radiotherapy of the mediastinum was performed because of definitive tumor stage pT2 pN2 cM0, UICC stage IIIA. No local recurrence was noted in the follow-up until in 2007 a stage IB squamous cell carcinoma of the right upper lobe was diagnosed. Simultaneously a mycotic infection of the upper lobe was secured by bronchoscopy. After further tests including pulmonary function tests and V/Q scan as well as thorough consideration of perioperative risk we decided after interdisciplinary discussion to perform a resection of the upper lobe cancer. A sleeve resection of the right upper lobe was performed under cardiopulmonary bypass assist. Six years after right upper sleeve-lobectomy for stage IB adenocarcinoma and 13 years after left sided pneumonectomy because of stage IIIA squamous cell carcinoma no signs of local recurrence or metastasis are present. Pulmonary function and quality of life as well as exercise tolerance are exceptionally good although she lives with unilateral middle and lower lobe only.

Conclusions:

This case outlines that going beyond standard considerations for lung cancer resection in a selected patient leads to an exceptional result.

Disclosure: No significant relationships.

O-088

HOW WOULD YOU REPAIR A BRONCHO-ESOPHAGEAL FISTULA?L. Haddad¹, C. Peillon¹, Jean Marc Baste¹, P. Litzler²¹*Unit of General and Thoracic Surgery, University Hospital of Rouen, Rouen, France*²*Unit of Vascular and Cardiothoracic Surgery, University Hospital of Rouen, Rouen, France***Objectives:**

Introduction: Despite advances in endoscopic treatments, there are complex tracheo oesophageal fistulas (left side, tracheo-bronchial location, posterior face) that require challenging surgical management, often in salvage situation. Herein we describe an innovative technique combining intercostal flap and endobronchial stenting, to repair left broncho-oesophageal fistulas, even in emergency, with efficient ventilation management. **Method:** We retrospectively analyzed two similar cases of patients who presented a broncho-eosophageal fistula focusing on surgical technique and ventilation support.

Case description:

Patients and Results: The two patients had the fistula on the left main bronchus complicating chemoradiotherapy for oesophageal cancer, without any recurrence of cancer. Endoscopic treatment failed with increase of the fistula and destruction of the bronchial membranous. The first patient, a fifty year old woman, arrived with Acute Respiratory Distress Syndrome (ARDS) because of a massive fistula with left pneumonitis. She was operated in emergency with a femoro-femoral veno-arterial ECMO (Extra Corporeal Membrane Oxygenation) by right thoracotomy, for oesophagectomy and reconstruction of the left bronchus by a vascularized patch of intercostal flap. Stenting with a self expansive fully covered stent, was performed on the tenth day, due to persistence of the bronchial fistula (figure 1). Unfortunately the patient died at 3 months of cerebral bleeding, but the bronchus was healed. For the second patient, surgical and ventilation management was exactly the same but the stent was inserted, after the surgery, in prevention of fistula and bronchomalacia. After 3 months, the stent was removed and the left bronchus was healed. The digestive tract was repaired by a gastroplasty.

Conclusions:

Complex tracheo oesophageal fistulas should be treated before respiratory complications or emergency contest, by combining a tracheo bronchial reconstruction with intercostal flap, and transient stenting, allowing cicatrization of the bronchus without malacia and stenosis.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014**14:00 - 15:30****SESSION XIII: OESOPHAGUS/MEDIASTINUM****F-089****ADEQUACY OF VIDEO-ASSISTED THORACIC SURGERY THYMECTOMY FOR ONCOLOGICAL OPERATION: COMPARISON WITH THE TRANSSTERNAL APPROACH**

Hiroyuki Agatsuma¹, K. Yoshida¹, I. Yoshino², M. Okumura³, Y. Fujii⁴, M. Higashiyama⁵, K. Suzuki⁶, M. Tsuchida⁷, J. Usuda⁸, H. Niwa⁹

¹*Thoracic Surgery, Shinshu University, Matsumoto, Japan*

²*Department of General Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan*

³*General Thoracic Surgery, Osaka University Graduate School of Medicine, Suita, Japan*

⁴*Department of Oncology, Nagoya City University Graduate School of Medical Sciences, Nagoya, Japan*

⁵*Thoracic Surgery, Osaka Medical Center for Cancer and Cardiovascular Diseases, Osaka, Japan*

⁶*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan*

⁷*Division of Thoracic and Cardiovascular Surgery, Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan*

⁸*Thoracic Surgery, Nippon Medical School, Tokyo, Japan*

⁹*Thoracic Surgery, Seirei Mikatahara General Hospital, Hamamatsu, Japan*

Objectives:

Video-assisted thoracic surgery (VATS) thymectomy has become an accepted method for the treatment of thymomas. The aim of this study was to evaluate the long-term outcomes associated with VATS and transsternal surgery.

Methods:

This study is a multi-institutional, retrospective study of data collected from 2,235 patients who participated by the Japanese Association for Research on the Thymus (JART). These patients underwent thymectomy for thymoma treatment, from 1991 to 2010. Of these patients, 331 underwent VATS thymectomy (VATS group) and 1,904 underwent thymectomy via the transsternal approach (sternotomy group). We statistically compared patient characteristics, tumor size, morbidity, positive surgical margin, recurrence locations, recurrence-free survival (RFS) rates, and overall survival (OS) of the two groups.

Results:

The median follow-up time was 42 months (range, 0–191 months) in the VATS group and 61 months (range, 0–256 months) in the sternotomy group. According to the Masaoka stage classification system, 902 patients (40.4%) presented with Masaoka stage I; 889 (39.8%) with stage II; 289 (12.9%) with stage III; and 155 (6.9%) with stage IV. There was no surgery-related



mortality. No differences were observed between the two groups with regard to the positive surgical margin, local recurrence, and postoperative pleural dissemination. Relatively smaller tumor size, earlier stage thymomas (Masaoka stage I, II), and less morbidity was observed in the VATS group than the sternotomy group. The VATS group showed better OS ($p < 0.001$) and RFS ($p = 0.016$) than the sternotomy group.

Conclusions:

VATS thymectomy was associated with lesser morbidity and showed better prognosis than the transsternal approach. The recurrence patterns suggest adequate local clearance of VATS thymectomy. Therefore, VATS can be used as a potential method for the management of patients with thymomas

Disclosure: No significant relationships.

F-090

MINIMALLY INVASIVE STRATEGY OF MEDIASTINAL STAGING OF LUNG CANCER

J. Hauer¹, L. Trybalski¹, A. Szlubowski², P. Kocon¹, P. Talar¹, J. Warmus¹,
Jarosław Kuzdzal¹

¹*Thoracic Surgery, Jagiellonian University, John Paul II Hospital, Krakow, Poland*

²*Endoscopy Unit, John Paul II Hospital, Krakow, Poland*

Objectives:

The aim of the study is to analyse the ability of the minimally invasive strategy combining PET, EBUS-NA and EUS-NA to rule out mediastinal nodal metastases of lung cancer.

Methods:

In consecutive patients with primary lung cancer the preoperative staging included PET scanning, EBUS-NA and EUS-NA. Patients who were re-staged after induction chemotherapy were not included in the study. Those in whom this minimally invasive staging protocol did not confirm mediastinal nodal metastases underwent pulmonary resection with systematic lymph node dissection. The negative predictive values of the combined EBUS-NA/EUS-NA as well as of combined PET/EBUS-NA/EUS-NA were calculated.

Results:

There were 532 patients (367 men and 165 women), mean age was 65 years (range: 30-84). The tumour location was the right upper lobe in 134 patients, in middle lobe in 24, right lower lobe in 88, right central in 42, left upper lobe in 135, left lower lobe in 80 and left central in 29. There were 276 squamous carcinomas, 150 adenocarcinomas, 22 large cell carcinomas, 40 – adeno-squamous carcinomas, 4 small cell carcinomas, 21 carcinoids and 19 others types. There were 421 lobectomies, 55 pneumonectomies, 51 bilobectomies and 5 sublobar resections performed. In all patients systematic lymph node dissection was performed. The mean number of lymph nodes removed was 22. The negative predictive value of combined EBUS-NA/EUS-NA was 89.8% and for PET/EBUS-NA/EUS-NA it was 93.2%.

Conclusions:

In lung cancer patients with lung cancer and the mediastinum negative on PET and negative result of combined EBUS-NA/EUS-NA, the risk of mediastinal nodal metastases is low. In these patients invasive mediastinal staging may not be necessary.

Disclosure: No significant relationships.

F-091

IS FDG PET/CT USEFUL IN DIFFERENTIAL DIAGNOSIS OF THE ANTERIOR MEDIASTINAL TUMORS?

Tatsuaki Watanabe¹, Y. Okada¹, R. Goto², H. Notsuda¹, M. Noda¹, T. Sado¹,
Y. Matsumura³, T. Kondo¹

¹*Thoracic Surgery, Institute of Development, Aging and Cancer, Tohoku University, Sendai, Miyagi, Japan*

²*Nuclear Medicine And Radiology, Institute of Development, Aging and Cancer, Tohoku University, Sendai, Miyagi, Japan*

³*Chest Surgery, Ohtanishinouchi Hospital, Koriyama, Japan*

Objectives:

The purpose of this study is to assess the usefulness of FDG PET/CT in differential diagnosis of the anterior mediastinal tumors and in the treatment strategy of them.

Methods:

The data of 123 consecutive patients with anterior mediastinal masses (54 men, 69 women; age range 17-84 y; mean age 51.7 ± 17.5 y) were evaluated retrospectively. All patients underwent FDG PET/CT and they were diagnosed by histological examination in our institution.

Results:

The average and standard deviation of SUV max of each histology were as follows; low-risk thymomas (n= 34; 4 type A, 13 type AB, and 17 type B1) : 3.5 ± 1.4 , high-risk thymomas (n=18; type B2 and 7 type B3) : 4.0 ± 1.9 , thymic carcinomas (n=4) : 11.3 ± 2.7 , atypical carcinoids (n=4): 6.4 ± 1.2 , malignant germ cell tumors (n=3; a seminoma, a germinoma, and an embryonal carcinoma): 9.4 ± 5.3 , mature teratomas (n=8): 3.0 ± 1.8 , lymphomas (n=15: 6 diffuse large B cell lymphomas, 3 precursor T lymphoblastic lymphomas, 4 Hodgikin's lymphomas, 2 MALTs): 11.9 ± 7.8 , thymic hyperplasias (n=7): 1.4 ± 0.7 , and thymic cysts (n=23): 1.0 ± 0.3 . There was no significant difference in SUV max between the low risk thymomas and the high risk thymomas. There was no significant difference in SUV max between the thymomas and the mature teratomas and thymic carcinoids. The SUV max of the thymomas was significantly higher than that of the thymic hyperplasia and the thymic cysts. The SUV max of the thymomas was significantly lower than that of the thymic cancers, the malignant germ cell tumors and the lymphomas.

Conclusions:

FDG PET/CT is useful for distinguishing the thymomas from the malignant diseases and the benign diseases. High SUV max of mediastinal tumors may indicate biopsy before radical treatment.

Disclosure: No significant relationships.

F-092

THE DISCUSSION OF COMMON HEPATIC ARTERY LYMPH NODE DISSECTION IN SURGERY FOR THORACIC ESOPHAGEAL SQUAMOUS CELL CARCINOMA

Xiao Ma, B. Li, S. Yang, W. Guo, J. Xiang, Y. Zhang, H. Chen, H. Li
Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

Common hepatic artery lymph node dissection is regarded as a standard procedure in esophageal cancer surgery. However, it is at an increased risk of postoperative complications after lymph node dissection. Here, we aimed to identify whether common hepatic artery lymph node dissection can be safely omitted in surgery for thoracic esophageal squamous cell carcinoma.

Methods:

Among a total of 1563 esophageal cancer patients who underwent surgery from May 2005 to December 2012 at the Fudan University Shanghai Cancer Center, 1248 thoracic esophageal squamous cell carcinoma were selected for this study, including 682 patients who underwent esophagectomy with common hepatic artery lymph node dissection and 566 patients who underwent esophagectomy without common hepatic artery lymph node dissection. The clinical data of patients were retrospectively analyzed. In addition, the locoregional lymph node metastasis, relationship between metastatic rates of common hepatic artery lymph node and clinicopathological factors were analyzed. A propensity analysis was performed to control for potential differences in the characteristics of patients with esophageal cancer cell carcinoma, and postoperative complications were analyzed after propensity score-matching.

Results:

The metastatic rate of common hepatic lymph node is only 3.5%. Logistic regression analysis revealed tumor diameter, N classification and pTNM stage were risk factors for common hepatic lymph node metastasis. Matching based on propensity scores produced 361 patients in each group. The overall incidence of postoperative complications was 32.70% and 35.45%, respectively, no significant difference was found ($p=0.432$).

Conclusions:

The metastatic rate of common hepatic artery lymph node is the lowest. For patients who suffered from thoracic esophageal squamous cell carcinoma at stage I after preoperative evaluation, the dissection of common hepatic artery lymph node can be safely omitted in surgery.

Disclosure: No significant relationships.



F-093

THE ROLE OF HAEMATOLOGICAL MARKERS IN PATIENTS UNDERGOING THYMECTOMY: A MULTICENTRE STUDY FROM THE UNITED KINGDOM

Shruti Raut¹, F. Granato¹, L. Kelly², A. Kirk², M. Scarci³

¹*Department of Thoracic Surgery, Papworth Hospital NHS Foundation Trust, Papworth Everard, United Kingdom*

²*Dept of Thoracic Surgery, Golden Jubilee National Hospital, Clydebank, United Kingdom*

³*Cardiothoracic Surgery, Papworth Hospital NHS Foundation Trust, Papworth Everard, United Kingdom*

Objectives:

Thymomas and thymic carcinomas are epithelial tumours arising from the thymic gland (TETs). The incidence in the United States is 0.15/100,000/year. In 10-15% of cases, TETs are associated with Myasthenia Gravis (MG). The role of haematological markers, such as acute phase proteins (APP), neutrophil:lymphocyte ratio (NLR) and platelet:lymphocyte ratio (PLR) is still uncertain. The aim of this multicentre retrospective study is to evaluate the pre-operative significance of APP, haemoglobin, neutrophil count (NC), lymphocyte count (LC), NLR and PLR in patients with TETs undergoing thymectomy and assess their impact on the clinical outcome of MG.

Methods:

One hundred and thirteen consecutive patients undergoing thymic resection from August 2004 to May 2013 were retrospectively analysed. Age, gender, pre-operative LC, NC, NLR, PLR, haemoglobin, albumin, myasthenia status and post-operative medical treatment were evaluated. Two patients with diagnoses of malignancy other than TETs were excluded. Three patients were excluded due to loss to follow up. Two groups were identified; A (TETs), B (benign thymic disease or normal pathology). A subgroup of patients with MG and their medical management following thymectomy was also assessed.

Results:

There was no difference in the preoperative haemoglobin, albumin, PLR and NLR between Group A and B ($p > 0.05$). In the subgroup MG, there was no difference in the pre-operative NLR or PLR between patients who did and those who did not have a reduction in medication post thymectomy. The subgroup of patients who did not respond to thymectomy showed a lower LC; this value approached statistical significance (Table 1).

Table 1

	MG Responders n=19	MG Non-responders n=9	P value (T-test)
Lymphocytes	2.69	1.44	0.08
NLR	4.57	7.65	0.1657
PLR	173.05	248.49	0.2418

Conclusions:

The pre-operative lymphocyte count was lower in the sub-group of patients with MG who did not have a clinical improvement after thymectomy. This preliminary finding suggests there may be a lymphocyte mediated immunologic process in MG and could influence the response following surgery. Further studies are warranted in order to make definitive conclusions.

Disclosure: No significant relationships.



F-094

CLINICAL PREDICTORS OF EARLY MORTALITY FOLLOWING NEOADJUVANT THERAPY AND ESOPHAGECTOMY

Brendon Stiles, A. Nasar, G. Salzler, S. Paul, P. Lee, J. Port, N. Altorki

Cardiothoracic Surgery, Weill Cornell Medical College, New York, United States of America

Objectives:

Although esophagectomy can be curative for patients with esophageal cancer (EC), it may be associated with high morbidity and decreased quality of life. Identifying risk factors for early systemic progression or death after esophagectomy may help to guide treatment choices in at-risk patients.

Methods:

Patients undergoing esophagectomy following neoadjuvant therapy for EC (11/87-1/13) were reviewed, excluding incomplete resections and deaths ≤ 3 months. Univariate predictors of death ≤ 1 year of operation were explored by logistic regression. Significant predictors ($p \leq 0.1$) were included in a multivariate model. A risk factor index was created based upon number of significant risk factors in individual patients.

Results:

Of 551 patients, 238 had neoadjuvant chemo or chemo/RT followed by esophagectomy (median age=64, adenocarcinoma=73%, male=79%). Of these, 14% died ≤ 1 year following esophagectomy, 79% with cancer recurrence. Clinical predictors of death ≤ 1 year by univariate analysis included performance status >0 (OR 2.4; CI 0.97-5.94), poor tumor differentiation (OR 3.44; CI 1.28-9.24), and lack of clinical response (no response/progression vs. complete/partial response) to neoadjuvant therapy (OR 3.04; CI 1.24-7.47). For patients with all factors evaluable ($n=167$), variables were summed to derive a cumulative risk factor index, 0-3. An increased risk factor index (≥ 2) was highly associated with increased risk of death ≤ 1 year postoperatively (Table, OR 4.84; CI 1.93-12.16), as well as with poor overall survival. On multivariate analysis, poor differentiation (OR 3.18; CI 1.16-8.71, $p=0.025$) and lack of clinical response to induction therapy (OR 2.73; CI 1.08-6.92, $p=0.034$) were most predictive of early death.

Conclusions:

Clinically-defined risk factors predicting early mortality following esophagectomy for EC include performance status, poor tumor differentiation, and advanced clinical stage. In patients with at least two of these risk factors, 29% die within one year of surgery. These patients should be identified and individual consideration given to less morbid surgical strategies or alternative treatments.

Disclosure: No significant relationships.

F-095

DOES HOSPITAL VOLUME AFFECT LONG-TERM SURVIVAL IN ESOPHAGEAL CANCER PATIENTS? A POPULATION-BASED STUDY IN TAIWANPo Kuei Hsu¹, H.S. Chen², B.Y. Wang³, C.Y. Liu⁴, C.H. Shih⁵, S.C. Wu², C.C. Liu⁵¹*Surgery, Taipei Veterans General Hospital, Taipei, Taiwan*²*Institute of Health and Welfare Policy, National Yang-Ming University, Taipei, Taiwan*³*Surgery, Changhua Christian Hospital, Taichung, Taiwan*⁴*Surgery, Far Eastern Memorial Hospital, New Taipei City, Taiwan*⁵*Surgery, Koo Foundation Sun Yat-Sen Cancer Center, Taipei, Taiwan***Objectives:**

Evidence has shown that high volume hospital is associated with improved postoperative mortality rate. However, controversy exists regarding the impact of hospital volume on long-term survival. We aim to evaluate whether hospital volume affect long-term patient survival in esophageal cancer patients.

Methods:

6106 patients diagnosed as esophageal cancer between 2008 and 2011 were identified from a national population-based cancer registration database (Health Promotion Administration, Ministry of Health and Welfare). Analyses were stratified by treatment modality (Group 1: primary esophagectomy; Group 2: neoadjuvant chemoradiation followed by esophagectomy; Group 3: definitive chemoradiation). Hospital volume thresholds were determined by dividing patients into two approximately equal-sized groups based on the median surgical volume (21 cases per year) in group 1 and 2 or median total case volume (56 cases per year) in group 3. Cox regression analyses were used to study the volume-outcome relationship.

Results:

There were 1301, 850, and 3955 patients in group 1, 2, and 3, respectively. In group 1, the 1- and 3- year overall survival rates at high volume hospital were significantly higher (78.1% and 50.0%) compared to those at low volume hospital (67.9% and 38.8%, $p < 0.001$). Hospital volume (HR = 1.37, 95% CI: 1.09-1.73, $p = 0.007$), cT, pT, pN stages and margin status were significant prognostic factors in the multivariate analysis. On the contrary, no significant association between hospital volume and survival was noted in group 2 and 3. The TNM stages and margin status (in group 2) were significant prognostic factors in group 2 and 3.

Conclusions:

The significant relationship between hospital volume and long-term survival in patients receiving primary resection supports the idea “practice-makes-perfect”, i.e. better surgical techniques lead to better outcome. For patients receiving neoadjuvant chemoradiation first or definitive chemoradiation, tumor biology has a greater effect on the survival than hospital volume.

Disclosure: No significant relationships.

F-096

THE IMPACT OF VENTILATION STRATEGIES DURING THORACOSCOPIC MINIMALLY INVASIVE ESOPHAGECTOMY ON THE POSTOPERATIVE PULMONARY COMPLICATION: TWO-LUNG VERSUS ONE-LUNG VENTILATION

Hao Wang¹, Y. Shen¹, F. Fang², M. Feng¹, W. Jiang¹, J. Cang², L. Tan¹, Q. Wang¹

¹Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China

²Department of Anesthesia, Zhongshan Hospital, Fudan University, Shanghai, China

Objectives:

Pulmonary complication (PC) remains common morbidity after thoracoscopic minimally invasive esophagectomy (MIE), partially due to the lung injury caused by one-lung ventilation (OLV). We attempted two-lung ventilation (TLV) with low tidal volume in semi-prone position assisted by artificial CO₂ pneumothorax. This study aimed to compare the impact of two ventilation strategies on the postoperative PC.

Methods:

From March 2011 to August 2013, 200 patients underwent thoracoscopic MIE. The initial 100 patients performed with OLV (succeeded in 99, with 1 case conversion), and the later half performed with TLV (succeeded in 99, with 1 case conversion). During thoracic stage, patients in OLV group were intubated with double-lumen endotracheal tube and given 8ml/kg tidal volume; while in TLV group, patients were intubated with single-lumen endotracheal tube and also given 8ml/kg tidal volume. An artificial CO₂ pneumothorax was achieved at pressure of 8mmHg. Meanwhile, a pre-placed bronchial blocker was used in case of conversion to thoracotomy. During the abdominal and cervical stage, all patients performed two-lung ventilation. Patients' demographics and clinical outcomes were recorded and statistically compared.

Results:

No significant difference was observed between the two groups in demographics, blood loss, lymph nodes harvested, postoperative hospital stay, total complications or 30-day mortality. The thoracic operative time was longer in TLV group than in OLV (85.4±13.4min vs 74.8±11.2 min, p=0.000). The occurrence of PC in TLV group was lower (9.1% vs. 20.2%, p=0.027). Reintubation for ARDS/ALI was given in 12 patients (3 in TLV and 9 in OLV). The oxygenation index was significantly higher in TLV group than OLV group on POD1 (319.2±31.3 vs. 298.2±29.9, p=0.000) and POD2 (330.8±33.3 vs. 318.0±32.4, p=0.006).

Conclusions:

Two-lung ventilation with low tidal volume during MIE in semi-prone position appears to be feasible, safe and effective. It may attenuate postoperative pulmonary complication. Additional RCT studies are required to confirm this conclusion.

Disclosure: No significant relationships.

F-097

ELIMINATING THE CERVICAL ANASTOMOTIC LEAK WHILE REDUCING COSTS AND IMPROVING OUTCOMES

T. Gunn, J. Speicher, N. Rossi, K. McLaughlin, Mark Iannettoni
Cardiothoracic Surgery, University of Iowa, Iowa City, United States of America

Objectives:

The esophageal anastomotic leak (EAL) results in long-term strictures and chronic dysphagia in over 1/3 of patients with an EAL. EAL is as high as 30% following neoadjuvent therapy (NAT). A change in postoperative care has dramatically reduced the rate of EAL.

Methods:

A prospective change related to oral intake was applied to all patients undergoing trans-hiatal esophagectomy (THE) for any reason. Historically oral intake after THE was resumed on POD 3 at our institution. Because of this relatively high rate of EAL following NAT, no patient was allowed to resume oral intake until POD 15. Patients were discharged on POD 5 with only j-tube feedings until POD 15.

Results:

129 patients underwent THE from 6/2008-11/2013. 5 EALs (3.9%) occurred, which was much lower than our EAL rate of 15% prior to 2008. Of these 5 EALs 1 had a residual tumor at the anastomosis, and 1 had a stent in place prior to NAT crossing the gastroesophageal junction with severe gastric damage upon removal at surgery. In those without a stent at the time of surgery or residual tumor at the anastomosis our leak rate was 2.3% (n=3) of which all three had NAT. Dysphagia requiring dilatation was seen in 12.4% compared to 28% of our control group prior to 2008. This reduction in EAL has resulted in a reduction in cost (table 1) as well as a return to normal activity sooner. The cost reduction due to the need for serial dilations was \$3,233 per patient.

Table 1: Financial benefit of further delayed oral intake after esophagectomy

	Date	Oral intake resumed (POD)	Rate (%)	Average cost per case (\$)	Cost benefit per case (\$)
Anastomotic leak	2/2004-3/2008 (n=101)	3	15	2370	
	6/2008-11/2013 (n=129)	15	3.9	616	1754
Esophageal stricture	2/2004-3/2008	3	28	2655	
	6/2008-11/2013	15	12.4	1176	1479



Conclusions:

By increasing the time to postoperative oral feeding, we have been able to markedly improve on both the immediate and long term outcomes of THE patients. Almost eliminating the EAL has resulted in significantly better long-term results with respect to swallowing, stricture formation, and reduction in the need for serial dilations.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014**14:00 - 15:30****SESSION XIV: AIRWAY/TRANSPLANTATION****O-098****THERMOGRAPHICAL DETECTION OF REGIONAL MALPERFUSION IN EX-VIVO LUNG PERFUSION**

Hideki Motoyama, F. Chen, K. Hijiya, T. Kondo, K. Ohata, M. Takahashi, T. Yamada, M. Sato, A. Aoyama, H. Date
Thoracic Surgery, Kyoto University, Kyoto, Japan

Objectives:

Although ex vivo lung perfusion (EVLP) has been clinically applied as a novel rig to evaluate marginal donor lungs, no parameters have been reported to detect regional lung damage objectively in EVLP. The aim of this study was to investigate whether regional donor lung malperfusion-related damage caused by thrombus could be detected by thermography during EVLP.

Methods:

Lewis Rats were divided into two groups: the thrombosis group [Th(+)] and the non-thrombosis [Th(-)] group (n = 6, each). All rats were heparinized and the lungs were flushed with 20 ml of cold Steen solution. In the Th(+) group, 30 mg of an artificial thrombus was inserted into left main pulmonary artery. All the lungs were perfused and ventilated in the EVLP system. Perfusion flow was increased every 2 min up to 10 ml/min. The lungs were evaluated with thermographical and physiological data during EVLP.

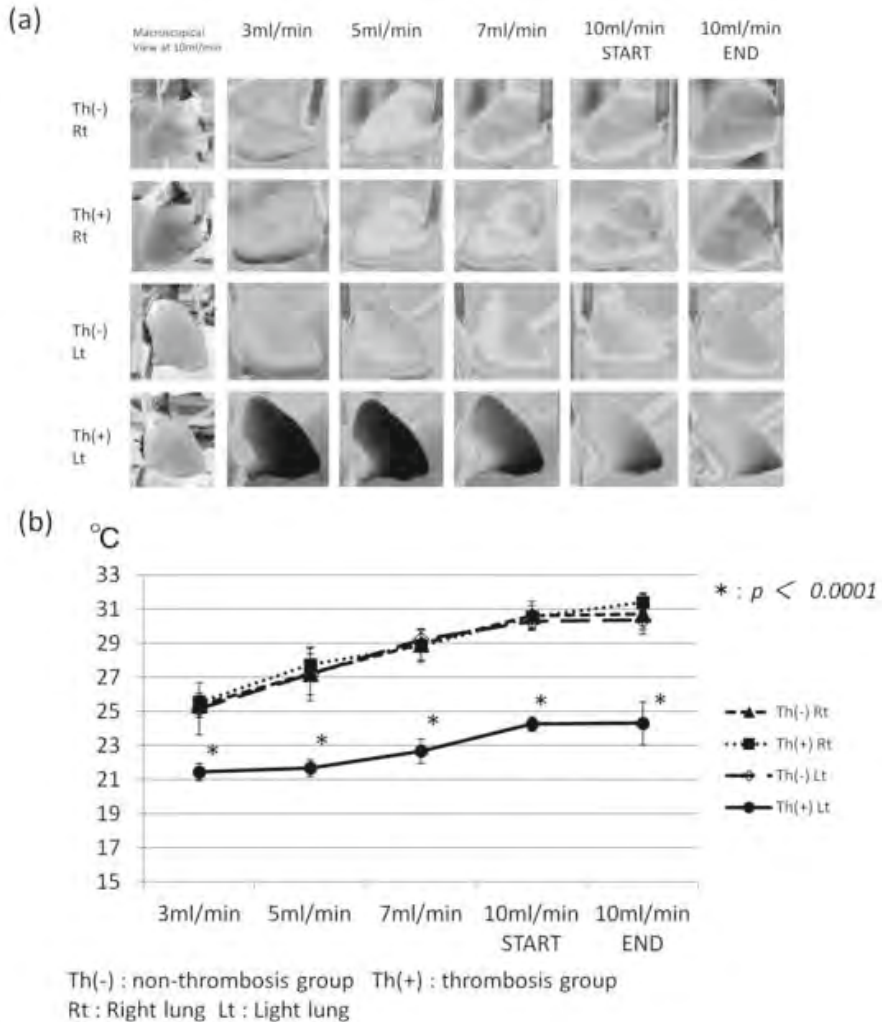
Results:

Pulmonary artery pressure was higher and lung compliance was lower in the Th(+) group than those of the Th(-) group ($p = 0.0005$ and $p < 0.0001$, respectively). Macroscopically, no differences were seen between the perfused area and the malperfused area, while significant differences were detected between them by thermography. Surface temperature of both lungs in the Th(-) group and the right lungs in the Th(+) group rose with increasing perfusion flow, while that of the left lung in the Th(+) group did not rise ($p < 0.0001$, Figure 1).

Conclusions:

Although physiological data could imply a possibility of the existence of thrombus in the thrombosis group, it could not reveal which area was obstructed by thrombi; however, thermography could detect a malperfused region. Thermographical evaluation might become a promising strategy to detect the regional damage of donor lungs and its reconditioning during EVLP.

Figure 1 Temperature change on lung surface



Disclosure: No significant relationships.

O-099

CANCER-ANTIGEN 125 IS ASSOCIATED WITH GRAFT DYSFUNCTION AFTER LUNG TRANSPLANTATIONMohamed Salama¹, P. Jaksch², S. Taghavi², W. Klepetko²¹*Thoracic Surgery, Otto-Wagner Hospital, Vienna, Austria*²*Thoracic Surgery, Medical University of Vienna, Vienna, Austria***Objectives:**

Bronchiolitis obliterans syndrome (BOS) remains the most common complication after lung transplantation (LTX). There is no known efficient treatment for BOS and it is the main cause of death after LTX. Primary graft dysfunction (PGD) is an early ischemia/reperfusion injury of the allograft and is considered as the main risk factor for BOS. The Diagnosis of BOS PGD is difficult as most of the diagnostic procedures are invasive and not specific. That's why the diagnosis can be made only in the later, more severe stages of the diseases. A biomarker that can detect the early signs of BOS is urgently needed. CA125 is a tumor marker used in the diagnosis of ovarian cancer. CA125 can be also elevated in other malignancies, pregnancy and in inflammation of peritoneum, pericardium or pleura. Whether CA125 is associated with outcome of lung transplantation remains unknown.

Methods:

In the current study, CA125 concentration was measured by ELISA in serum of 100 patients that underwent LTX and it was significantly elevated compared to the normal population. PGD and BOS grades were diagnosed and scored according to ISHLT guidelines.

Results:

serum CA125 concentrations were significantly higher in lung recipient ($p=0.020$) as compared to healthy individuals. Pre-transplant serum CA125 levels were higher in patients who developed BOS later ($p=0.03$). Moreover, pre-transplantation CA125 levels were elevated in patients who developed PGD ($p=0.01$).

Conclusions:

In conclusion, the current study revealed a significant elevation of CA125 among lung recipient and suggested that CA125 might contribute to BOS pathogenesis. Moreover, pre-transplant CA125 might be a useful biomarker for early predication and monitoring of BOS.

Disclosure: No significant relationships.

O-100

ANTI-HLA AND MICA-ANTIBODIES ARE RELATED TO ALLOGRAFT DYSFUNCTION IN LUNG TRANSPLANTATION

Teresa Kauke¹, N. Kneidinger², C. Neurohr², R. Hatz¹, H. Winter¹

¹Department of Thoracic Surgery, University Clinic of Munich, Munich, Germany

²Pulmonology, Med V, University Clinic of Munich, Munich, Germany

Objectives:

Recent studies demonstrated that anti-HLA antibodies can predict chronic allograft dysfunction after lung transplantation. Nevertheless not all patients with graft dysfunction develop anti-HLA antibodies indicating that other antigens may be involved. Antibodies against major histocompatibility complex (MHC) class I-related chain A (MICA) have been also detected in patients following lung transplantation. The aim of our study was to investigate the clinical relevance of pre- and post lung transplant appearance of anti-HLA- and MICA antibodies as a marker for chronic graft dysfunction.

Methods:

We examined prospectively pre- and post transplant sera from 40 lung transplant recipients. Mean follow-up after transplantation was 12 months. Donor and recipients were both typed for HLA- and MICA- antigens. The sera were screened by Luminex[®] for HLA- and MICA-antibodies. Positive tested samples were confirmed using a Luminex[®] single antigen bead assay. Outcome was evaluated by short-term survival and the development of bronchiolitis obliterans syndrome (BOS) determined by lung function test and transbronchial biopsies.

Results:

No HLA-and MICA-antibodies were found prior to and after lung transplantation in 13 patients out of 40 (32.5%). HLA- and MICA-antibodies were found in 7 patients out of 40 (18.9%) following transplantation. 4 patients (10.8%) were positive for both HLA- and MICA- ab. The incidence of de novo antibody formation was 12%. We found de novo donor specific antibodies (DSA) against HLA as well as MICA in 8% of the patients. The prevalence of BOS was 12.5% (n=5) in the first year. In 60% of the patients who developed BOS DSA could be detected as opposed to only 16% in the group of patients without DSA (p=0.012).

Conclusions:

The results indicate that anti-HLA- and MICA antibodies may be related to the development of BOS after lung transplantation. Antibody monitoring following lung transplantation could help to identify patients with an increased risk for chronic allograft dysfunction.

Disclosure: No significant relationships.

O-101

**SURVEY ON ENDOBRONCHIAL TREATMENT OF EMPHYSEMA.
PRACTICE VARIATIONS AMONGST ESTS MEMBERSHIP**

Vasileios Tentzeris, K. Papagiannopoulos

Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

Objectives:

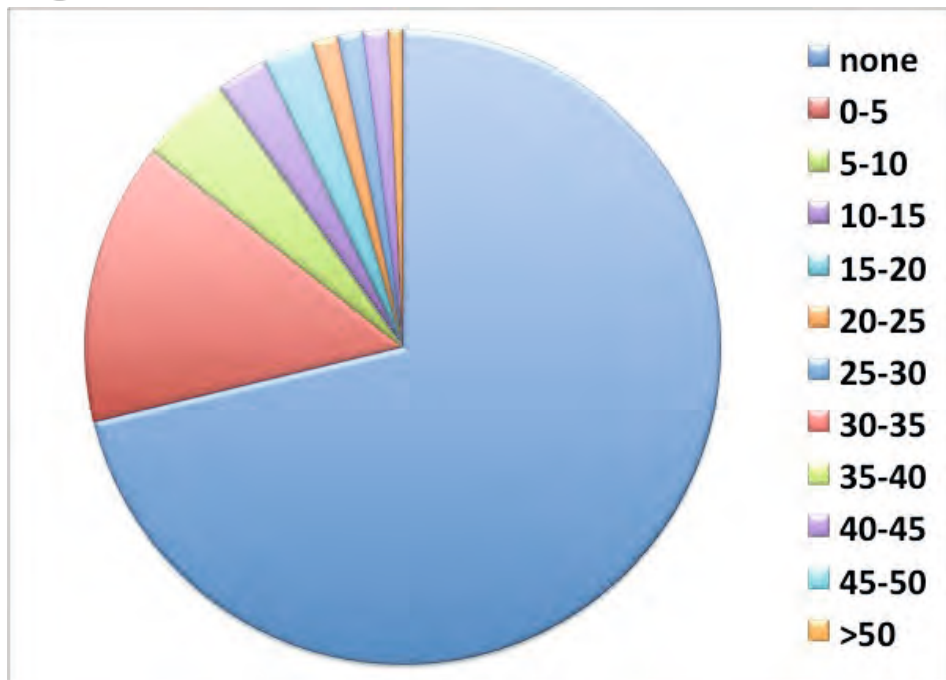
Although the endobronchial management of emphysema has evolved for over a decade we were interested to see whether practice amongst ESTS members follows standard operating procedures.

Methods:

An electronic survey was sent to every ESTS member in 2013. 173 surgeons opted to participate and their replies were analysed.

Results:

Among the participants 60.2% were senior consultant surgeons, 25.7% junior consultant and 14.1% trainees. 59.6% of the Institutions were University State Hospitals. 71.2% of surgeons did not perform endobronchial therapy; 14.4% did less than 5 cases per year and only 4.6% more than 20 cases per year (Figure 1). Implantation of Endobronchial Valves was the commonest practice. The use of thermal vapour ablation, coil implantation and endobronchial blockers was negligible. Although 75% of patients were streamlined by respiratory physicians Institutions with a Multi - Disciplinary Team approach referred by 72.7% to surgeons and 27.3% to physicians. Finally 57.5% were actually performed by surgeons, 25% by physicians and 17.5% by mixed Disciplines. Preoperative and post discharge protocols varied widely with no standard protocols. Hospital stay varied between 0 and 3 days with the majority experiencing an overnight stay (57.9%). 25% of Units offered treatment in Homogenous emphysema and only 39.1% of patients were assessed for collateral ventilation with a chartis system. Despite this a small number of patients crossed over to receive LVRS. Success was evaluated mainly by objective assessment and clinical examination with no complex tests performed post operatively.



Conclusions:

Despite good initial results it seems that the endobronchial therapy of emphysema has not popularised enough amongst surgeons. Furthermore there is still a wide variation in practice and interaction with Respiratory services. The role of the respiratory physician both in referral and follow up remains dominant. A global standardised approach might attract more Units to offer this technique in patients with limited treatment options.

Disclosure: No significant relationships.

O-102

DONOR-TO-HOST TRANSMISSION OF INFECTION IN LUNG TRANSPLANTATION

Alberto Jauregui, I. Lopez, J. Sole, M. Deu, L. Romero, J. Perez, I. Bello, M. Canela
Thoracic Surgery, Vall d'Hebron Hospital, Barcelona, Spain

Objectives:

The purpose of the study was to evaluate the impact of donor infection and the outcome of lung transplant recipients.

Methods:

We performed a retrospective study of 109 consecutive adult lung transplants between January 2011 and December 2012. Donor-to-host transmission of infection was defined as any infection in the recipient due to at least one microorganism also isolated from the donor, considered the same when the antimicrobial susceptibility patterns were identical.

Results:

Donors were 52 % female (mean age of 51 years). Mean ICU stay of 2.4 (r: 0.5 – 15) days with a mean pO₂ of 461 (r: 322 – 636) mmHg. Almost 40 % of the donors were active smokers at the moment of the offer. Types of donor infection included graft respiratory colonization (n = 66), contamination of preservation fluids (n = 42) and bacteraemia (n = 6). Donors older than 60 years and donors with history of tobacco abuse were related to have more graft respiratory colonization (75 % vs. 54.2%, p = 0.036 and 74.4 % vs. 52.3%, p = 0.021 respectively). Peri-operative mortality was higher in recipients with positive graft colonization (10.6% vs. 0%, p = 0.029). A positive graft respiratory colonization was related to a significant increase in death during hospitalization (15.2 % vs. 2.4 %, p = 0.032). Donor-to-host transmission of infection occurred in 9 (8.2%) lung allograft recipients. Among these cases only one patient died because of the infection at 30 days after the surgery (pneumonia due to *Staphylococcus aureus*).

Conclusions:

Even though the rate of transmission of the infection is low, the presence of a positive graft respiratory colonization in lung donors was found to have a poor outcome. Older donors and tobacco abuse was also found to play an important role in respiratory tract colonization.

Disclosure: No significant relationships.



O-103

BRONCHIOLITIS OBLITERANS SYNDROME IN LIVING-DONOR LOBAR LUNG TRANSPLANTATION

Ei Miyamoto, F. Chen, T. Yamada, M. Sato, A. Aoyama, H. Date

*Thoracic Surgery, Kyoto University Hospital, Kyoto, Japan***Objectives:**

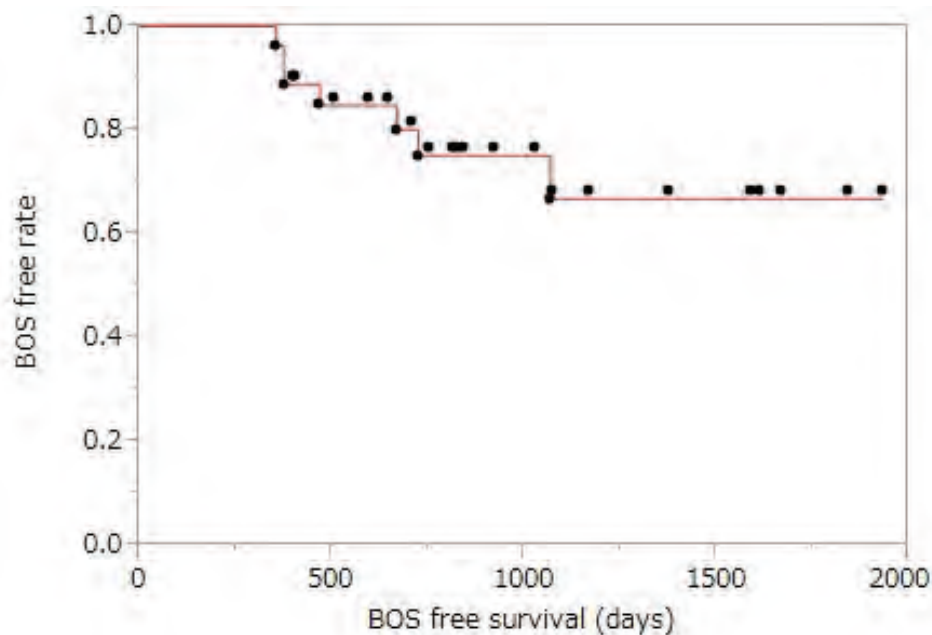
Bronchiolitis obliterans syndrome (BOS) is the main cause of late morbidity and mortality in lung transplantation and defined as the presence of a persistent fall in forced expiratory volume in 1 second associated with an obstructive ventilator defect. However, few studies have been reported concerning BOS after living-donor lobar lung transplantation (LDLLT). The aim of this study was to determine the prevalence and outcome of BOS in LDLLT.

Methods:

Clinical records, pulmonary function data and radiologic findings of 42 patients who underwent LDLLT at our institution between June 2008 and December 2013 were examined. Computed tomography, pulmonary function test and ventilation-perfusion scan were performed prospectively at 3, 6 and 12 months after LDLLT and annually from then on.

Results:

There were 18 males and 24 females with the median age of 44 years (6-64). Single LDLLT was performed in 8 patients, while bilateral LDLLT was conducted in 34 patients. The median follow-up period was 24 months (1-70). Conditions leading to lung transplantation were mainly idiopathic interstitial pneumonia (35.6%) and bronchiolitis obliterans after hematopoietic stem cell transplantation (31.1%). Seven patients were diagnosed with BOS (six patients in BOS stage 1 and one in potential BOS stage) based on the decrease of forced expiratory volume in 1 second. The patients showed air trapping in ventilation-perfusion scan. In these patients, azithromycin was effective to improve or hold forced expiratory volume in 1 second. 5-year BOS free rate was 66.8%. 5-year overall survival was 80.0%.

**Conclusions:**

BOS was confirmed in seven LDLLT patients (16.7%) with good response to azithromycin. Ventilation-perfusion scan might be useful for the diagnosis of BOS after LDLLT.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014

15:30 - 17:30

SESSION XV: CHEST WALL/DIAPHRAGM/PLEURA

O-104

DOES THE TIMING OF CHEMOTHERAPY AFFECT OUTCOME FOLLOWING RADICAL SURGERY FOR MALIGNANT PLEURAL MESOTHELIOMA?

Annabel Jane Sharkey¹, D. Fennell², A. Nakas¹, K.J. O'Byrne³, D. Waller¹

¹Thoracic Surgery, Glenfield Hospital, Leicester, United Kingdom

²Medical Oncology, University of Leicester, Leicester, United Kingdom

³Medical Oncology, Queensland University of Technology, Brisbane, Australia

Objectives:

There is little evidence regarding the use of chemotherapy as part of treatment of malignant pleural mesothelioma (MPM). Apparent survival benefit with adjuvant chemotherapy may be due to selection bias. We aimed to determine whether, in patients fit for chemotherapy, a delay in treatment affected survival.

Methods:

We analysed postoperative variables of 250 patients undergoing either extrapleural pneumonectomy (EPP) or extended pleurectomy-decortication (EPD) for MPM from a prospective database at a single centre. There was no standard protocol for additional chemotherapy: the rationale for giving or withholding chemotherapy in the neo-adjuvant and adjuvant settings was dependent on individual oncological preference and varied with referral centre.

Results:

	n	Median survival (months)	p	n	Time to recurrence (months)	p
Adjuvant	93	19.7	0.721	56	11.9	0.841
Neo-adjuvant	21	20.5		14	10.1	
Delayed – fit	45	16.9		30	8.9	
Unfit for chemotherapy	33	7.7	<0.001	18	7.6	0.720

Of the 249 patients, 57 were excluded from further analysis: 33 died before oncological assessment, 23 progressed before adjuvant therapy was discussed or commenced, and 1 patient only had radiotherapy. Of the remaining 192 patients: 166 (86.5%) were male, median age 59 years(range 14-78). 119 patients (62.5%) had EPD. The majority of patients had epithelioid histology (77.2%) and IMIG stage III disease (56.5%). 100 patients (51.8%) had pathological nodal disease (N1 or N2). Outcome was compared between 4 groups: neo-adjuvant therapy, true adjuvant therapy, delayed chemotherapy reserved for recurrence in those otherwise fit, and those unfit for chemotherapy. Overall there was no effect of the timing of chemotherapy

on survival, but in lymph node positive patients, progression free survival was significantly increased if chemotherapy was not delayed until progression (4.8 vs 10.3 months HR 2.877 95%CI 1.240–6.677, $p=0.01$). Similarly in those with biphasic MPM, delaying chemotherapy until progression significantly reduced overall survival (4.9 vs 15.9 months HR 3.878 95%CI 1.430-10.516 $p = 0.004$).

Conclusions:

Our results suggest that the timing of additional chemotherapy may be important in those with a poorer prognosis on the basis of cell type and nodal stage. In these patients additional postoperative chemotherapy should not be delayed.

Disclosure: No significant relationships.

O-105

AN AGGREGATE SCORE TO PREDICT THE RISK OF LARGE PLEURAL EFFUSION AFTER PULMONARY LOBECTOMY

Ralitsa Hristova¹, C. Pompili¹, S. Begum¹, M. Salati², E. Kefaloyannis¹, V. Tentzeris¹, K. Papagiannopoulos¹, A. Brunelli¹

¹Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

²Thoracic Surgery, Ospedali Riuniti Ancona, Ancona, Italy

Objectives:

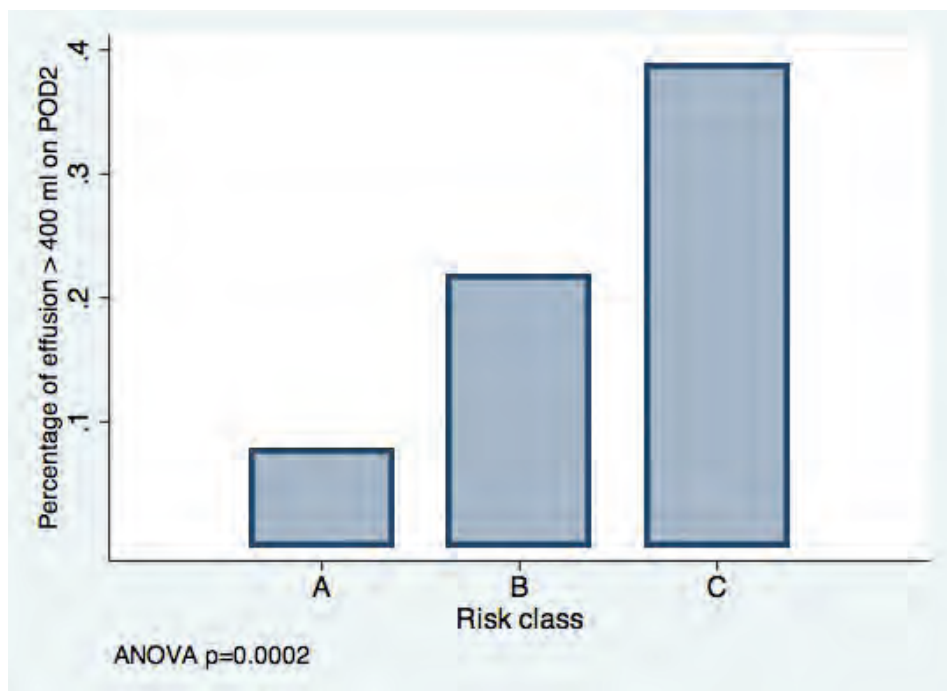
The volume of pleural effusion is one of the determinants of chest drain removal following pulmonary resection. Recent research suggests that values up to 400ml/day are safe. The objective of this study was to develop an aggregate risk score to identify patients at higher risk of developing a large pleural effusion (>400 ml/day) on post-operative day 2 (POD2) after pulmonary lobectomy.

Methods:

An observational study on 229 consecutive patients was conducted prospectively in two European centres (2012-2013). All patients underwent pulmonary lobectomy for lung cancer (thoracotomy: 131, VATS: 98) and managed by single chest tube connected to an electronic regulated suction device. Exclusion criteria were chest wall or diaphragm resection and postoperative assisted mechanical ventilation. To build the aggregate score to variables were initially screened by univariable analysis and then used in stepwise logistic regression analysis (validated by bootstrap). The scoring system was developed by proportional weighing of the significant predictor estimates and patients were grouped in classes of incremental risk according to their total score.

Results:

The incidence of a large pleural effusion (LPE) on POD2 was 23% (53 of 229 patients). The independent risk factors associated with LPE on POD2 were age greater than 70 years ($p=0.01$, bootstrap frequency 71%), a lower lobectomy ($p=0.03$, bootstrap frequency 59%) and presence of COPD ($p=0.02$, bootstrap frequency 63%). Each predictor received a weighted score of 1 and patients were grouped into 3 risk classes showing an incremental risk of LPE (ANOVA, $p=0.0002$): Class A (score 0) 5 of 66, 7.5%; class B (score 1) 19 of 88, 22%; class C (score >1) 29 of 75, 39% (figure 1).

**Conclusions:**

The aggregate score is a reliable tool for identifying high-risk patients for LPE and assists in the selection of patients that can safely proceed to chest drain removal early after surgery.

Disclosure: No significant relationships.

O-106

ULTRASONIC DEFORMATION ANALYSIS AS A NON-INVASIVE DIAGNOSTIC TOOL FOR THE DETERMINATION OF VENTILATOR-ASSOCIATED DIAPHRAGMATIC WORKLOAD

Jan Spillner¹, S. Kalverkamp¹, C. Brülls², R. Autschbach¹, N. Hatam¹

¹Clinic for Thoracic and Cardiovascular Surgery; RWTH Aachen University; Aachen, Germany

²Clinic for Anesthesiology; RWTH Aachen University; Aachen, Germany

Objectives:

Pressure support ventilation modes such as continuous positive airway pressure (CPAP) with assisted spontaneous breathing (ASB) are commonly used for postoperative weaning from respirator therapy. Its intention is a gradual reloading of the diaphragmatic muscle. So far, there is no diagnostic tool available to quantify diaphragmatic function.

Methods:

Following ethical approval and informed consent, healthy probands were ventilated in CPAP/ASB mode with an Evita XL respirator (Dräger, Germany). Following baseline measurements, a positive airway pressure of 5 mmHg was applied and ASB gradually increased from 0 to 15 mmHg. Ultrasonic datasets were repeatedly acquired using a 2.5 MHz transducer (M5S on Vivid E9, GE Healthcare, Horton, Norway) from a defined superhepatic diaphragmatic sector.

Results:

Deformation analysis of the diaphragm was feasible. The method was easy to conduct and reproducible findings were acquired. Although a low degree of ASB (5 mmHg) reduced inspirational strain, higher levels produced a significant increase in inspirational muscle deformation. Compared to a baseline longitudinal strain of $-10.9 \pm 6.3\%$, with an ASB of 15 mmHg, longitudinal strain increased to $-31.4 \pm 9.2\%$ ($n=8$, $p=0.001$). Functional thickening and strain rate did not reveal significant differences between groups.

Conclusions:

Ultrasonic deformation analysis provides reproducible data on diaphragmatic function that might prove superior to mere functional thickening. We also found that in the majority of the assessed healthy subjects, ASB increases diaphragmatic work load instead of unloading the muscle. Further studies in intensive care patients will have to analyse the impact of this new diagnostic tool on respirator therapy and weaning.

Disclosure: No significant relationships.

O-107**DYNAMIC COMPRESSION SYSTEM FOR CONSERVATIVE TREATMENT OF PECTUS CARINATUM PATIENTS: PRELIMINARY RESULTS FROM BASEL**

Sergio Sesia, F.M. Haecker

Pediatric Surgery, University Children's Hospital Basel, Basel, Switzerland

Objectives:

Surgery was the treatment of choice for pectus carinatum (PC) over the last 50 years. Since 2001, an external dynamic compression system (DCS) as alternative treatment method shows good to excellent results in nearly 90% of treated patients. Since June 2013, we use the DCS for conservative treatment of PC and report here about our first, preliminary results.

Methods:

The including criteria in this study were: patients with typical chondrogladiolar PC, pressure of initial correction (PIC) < 9 psi (pound per square inch) and rejection of surgical therapy. All patients were evaluated by clinical evaluation, by measuring digitally the pressure of initial correction (PIC) and of treatment (POT) and the time of daily application, the occurrence of complications and by photography during treatment. The follow-up was monthly.

Results:

A total of 13 PC patients were treated with the DCS (5 patients with symmetric PC, 8 patients with asymmetric PC). The mean age was 14.9 years (range, 11.5-17.8). The mean PIC was 4.8 psi (range, 2.5-7.9). The mean daily utilization time was 10 h (range, 3-23). 11 patients demonstrated improvement of the degree of PC under treatment. Two patients are corrected and already in retainer mode. None of the 13 patients abandoned the treatment. Except skin erosion in one patient, no major complications were noted. All patients were satisfied with the preliminary result.

Conclusions:

Our preliminary results using the DCS for conservative treatment of PC are very encouraging. Patients' satisfaction is high as well as the compliance of our adolescent patients. In contrast, the rate of complication is low.

Disclosure: No significant relationships.

O-108

UNIORTAL VERSUS TWO-PORT THORACOSCOPIC TECHNIQUE FOR DIAGNOSIS AND TREATMENT OF MALIGNANT PLEURAL EFFUSION

Domenico Galetta, A. Borri, R. Gasparri, F. Petrella, L. Spaggiari

Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy

Objectives:

Patients with malignant pleural effusion (MPE) underwent VATS to relieve symptoms and obtain diagnosis. We assessed feasibility of single- versus double-port VATS in the diagnosis and treatment of MPE comparing these two methods.

Methods:

Between January 2011 and November 2013, 168 patients (95 females; mean age 59 years) with MPE received uniportal VATS (Group 1, G1, 84 patients) or two-port VATS (Group 2, G2, 84 patients). In G1, one incision (2 cm long) was placed in the chest in the 6th or 7th intercostal space (i.s.). A 5-mm thoracoscope was used, and the target areas were approached along a sagittal plane. In G2, two incisions (1.5 cm long) were placed at 5th and 7th i.s.. All patients received talc poudrage (8 gr) and a single drain was used in G1 and a double drain in G2.

Results:

Histology included breast cancer in 112 patients, NSCLC in 44, renal cancer in 8 and rectal cancer in 4. Neither morbidity nor mortality was observed. There was no difference between G1 and G2 in terms of age, number of biopsies, and target areas for biopsy. There was a significant difference in median chest drain duration (G1, 3.0 days vs G2, 4.8 days, $p=.01$) and hospital stay (G1, 3.5 days vs G2, 5.5 days, $p=.01$). In terms of postoperative pain, G1 had a significant lower median score (3.8 vs 7.3; $p=.006$, Mann-Whitney test). At one-month chest X-ray no statistical differences were observed between G1 and G2 in terms of residual effusion and subjective respiratory relief.

Conclusions:

Uniportal VATS for MPE appears to be safe, effective, and tolerable in treating MPE allowing the relief clinical symptoms in the majority of patients. Postoperative pain and hospital stay is lower than two-port VATS.

Disclosure: No significant relationships.

O-109

DYNAMIC MAGNETIC RESONANCE IMAGING FOR DIAPHRAGM DYSFUNCTION: TECHNIQUE DEVELOPMENT AND INTEREST BEFORE DIAPHRAGMATIC PLICATION

Françoise Le Pimpec Barthes, C. Pricopi, C. Rivera, A. Badia, P. Bagan, A. Hernigou, A. Arame

Thoracic Surgery, Georges Pompidou European Hospital, Paris, France

Objectives:

The complex shape of diaphragm and its three-dimensional movements during respiratory cycles make its morphological analysis difficult by usual radiologic exams. We developed a dynamic Magnetic Resonance Imaging (MRI) technique for patients with symptomatic unilateral hemidiaphragm elevation before diaphragmatic plication. The main goal was to assess its benefit for understanding dysfunction mechanisms and possibly identifying predictive criteria for postoperative improvement.

Methods:

Between 2002 and 2013, 50 patients were referred to our centre for diaphragm eventration or suspected rupture. Among them the last 11 patients were included in this prospective study. Rigorous interviews with self-evaluation of respiratory discomfort were associated with conventional respiratory functional tests. MRI was also done on healthy volunteers for comparison. After diaphragm plication, functional results were evaluated by clinical interviews.

Results:

Seven males and 4 females, mean age 52.5 (26-74), with unilateral hemidiaphragm elevation (left side in 63.6%) were analyzed. All patients had severe respiratory symptoms and 55% had digestive trouble. Mean preoperative vital capacity was 69.4%. Mean functional discomfort by self-evaluation was 7.4 (scale 1 to 10: least to most severe discomfort). A decreasing movement during respiration was observed by MRI on elevated hemidiaphragm (mean 0.9 cm, extremes 0-2) compared to healthy hemidiaphragm (mean 3 cm, extremes 3-5) and to control patients. Paradoxical movement of elevated hemidiaphragm was even observed at the end of inspiration in 54.5% of patients. By dynamic MRI, preserved areas of functional muscles in the elevated hemidiaphragm (n=3) and unknown bilateral abnormality (n=2) were detected. After surgery, respiratory discomfort decreased to 3.3. Two patients did not improve and no criteria on preoperative MRI allowed prediction of result.

Conclusions:

Dynamic MRI of diaphragm is possible in patients with severe diaphragmatic dysfunction though not helpful in prediction of functional result. However it can help identify preserved diaphragmatic areas requiring surgical technique adaptation.

Disclosure: No significant relationships.



O-110

OPEN PECTUS REPAIR UTILIZING ABSORBABLE STERNAL BARSDaniel L Miller, M.S. Sancheti, K.A. Mansour*General Thoracic Surgery, Emory University, Atlanta, United States of America***Objectives:**

Open pectus repair is the preferred approach for correction of pectus defects in adults. In the majority of patients, metal bars are used to solidify the repair and prevent recurrence. Unfortunately, the patient has to undergo a second procedure for bar removal, thus increasing risk for recurrence. Recently, an absorbable bar (BioBridge) was developed for rib fractures. To determine if an absorbable bar is an acceptable alternative for posterior stabilization of the sternum, we introduced it into our practice and this series represents our early results.

Methods:

We reviewed the records of all patients (> 16 years old) who underwent open repair of pectus defects at our institution between January 2010 and December 2013. Our standard repair is a modified Ravitch anatomical repair without posterior sternal support.

Results:

Thirty-five patients underwent open pectus repair. Median age was 27 (range, 16-73); 21 (60%) were men. Eleven patients (31%) had undergone a previous open repair. Median pectus index was 4.8 (range, 3.5 - 1.8); 27 patients (77%) had an asymmetric defect. Twenty-six patients (74%) underwent posterior sternal support with BioBridge absorbable bars. Median hospital stay was 5 days (range, 3 - 6). Complications occurred in 6 patients (17%); three superficial wound infections, two seromas, and one pneumothorax. Median follow-up was 19 months (range, 1 - 36). Three patients (9%) required repair of a rectus muscle hernia and one removal of a bar for an inflammatory reaction. Patient satisfaction was excellent in 92%, good in 6%, and fair in 2%. None of patients have experienced recurrence of their pectus abnormality

Conclusions:

Open pectus repair with an absorbable bar for posterior sternal support provides a safe alternative. Utilization of absorbable BioBridge bars should be used for open pectus repairs, especially reoperations, to prevent early recurrence and to eliminate the need for a second procedure for bar removal.

Disclosure: D.L. Miller: BioBridge bars are approved for rib fracture repair and chest wall defect repair

O-111

MOBILISATION OF GROWTH FACTORS AFTER PLEURODESIS

Aljaž Hojski, A. Crnjac

Thoracic Surgery, University Medical Centre Maribor, Maribor, Slovenia

Objectives:

The purpose of our study was to analyze and compare growth factors (GF) mobilization in the process of chemical and mechanical pleurodesis. GF are secreted by inflammatory cells and are also released from binding sites within the pleural basal membrane. Transforming growth factor (TGF) β 1, vascular endothelial growth factor (VEGF), and fibroblast growth factors (FGF)1 and 2 are the central mediators in the fibrosis process. However, VEGF's vasodilatory effect can also trigger ARDS.

Methods:

A prospective randomized study included 26 female patients with breast carcinoma and malignant pleural effusion. 12 patients were treated by means of mechanical and 14 patients by chemical pleurodesis. Samples of pleural fluid and blood serum were analyzed for growth factors content by ELISA. The results from the two groups were compared using Mann-Whitney test.

Results:

The results of our study are summarized in Table 1. Table 1: Median levels of growth factors in serum and pleural fluid before and after chemical and mechanical pleurodesis and comparison (p) between post pleurodesis levels.

	Median growth factor level before chemical pleurodesis	Median growth factor level before mechanical pleurodesis	Median maximal growth factor level after chemical pleurodesis	Median maximal growth factor level after mechanical pleurodesis	p
serum VEGF	561.08	592.71	930.68	854.00	0.604
serum FGF1	≤31.20	≤31.20	≤31.20	≤31.20	0.961
serum FGF2	≤10.00	≤10.00	≤10.00	11.24	0.093
serum TGFβ1	21386	16365	28359.5	18839	0.720
pleural VEGF	1010.6	1400.0	6335.5	4283.0	0.278
pleural FGFα	127.92	90.75	221.54	326.79	0.720
pleural FGFβ	10.03	≤10.00	49.02	168.39	0.204
pleural TGFβ1	2680	3704	2595.5	4364	0.063

Maximal serum VEGF level after chemical pleurodesis was 11930 pg/ml and 2687 pg/ml after mechanical. Pleural levels of FGF1, 2 and TGFβ1 were higher after performing mechanical pleurodesis compared to those after chemical pleurodesis, nevertheless the difference did not reach statistical significance.

Conclusions:

In some patients chemical pleurodesis led to an enormous increase of VEGF serum level, such significant changes were not observed after mechanical pleurodesis. Mechanical pleurodesis may launch a more favorable ratio of released GF. TGF β1 and, in our experience, also FGF2 remain the most interesting parameter for future research. Considering the mechanisms of growth factors action we conclude that the mechanical pleurodesis is a more efficient and safer method than chemical pleurodesis.

Disclosure: No significant relationships.

TUESDAY, 17 JUNE 2014**16:00 - 17:30****SESSION XVI: MITIG – VATS RESECTIONS****F-112****PERFORMING VATS LOBECTOMIES IN LUNG CANCER PATIENTS REDUCES ONE-YEAR HOSPITAL ADMITTANCE**Lars Konge¹, L.Ø. Laursen¹, H.J. Hansen², T. Jensen³, J. Ravn², R.H. Petersen²¹*Centre for Clinical Education, University of Copenhagen and the Capital Region of Denmark, Copenhagen, Denmark*²*Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark*³*Department of Environmental Medicine, Faculty of Health Sciences, Odense, Denmark***Objectives:**

Performing lobectomies by video-assisted thoracic surgery (VATS) reduces postoperative in-hospital-stay for lung cancer patients compared to standard operations through a thoracotomy. It is unknown if the less invasive approach is also beneficial after the patients have been discharged from the hospital. The aim of this study was to explore hospital admissions in the first year after lobectomy for lung cancer.

Methods:

This regional study included all patients who had a lobectomy due to lung cancer from 2005 to 2011. Demographic patient data and data regarding type of operation, lung function, lung cancer stage, co-morbidity, and in-hospital stay were collected prospectively in a national cancer database. Retrospectively, all patients were looked up in a national database containing complete information about all hospital admissions and in-hospital days were registered. Baseline data were compared using Pearson Chi-square (categorical data) and independent samples t-tests (continuous data) as appropriate. Multiple logistic regression analysis was used to explore predictors for hospital admissions.

Results:

1390 patients were operated in seven years; 789 by VATS and 601 through a thoracotomy. Patients operated by VATS were older ($p<0.001$), had a lower cancer stage ($p<0.001$), and a higher proportion of adenocarcinomas ($p<0.001$) than patients who had a thoracotomy. Gender distribution, lung function and co-morbidity were not significantly different in the two groups. During the first year following initial discharge from the hospital the patients spent 7.4 (SD 13.7) and 10.2 (SD 17.4) days in a hospital for VATS lobectomies and thoracotomies respectively ($p=0.001$). Multiple logistic regression analysis showed that cancer stage and co-morbidity were the best predictors for hospital admissions. However, after adjusting for confounders, VATS patients still had lower odds for hospital re-admission compared to thoracotomy patients (OR=0.80, 95% CI 0.62-1.02).



Conclusions:

VATS lobectomy for lung cancer results in fewer admissions during the first year after the operation.

Disclosure: H.J. Hansen: Dr. Hansen is a speaker for Covidien

R.H. Petersen: Dr. Petersen is a speaker for Covidien

F-113

COMPARISON OF THORACOSCOPIC SEGMENTECTOMY AND THORACOSCOPIC LOBECTOMY IN THE PATIENTS WITH NON-SMALL CELL LUNG CANCER: A PROPENSITY SCORE MATCHING STUDY

YooHwa Hwang, C.H. Kang, S.H. Sohn, H.S. Kim, J.H. Jeon, I.K. Park, Y.T. Kim
Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea

Objectives:

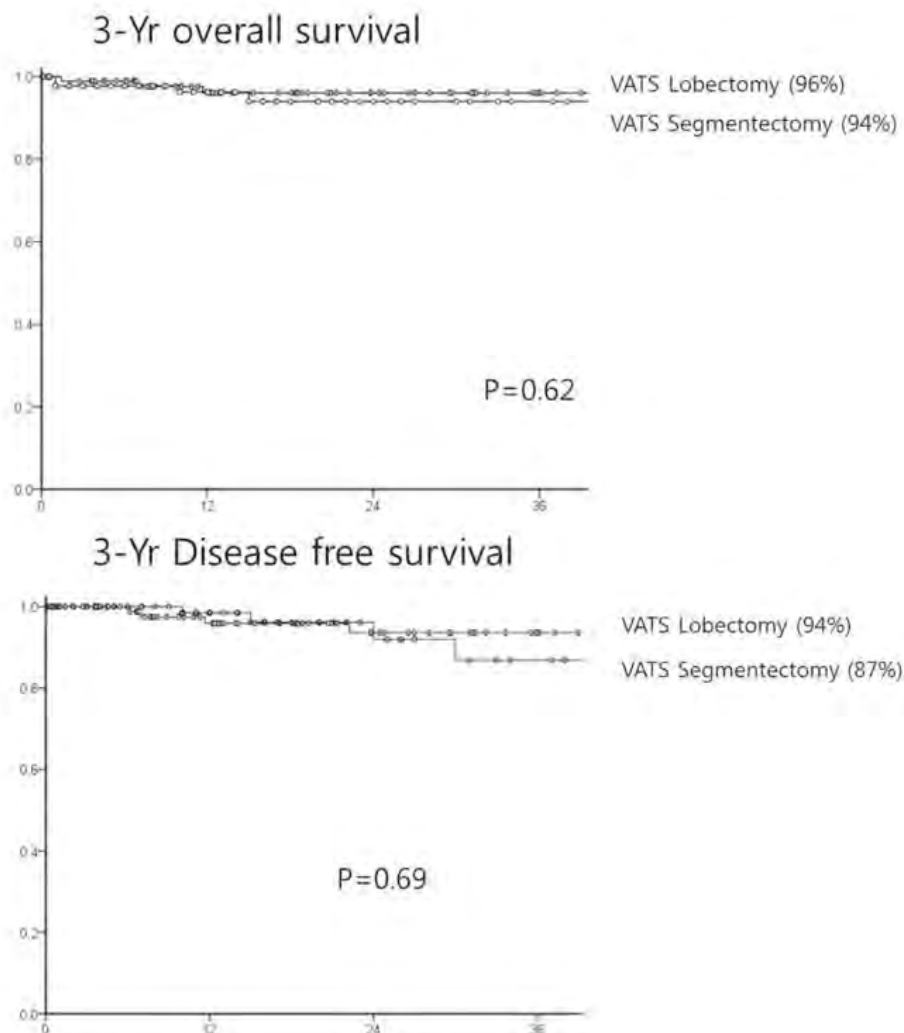
Thoracoscopic lobectomy has been widely performed in the patients with early lung cancer; however indication of thoracoscopic segmentectomy has not been clearly defined due to technical difficulty and unclear oncologic outcomes. The aim of this study was to compare early and late outcomes between thoracoscopic segmentectomy and thoracoscopic lobectomy.

Methods:

Between Jan 2005 and Dec 2013, 100 thoracoscopic segmentectomies and 1049 thoracoscopic lobectomies has been performed in our institute in the patients with lung cancer. Preoperative clinical parameters including gender, age, tumor size, pathologic stage, histology, and forced expiratory volume in 1 second (FEV1) were used for propensity-score matching. After propensity-score matching, 94 thoracoscopic segmentectomies and 94 lobectomies were selected and compared.

Results:

Thoracoscopic segmentectomies were performed in the patients with normal lung function (mean FEV1 = 100.7±17.8%), small-sized tumor (mean diameter 1.7±0.8cm), early stage (stage I 94.5%) and predominant adenocarcinoma (94.7%). Lobectomy group had similar clinical features with those of segmentectomy group. Most commonly performed procedure was left upper lobe bisegmentectomy (32%) and right lower lobe superior segmentectomy (17%). Segmentectomies were performed in all lobes except right middle lobe. There were no difference between segmentectomy and lobectomy in terms of operation time (166.3±54.7 minutes vs. 181.1±85.2 minutes, p=0.47) and hospital stay (6.2±5.2 days vs 7.1±7.1 days, p=0.31). Incidence of postoperative complications was higher in lobectomy (19% vs 11%, p=0.1), and postoperative mortality rates were higher in segmentectomy (1.1% vs. 3.2%, p=0.32). However the difference was statistically not significant. Postoperative decrease of FEV1 was smaller in segmentectomy (8.9±10.8 vs 11.0±13.1, p=0.36) without statistical significance. The 3-year overall survival and recurrence-free survival was not different between two groups (94% and 87% in segmentectomy and 96% and 94% in lobectomy, p=0.62 and p=0.69).



Conclusions:

Thoracoscopic segmentectomy could achieve equal short-term surgical results and long-term oncologic outcomes compared to thoracoscopic lobectomy.

Disclosure: No significant relationships.

F-114

THORACOSCOPIC VERSUS OPEN LOBECTOMY FOR EARLY STAGE NON-SMALL CELL LUNG CANCER: A PROPENSITY-MATCHED ANALYSIS OF OUTCOME FROM THE ESTS DATABASE

Pierre Emmanuel Falcoz¹, M. Puyraveau², P. Thomas³, H. Decaluwe⁴, M. Hürtgen⁵, R.H. Petersen⁶, H.J. Hansen⁶, A. Brunelli⁷

¹*Department of Thoracic Surgery, Strasbourg University Hospital, Strasbourg, France*

²*Clinical Methodology Center, Besancon University Hospital, Besancon, France*

³*Department of Thoracic Surgery, Marseille University Hospital, Marseille, France*

⁴*Campus Gasthuisberg, UZ Leuven, Leuven, Belgium*

⁵*Thoracic Surgery Department, Catholic Clinics Koblenz-Montabaur, Koblenz, Germany*

⁶*Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark*

⁷*Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom*

Objectives:

Video-assisted thoracoscopic anatomic resections are increasingly used in Europe to manage early stage lung cancer. The purpose of this study was to compare the outcome following thoracoscopic versus open lobectomy in case-matched groups of patients from the European Society of Thoracic Surgeons (ESTS) database.

Methods:

All patients having lobectomy as the primary procedure via thoracoscopy (VATS-L) or thoracotomy (TH-L) were identified in the ESTS database (January 2007-May 2013). A propensity score was constructed using several patients' baseline characteristics in order to minimize selection bias. A case-matched analysis was performed to compare the incidence of postoperative major complications (according to the ESTS database definitions) and in-hospital mortality between the matched groups. After exclusions, 25,455 patients were identified: 23,546 having thoracotomy and 1,875 having thoracoscopy. Propensity score yielded two well-matched groups of 1,875 patients. Numeric variables were compared by Student's t-tests and categorical variables were compared by McNemar tests.

Results:

Compared to TH-L, VATS-L was associated with a lower incidence of total major cardiopulmonary complications [n=257 (15.7%) vs. 322 (19.5%), p=0.0009], atelectasis requiring bronchoscopy [n=43 (2.3%) vs. 92 (4.9%), p<0.0001], ARDS [n=12 (0.6%) vs. 29 (1.5%), p=0.0079], initial ventilation > 48h [n=10 (0.5%) vs. 26 (1.4%), p=0.0077], and wound infection [n=6 (0.3%) vs. 16 (0.8%), p=0.033]. There was no difference in incidence of postoperative atrial fibrillation between the 2 groups (p=0.36). Postoperative hospital stay was 2 days shorter in the VATS-L patients (7.8 vs. 9.7 days; p<0.0001). In terms of outcome at hospital discharge, there were 18 deaths in the VATS-L group (1%) versus 44 in the TH-L group (2.4%), p=0.0028.



Conclusions:

Data from the ESTS database confirmed that lobectomy performed through VATS is associated with a lower incidence of complications compared to thoracotomy. At the time of meeting presentation, data will be updated with the 2013 database inclusion.

Disclosure: No significant relationships.

F-115

DOES SINGLE-INCISION THORACOSCOPIC LOBECTOMY FOR LUNG CANCER REDUCE POSTOPERATIVE PAIN?Chao Yu Liu¹, P.K. Hsu², B.Y. Wang³, C.H. Shih⁴, C.C. Liu⁴¹*Surgery, Far Eastern Memorial Hospital, New Taipei City, Taiwan*²*Surgery, Taipei Veterans General Hospital, Taipei, Taiwan*³*Surgery, Changhua Christian Hospital, Taichung, Taiwan*⁴*Surgery, Koo Foundation Sun Yat-Sen Cancer Center, Taipei, Taiwan***Objectives:**

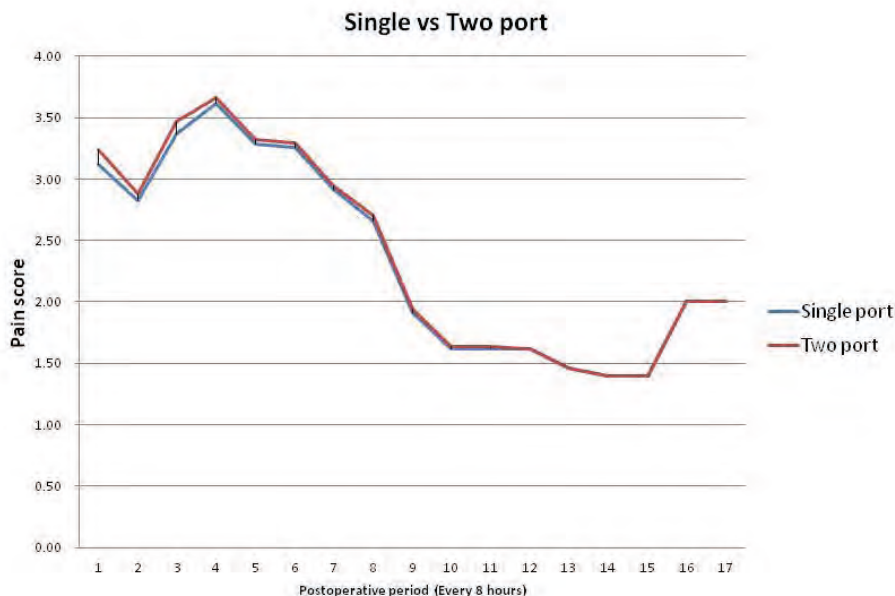
Single-incision thoracoscopic surgery for lung cancer has been proposed as a feasible approach in lung cancer surgery. Reducing postoperative pain is one of the potential benefits in single-incision over conventional two- or three- port incision in thoracoscopic surgery. We aim to compare the level of postoperative pain between patients undergoing single-incision and two-incision thoracoscopic lobectomy for lung cancer in our institute.

Methods:

From November 2011 to June 2013, 50 patients underwent single-incision thoracoscopic pulmonary resection for lung cancer. Among them, 35 patients underwent lobectomy. From January 2005 to June 2013, 195 patients underwent two-incision thoracoscopic pulmonary resection for lung cancer. Among them, 160 patients underwent two-incision thoracoscopic lobectomy. All surgery were done by one thoracic surgeon. A propensity match analysis, incorporating pre-operative variables, was used to compare the single-incision (n=35) and two-incision (n=160) groups. The postoperative pain level between two groups were evaluated by a 0-10 pain scale, spirometer, and the given dosage of analgesic agents.

Results:

Overall, 35 patients undergoing single-incision thoracoscopic lobectomy were matched with 35 undergoing two-incision thoracoscopic lobectomy in our cohort. Shorter operative time (p=0.046) and less blood loss (p=0.023) were seen in the single-incision group. Pain scores and the given analgesic dosage are similar between the two groups postoperatively. However, postoperative spirometer showed better recovery of pulmonary function in postoperative day 1 among patients undergoing single-incision approach (p=0.032).



Conclusions:

Our experience demonstrated that single-incision thoracoscopic lobectomy for lung cancer did not reduce postoperative pain compared with two-incision thoracoscopic surgery. Although postoperative recovery of pulmonary function in postoperative day 1 is better in the patients undergoing single-incision approach, the benefit of reducing postoperative pain attributed to single-incision approach needed to be validated in the future.

Disclosure: No significant relationships.

F-116

VATS VS. OPEN LOBECTOMY FOR STAGE I NSCLC: ANALYSIS OF LONG TERM OUTCOMES AND ONCOLOGIC EQUIVALENCY

H. Zhou, L. Tapias, C. Wright, H. Gaissert, J. Wain, A. Muniappan, C. Morse, D. Donahue, D. Mathisen, Michael Lanuti

Thoracic Surgery, Massachusettes General Hospital, Boston, United States of America

Objectives:

There is recent controversy in the literature regarding nodal upstaging and oncologic equivalency of video assisted (VATS) versus open lobectomy for non-small cell lung cancer (NSCLC). This study seeks to compare nodal sampling and long-term outcomes in VATS versus open lobectomy in patients with stage I NSCLC.

Methods:

724 patients with pathologic stage I NSCLC treated with VATS or open lobectomy were retrospectively reviewed between 2006 and 2012. The total number of resected lymph nodes (RNs), and number of lymph node stations sampled (LNS) were recorded. Primary end-points were tumor recurrence, disease-free survival (DFS) and overall survival (OS). Multivariate analysis incorporated variables of interest to assess the effect of surgical approach on primary end-points.

Results:

VATS lobectomy was employed in 402(55.5%) patients while 322(44.5%) underwent open lobectomy. Baseline characteristics were similar between groups; however, mean tumor size was larger in the open group (2.5 ± 1.2 cm versus 2.3 ± 1.1 cm in VATS; $p=0.01$). T2aN0 tumors were more commonly observed in the open group versus VATS (40.5% versus 29.6%, $p=0.003$). On pathologic examination, median RNs and LNS was similar (9 [interquartile range: IQR 5-13.5] versus 9 [IQR 6-14], $p=0.67$; and 4 [IQR 3-5] versus 4 [IQR 3-5], $p=0.90$). VATS lobectomy was associated with shorter hospital stay ($p<0.01$) and reduced duration of chest drainage ($p<0.01$). Five-year recurrence rate, DFS and OS in the open group was 21.5%, 73.4% and 62.0% versus 18.8%, 74% and 73% for VATS, respectively. On multivariate analysis time to recurrence was no different between the open and VATS approach ($p=0.63$), but open lobectomy was associated with worse OS (HR: 1.62 [1.15-2.27], $p=0.005$) and DFS (HR 1.43: [1.07-1.90], $p=0.015$). Median follow-up was 3.3 mo. for VATS and 3.9 mo. for open lobectomy.

Conclusions:

VATS lobectomy was associated with better OS and DFS compared with an open technique in pathologic stage I NSCLC. Time to recurrence was comparable between groups suggesting oncologic equivalency between open vs. VATS lobectomy.

Disclosure: No significant relationships.

F-117

POSSIBLE MISINTERPRETATION OF OUTCOMES OF VIDEO-ASSISTED THOROSCOPIC LUNG LOBECTOMY FOR TREATMENT OF EARLY STAGE NON-SMALL CELL LUNG CANCER CAUSED BY CURRENT TNM CLASSIFICATION SYSTEM

Tomohiro Murakawa, J. Ichinose, H. Hino, K. Kitano, C. Konoeda, T. Karasaki, K. Nagayama, J. Nitadori, M. Anraku, J. Nakajima

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

Objectives:

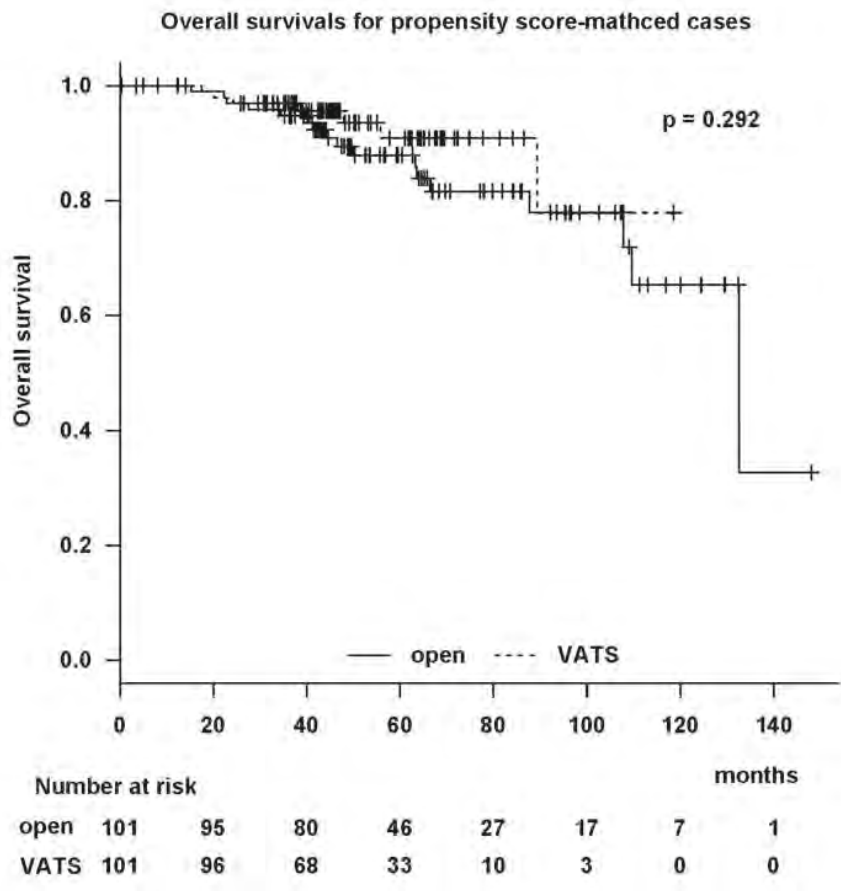
Favourable short- and long-term outcomes for patients that underwent lung lobectomy for early stage non-small cell lung cancer (NSCLC) by video-assisted thoracoscopic surgery (VATS) have been mainly reported in retrospective settings. However, using the current T descriptor, which reflects whole tumour size but does not reflect solid tumour size, the interpretation of those results may be biased. In this study, we conducted a propensity score matching analysis to compare short- and long-term outcomes of patients that underwent VATS or open lobectomy.

Methods:

We retrospectively reviewed patients who underwent lung lobectomy for cT1-2N0M0 NSCLC from 2001 to 2010. We only collected data from patients whose preoperative high-resolution computed tomography results were available. The outcomes of patients that underwent VATS lobectomy were compared to those that underwent open lobectomy before and after performing propensity score matching, which evaluated preoperative variables, including solid tumour size and tumour-disappearance ratio.

Results:

There were 101 VATS patients and 184 open lobectomy patients. Before propensity score matching, the VATS group had a higher mean age ($p < 0.0001$), smaller solid tumour size ($p = 0.0042$), similar whole tumour size ($p = 0.2082$), larger tumour-disappearance ratio ($p = 0.0007$), shorter operation time ($p = 0.0002$), less blood loss ($p < 0.0001$), shorter chest tube duration ($p = 0.0002$), shorter hospital stay ($p < 0.0001$), and better disease-free, disease-specific, and overall survival rates (p -values: 0.0049, 0.0154, 0.032, respectively). After propensity score matching, all differences, except operation time, blood loss, chest tube duration, and hospital stay, were no longer significant (Figure).



Conclusions:
VATS lobectomy is less invasive than open lobectomy, but in terms of survival outcomes, the oncological benefit of VATS may be overestimated under the current TNM classification system.

Disclosure: No significant relationships.

F-118

SAFE INTRODUCTION OF VATS IN THE NETHERLANDS: FIRST RESULTS OF A NATION-WIDE AUDIT

Martijn Ten Berge¹, P.J. Van Huijstee², R. Damhuis³, M. Wouters⁴, W.H. Schreurs⁵

¹*Surgical Oncology, Leiden University Medical Center, Leiden, Netherlands*

²*Surgery, Haga Ziekenhuis, The Hague, Netherlands*

³*Epidemiology, Dutch National Cancer Registry, Utrecht, Netherlands*

⁴*Surgical Oncology, Antoni van Leeuwenhoek Ziekenhuis, Amsterdam, Netherlands*

⁵*Surgery, Medisch Centrum Alkmaar, Alkmaar, Netherlands*

Objectives:

In 2006 video-assisted thoracic surgery (VATS) was introduced for anatomical parenchymal resections (segmentectomy, (bi)lobectomy, pneumonectomy) of non-small cell lung cancer (NSCLC) in the Netherlands. Implementation was realised by the formation of dedicated teams and formulating minimum volume requirements per institution. The main objective of this study was to compare surgical outcome between VATS and thoracotomy.

Methods:

Patients who underwent resection for NSCLC in 2012-2013 were included in a obligatory nation-wide, web-based prospective database, the Dutch Lung Surgery Audit. Patients were stratified in two groups: the thoracotomy versus the VATS group. Patient, tumour and treatment characteristics, as well as outcome, were compared between the two groups using Chi-square tests and multivariate analysis.

Results:

The preliminary results comprise 2.226 patients treated in 42 hospitals with general thoracic surgeons. Patient characteristics were similar for the VATS and thoracotomy group, though more advanced tumour stages were found in the thoracotomy group. Near 60% of lobectomies and a small minority of more extensive parenchymal resections (bilobectomies, pneumonectomies) were performed by VATS. For lobectomies, a similar number of resected N1 and N2 lymph nodes were found in both groups. There was no significant difference in 30-day mortality (VATS: 1.6% vs thoracotomy: 3.1%) or reintervention rate (VATS: 4.1% vs thoracotomy: 5.1%). Pneumothorax and air leakage longer than 5 days were more common in the VATS group, although not associated with a prolonged length of stay (mean: 6 versus 8 days).

Conclusions:

Since its introduction in the Netherlands, the nationwide percentage of resections for NSCLC performed by VATS procedure increased rapidly to become one of the highest in the world. Although variation in patient selection criteria does not allow a direct comparison of long term outcomes between the two techniques, this study suggests that there has been a safe introduction of VATS for the treatment of NSCLC in the Netherlands.

Disclosure: No significant relationships.

Posters**SUNDAY - TUESDAY, 15-17 JUNE 2014****08:30 - 17:30****P-119****DIFFERENT MEASURES TO PREVENT ATRIAL FIBRILLATION IN PATIENTS UNDERGOING PULMONARY RESECTION FOR LUNG CANCER. EVIDENCE FROM A COMPREHENSIVE NETWORK META-ANALYSIS OF RANDOMIZED AND OBSERVATIONAL STUDIES**Mariusz Kowalewski, M.A. Lewandowska, J. Kowalewski*Department of Thoracic Surgery and Tumors, Collegium Medicum, Nicolaus Copernicus University in Torun, Bydgoszcz, Poland***Objectives:**

Atrial fibrillation (AF) after pulmonary resections for lung cancer, although transient in most cases, occurs in up to 30% following lobectomy and up to 65% after pneumonectomy and might, in turn, lead to serious adverse events including stroke, myocardial infarction and death. Different preventive measures have been investigated, however because of paucity of evidence from randomized studies, straightforward recommendations are still uncertain. We aimed to perform a Bayesian-framework mixed treatments comparison (network) meta-analysis of both randomized controlled- (RCTs) and observational studies, to investigate the net-relative benefit of diverse drugs in prevention of atrial fibrillation following pulmonary resections for lung cancer

Methods:

We screened Medline, Google Scholar, EMBASE and Cochrane CENTRAL registries for randomized and observational studies comparing drugs to each other and/or to placebo. Studies with post-operative AF as prespecified end-point were retrieved for detailed abstraction. Primary outcome was assessed at longest available follow-up.

Results:

Overall 15 studies (13 RCTs) were identified, enrolling N=1753 patients. Beta-blockers, Atrial Natriuretic Peptide and Flecainide were associated with significant relative reduction in odds of postoperative AF, OR (2.5-97.5% CrI) of 0.34 (0.02-0.92); 0.35 (0.00-0.94) and 0.11 (0.00-0.46) respectively; Digoxin was found to increase these odds. Addition of observational data allowed for identification of Amiodarone as another potentially preventive treatment OR (2.5-97.5% CrI) 0.28 (0.03-0.69). Bayesian posterior probability curves revealed the ranking among treatments with Flecainide, beta-blockers, ANP and Amiodarone being associated with the highest probability to reduce the odds of AF, magnesium and calcium blockers with virtually no effect and digoxin found inferior to placebo.

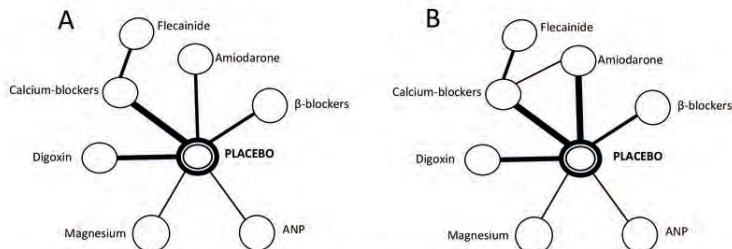
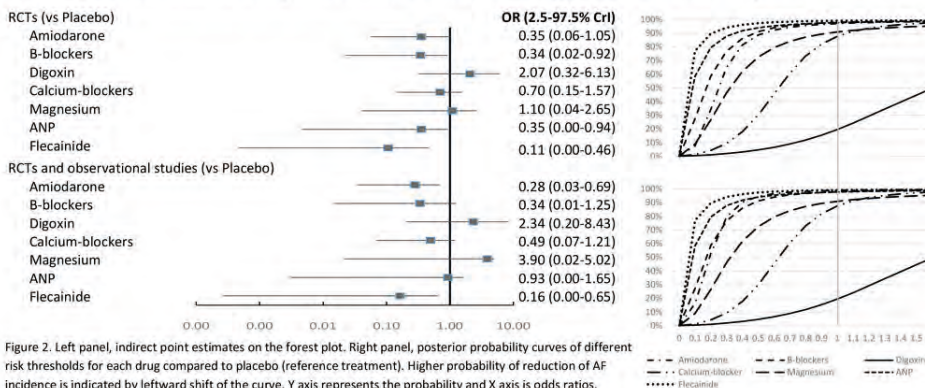


Figure 1. Network diagram of mixed treatment comparisons meta-analysis. A=randomized controlled studies; B=randomized controlled- and observational studies. The circles depict different treatments, the width of the link correspond to the number of available comparisons.



Conclusions:

Beta-blockers and Flecainide are effective in reducing the incidence of postoperative AF in patients after pulmonary resections which is not the case with digoxin; data on remaining treatments are sparse and preclude drawing definite conclusions.

Disclosure: No significant relationships.

P-120

THE EVALUATION OF UTILITY OF PREOPERATIVE SYSTEMATISED PULMONOLOGICAL PHYSIOTHERAPY AMONG NON-SMALL-CELL LUNG CANCER PATIENTS UNDERGOING ANATOMICAL LUNG RESECTION

Anna Jarosz¹, A. Szlubowski², Z. Grochowski³, M. Janczura⁴, M. Ładyńska⁴,
Ł. Pominkiewicz⁴, M. Gnass², A. Ćmiel⁵, J. Soja⁶, J. Kużdżał³

¹*Department of Physiotherapy, Jagiellonian University, Medical College, Faculty of Health Sciences, John Paul II Hospital, Krakow, Poland*

²*Department of Pulmonology, Endoscopy Unit, John Paul II Hospital, Krakow, Poland*

³*Department of Thoracic Surgery, Jagiellonian University, Medical College, Faculty of Health Sciences, John Paul II Hospital, Krakow, Poland*

⁴*Department of Anesthesiology and Pulmonary Intensive Care, Jagiellonian University, Medical College, Faculty of Health Sciences, John Paul II Hospital, Krakow, Poland*

⁵*Department of Applied Mathematics, AGH University of Science and Technology, Krakow, Poland*

⁶*Department of Medicine, Jagiellonian University, Medical College, Krakow, Poland*

Objectives:

To estimate an impact of the 2-weeks intensive preoperative systematised pulmonological physiotherapy (PSPP) conducted in household conditions among non-small-cell lung cancer (NSCLC) patients undergoing anatomical lung resection on respiratory tests, endurance during exercise, time of hospitalization and number of post-operative complications.

Methods:

The study included 100 NSCLC patients who were subjected to prospective controlled randomised clinical trial. Patients from test group (T) were submitted to PSPP, while those from control group (C) were not. Initially patients had performed spirometry, six-minute walk test (6MWT) and evaluation of anxiety. The same tests were repeated a day before operation and in 4-9th and 21-23th day after the operation. Additionally spirometry was performed in 1st and 3rd day after the operation. A level of pain measured by visual analogue scale (VAS) was also assessed in 1st, 3rd, 4-9th and 21-23th day after the operation.

Results:

Groups C and T were similar regarding BMI ($p=0.816$) and age ($p=0.619$). In group T higher FVC and FEV₁ were noticed, but those differences were not statistically significant. In group T 6MWT distance was considerably longer than in group C, especially in 4-9th and 21-23th day after surgery. Similarly, in group T higher post-exercise saturation in 4-9th and 21-23th day after surgery was detected. In group C significantly bigger dyspnoea ($p=0.049$) and weariness ($p<0.001$) after exercise during post-operative period were observed. A test for homogeneity ($p<0.014$) revealed less intensive post-operative pain in 1st and 4-9th day in group T. Additionally, in group T lower frequency of post-operative complications was noticed (twice smaller number of patients required elongated pleural drainage and necessity of using mechanical ventilation during a post-operative cardiovascular and respiratory failure ($p=0.015$)).



Conclusions:

After this study the PSPP improves endurance during exercise, relieves post-operative pain, reduces number of post-operative complications and time of hospitalization.

Disclosure: No significant relationships.

P-121

THE MAXIMUM DIMENSION OF THE INFERIOR VENA CAVA IS A SIGNIFICANT PREDICTOR OF POSTOPERATIVE MORTALITY IN LUNG CANCER PATIENTS WITH COMBINED PULMONARY FIBROSIS AND EMPHYSEMA

Mariko Fukui, K. Suzuki, T. Matsunaga, K. Takamochi, S. Oh

General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

Pulmonary hypertension has been reported to be a poor prognostic factor in patients with combined pulmonary fibrosis and emphysema (CPFE). However, there have been no reports on relationship between right side cardiac pressure and prognosis of resected lung cancer combined with CPFE.

Methods:

This retrospective study was performed on 981 patients who underwent surgical resection of lung cancer at our institute between 2008 and 2012. Following computed axial tomography (CAT) findings were evaluated: distribution of IP, extension of IP (extended to central area or localized in peripheral part), and vascular measurement (diameter of the main pulmonary artery at the level of its bifurcation, ascending aorta at same image, and the short axis of inferior vena cava (IVC) between left atria and hepatic vein). Following clinical factors were also investigated: age, gender, smoking index, blood exam (CEA, LDH, KL-6), arterial blood gas, respiratory function, clinical stage of lung cancer. Lobectomy was performed in 73 patients, and limited surgery was performed in 11 patients. Uni- and multi-variate analyses were conducted to determine predictors of surgical mortality. $P < 0.05$ was considered to be significant.

Results:

90-day overall mortality was 1.9%. Based on CAT scan, CPFE was observed in 97 (9.1%) patients with lung cancer. While 90-day postoperative mortality in patients with CPFE was 10.4%, that in patients without CPFE was 1.1% ($p < 0.001$). As to 90-day mortality in patients with CPFE, a multivariate analysis revealed a short axis of IVC (mm) as a predictor (HR 16.1, $p = 0.03$).

Conclusions:

Enlargement of IVC was a significant predictor of 90-day mortality with CPFE patients. The measurement of IVC by CAT scan should be useful for these patients.

Disclosure: No significant relationships.

P-122

UNIPORTAL VIDEO-ASSISTED THORACOSCOPIC BRONCHIAL SLEEVE LOBECTOMY AND BRONCHOPLASTY: INITIAL EXPERIENCE

Diego Gonzalez-Rivas, E. Fieira, M. Delgado, M. De la Torre, R. Fernandez
Thoracic Surgery Department, Coruña Hospital and Minimally Invasive Thoracic Surgery Unit, Coruña, Spain

Objectives:

Video-assisted thoracoscopic (VATS) bronchial sleeve and bronchoplastic procedures are usually performed by conventional VATS. However, these procedures can be performed by using only one incision. We review our experience with VATS bronchial sleeve lobectomy and bronchoplasty for NSCLC through a single incision approach.

Methods:

From March 2012 to December 2013, 7 patients underwent single-port VATS bronchoplastic procedures in our unit: 5 sleeve lobectomies (right upper lobe 2, right upper and middle lobe 1, left lower lobe 1, left upper lobe 1) and 2 wedge bronchoplastic lobectomies (left lower lobe 2). All cases were performed through a 4-5 cm incision placed in the fifth intercostal space with no rib retractor. The end to end sleeve anastomosis was performed by using a continuous suture for membranous part of the bronchus and interrupted sutures for the cartilaginous portion. The wedge bronchoplasty was performed with interrupted sutures.

Results:

The mean operative time was 201 ± 64 min (120-300) with a median blood loss of 170 cc. There was no case of conversion to thoracotomy. Pathological examination showed 4 squamous cell carcinomas, 2 adenocarcinomas and 1 carcinoid. Median tumor size was 2.9cm (1.7-6.4) and median number of lymph nodes was 14 (12-25). The median postoperative chest tube duration was 4 days (2-22), and median hospital stay was 5.5 days (2-18). All patients were followed up for 1–18 months with no signs of recurrence.

Conclusions:

Uniportal video-assisted thoracoscopic bronchoplasty and sleeve lobectomy is a feasible and safe surgical procedure in the treatment of non-small cell lung cancer.

Disclosure: No significant relationships.

P-123

THE IMPACT OF ALFA-AMINOADIPATE AMINOTRANSFERASE MRNA EXPRESSION ON RELAPSE-FREE SURVIVAL IN NON-SMALL CELL LUNG CANCERDariusz Sagan¹, J. Kocki², S. Kaliniak¹, T. Kocki³¹*Department of Thoracic Surgery, Medical University of Lublin, Lublin, Poland*²*Department of Clinical Genetics, Medical University of Lublin, Lublin, Poland*³*Department of Experimental and Clinical Pharmacology, Medical University of Lublin, Lublin, Poland***Objectives:**

Alfa-aminoadipate aminotransferase (AADAT) is a gene located at 4q32.2. The protein product of this gene catalyzes transamination of L-kynurenine into kynurenic acid (KYNA), and thus is called kynurenine aminotransferase 2 (KAT2). Kynurenine metabolic pathway is associated with aggressiveness and other biologic features of non-small cell lung cancer (NSCLC). In this study we assessed mRNA expression of AADAT in samples from tumor tissue, lung parenchyma and lymph nodes in patients with NSCLC, its correlation with local and systemic activity of kynurenine metabolic pathway and impact on relapse free survival.

Methods:

AADAT mRNA expression was assessed using real-time Reverse-Transcriptase Polymerase Chain Reaction method (real-time RT-PCR) in tumor tissue, normal pulmonary parenchyma and lymph nodes samples from 63 patients with NSCLC undergoing pulmonary resection. GAPDH gene was used as a reference. Kynurenine pathway activity was assessed in tissues and serum by KYNA level measurement using ion-exchange resin and high performance liquid chromatography (HPLC).

Results:

mRNA AADAT expression in normal pulmonary parenchyma was higher than in tumor samples or lymph nodes (mean 11.46 ± 43.38 vs. 0.75 ± 1.17 ; or 0.05 ± 0.06 $p=0.0067$). AADAT expression in tumor samples was the highest in adenocarcinoma (1.52 ± 1.15), lower in squamous (0.4 ± 0.76) and the lowest in large cell lung cancer (0.23 ± 0.38) ($p=0.0001$). mRNA AADAT expression in lymph nodes showed positive correlation with peripheral blood KYNA level ($R=0.9$; $p=0.04$), and negative correlation with KAT1 activity in tumor samples ($R=-0.3$; $p=0.04$). In Kaplan-Meier estimation high AADAT mRNA expression in tumor was significantly associated with poor relapse free survival (Fig. 1; $p=0.041$).

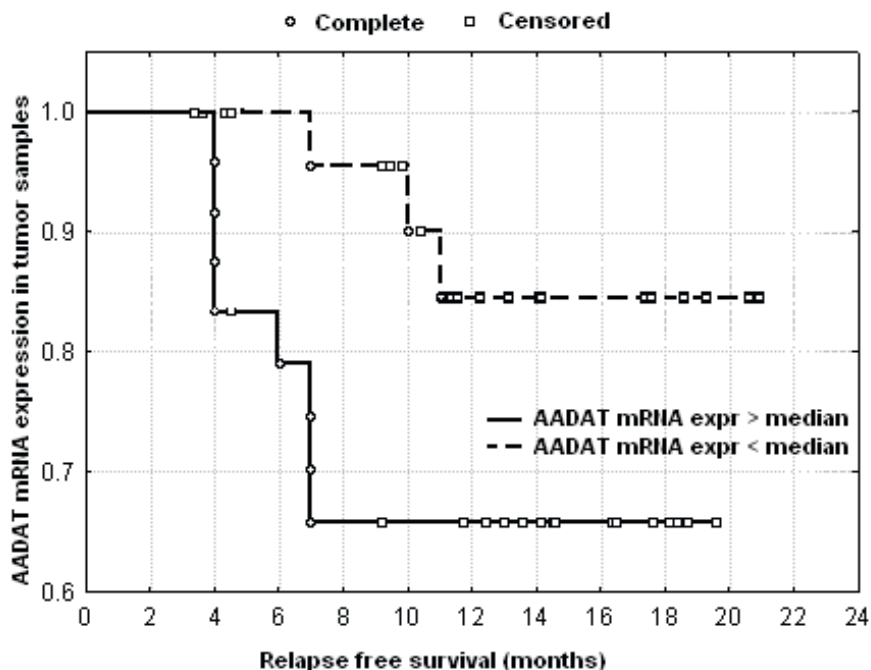


Fig. 1. Kaplan Meier estimation: relapse free survival vs. AADAT mRNA expression in tumor samples; $p=0.041$)

Conclusions:

High expression of AADAT mRNA in tumor tissue negatively influences relapse-free survival in patients with NSCLC undergoing pulmonary resections. It may be a novel adjunct criterion to select patients who require aggressive postoperative adjuvant treatment.

Disclosure: No significant relationships.

P-124

MAXIMUM DIMENSION OF PART-SOLID TUMORS IS NOT EQUAL TO PURE-SOLID TUMORS AS A PROGNOSTIC IMPACT OF T DESCRIPTOR FOR LUNG CANCER. PROPOSALS FOR THE OTHER MEASUREMENT AS T DESCRIPTOR FOR PART-SOLID TUMORS

Tatsuo Maeyashiki, K. Suzuki, K. Takamochi, S. Oh

General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

Showing Ground glass nodule (GGN) on thin-section CT scan in lung cancer has a very good prognosis and a minimally invasive nature on pathological examination. However, only the maximum tumor dimension has been considered when defining the T descriptor, regardless of the presence of GGN. Our previous study also showed that tumors with the presence of GGN, i.e. part-solid, with small size of solid component have less frequency of nodal involvement, regardless of maximum tumor dimension. The purpose of this study was to examine the prognostic impact of maximum tumor dimension in patients with N0M0 tumors, and to see whether current T descriptor is useful for part-solid tumors as same as pure-solid tumors.

Methods:

Between February 2008 and March 2013, 341 consecutive patients with part-solid tumors of pathological T1a, T1b, and T2aN0M0 underwent complete surgical resection (R0) with nodal dissection at our hospital. Part-solid tumors were defined as a tumor containing both solid and GGN component. Consolidation tumor ration (CTR) of those tumors showed $0 < \text{CTR} < 1.0$. Survival was calculated by the Kaplan-Meier method and significance value was examined from log-rank test.

Results:

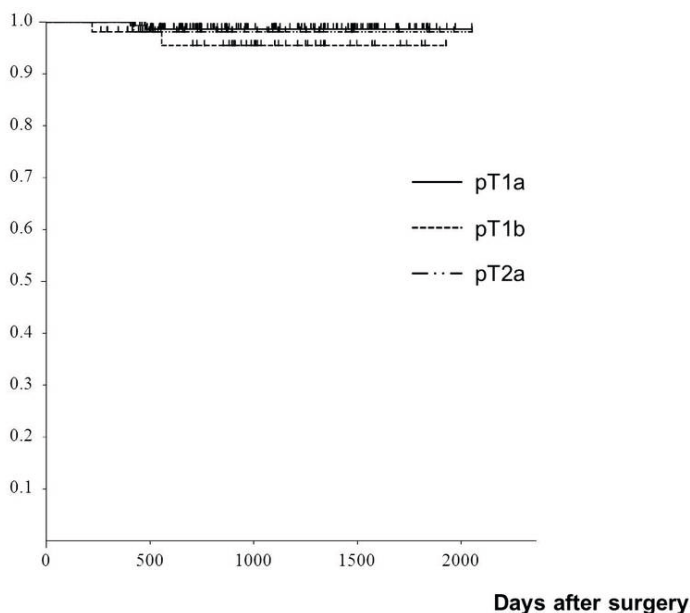


FIGURE 1. Overall survival by tumor size for patients with pT1- or pT2aN0 part-solid tumors

In 341 of these patients, the part solid tumors had sufficient pT descriptors and were distributed as follows: 216 (63%) pT1a, 59 (17%) pT1b and 66 (20%) pT2a cases. Median follow up period of this study was 26 months and cancer-related death was observed in 5 (1.4%) patients. When comparing overall survival between groups of patients defined by tumor size, we found that survival differences were not significant as shown figure 1.

Conclusions:

This study showed that part-solid tumors 5 cm or smaller in diameter shown no different prognosis by tumor size. It also suggests that part-solid tumors should be assessed by the other measurement of the T descriptor separately from pure-solid tumors, regardless of the maximum tumor dimension.

Disclosure: No significant relationships.

P-125

A REFERRAL PROFORMA REDUCES TIME FROM SURGICAL RESECTION TO ADJUVANT CHEMOTHERAPY IN LUNG CANCER PATIENTS

Ashvini Menon¹, K. Hewitt¹, J. King², P. Taylor², M. Jones¹, P. Krysiak¹, R. Shah¹, K. Rammohan¹

¹Thoracic Surgery, University Hospital South Manchester, South Manchester, United Kingdom

²Thoracic Oncology, University Hospital South Manchester, South Manchester, United Kingdom

Objectives:

Adjuvant chemotherapy (AC) within 60 days of surgery has been shown to successfully reduce recurrence rates following resection of stage II and III NSCLC and larger stage IB tumours. A fast track referral system (FTRS) to the oncology department was implemented in 2011. We compared the effectiveness of the FTRS from October 2011 to January 2013 with a previous departmental audit from 2005-2009.

Methods:

In the FTRS, patients are advised at preadmission clinic about possible need for oncology assessment and post-operative AC. A field stating, "AC maybe indicated" is generated in the pathology report of appropriate patients. This triggers an email to the thoracic surgery specialist nurse who then faxes a referral to the oncology unit and intimates the patient. Prior to this, patients were referred when the surgeon had reviewed the histology and a referral letter subsequently dictated to the oncologist.

Results:

In 2005-2009, 282 patients were referred for AC. 122 patients (43%) commenced AC of whom 35 patients (29%) did so >60 days post-surgery. Following the implementation of the FTRS, 238 patients were referred for AC. 160 patients (67%) commenced AC of whom only 30 (19%) did so >60 days post surgery. The median time from surgery to oncology clinic with the FTRS was reduced from 40 to 35 days (IQR 29-42). The main reasons for delay in AC include slow recovery following surgery and pre-booked holidays.

Conclusions:

The FTRS is a significant service improvement resulting in a greater proportion of patients commencing AC within 60 days of surgery.

Disclosure: No significant relationships.

P-126

NEOADJUVANT CHEMORADIATION VS CHEMOTHERAPY FOLLOWED BY SURGERY FOR NSCLC: DOWNSTAGING FROM STAGE IIIA TO STAGE I

Huseyin Melek¹, A. Demir², A.S. Bayram¹, B. Özkan², G. Çetinkaya¹, M. Kapdağlı², M.M. Erol¹, S. Sarihan¹, A. Toker², C. Gebitekin¹

¹Thoracic Surgery, Uludag University, Faculty of Medicine, Bursa, Turkey

²Thoracic Surgery, Istanbul University, Istanbul School of Medicine, Istanbul, Turkey

Objectives:

Chemoradiation increases the complete sterilization rate of mediastinum as well as the tumor compared to Neoadjuvant chemotherapy in patients with NSCLC. However, late complications of radiotherapy may cause early deaths that escape from mortality rates. In this study we aimed to show the prognostic effects of neoadjuvant chemoradiotherapy in patients with stage IIIa NSCLC that was downstaged to stage I (T0-2N0).

Methods:

We retrospectively evaluated the data of 422 patients undergoing lung resection after neoadjuvant therapy between 1996 and 2013. Among these cases; 147 cases downstaged from stage IIIa to I. All but 9 patients were male with a mean age of 58y (36-85years). The pathological examination revealed complete response in 45 patients (T0N0), T1N0 in 47 patients and T2N0 in 55 patients. Neoadjuvant treatment was chemotherapy in 77(group I) and chemoradiation in 70 patients (group II). Both groups were compared for morbidity, 90 days mortality and long-term survival. Mortality occurred between 90 days to one year was also recorded and compared between the groups.

Results:

Complete response or downstaging to stage I was superiorly achieved by chemoradiation (70%) compared to chemotherapy (30%), $p=0.02$. The one year mortality was observed in 8 patients (10%) in group I and only in three patients (4.2%) in group II. Morbidity observed in 27.9% of patients with a 90-days mortality of 2% (2.5% in group I and 1.4% in group II). 5-year survival rate was 62,7% in group II and 44,5% in group I, $p=0,03$. Multivariate analysis revealed that the complete response rate was the only prognostic factor in the groups.

Conclusions:

Adding radiotherapy to neoadjuvant chemotherapy increases complete response rate and downstaging ratio in patients with stage IIIa NSCLC. Excellent long term survival without postoperative mortality was achieved in patients treated with neoadjuvant chemoradiation and surgery.

Disclosure: No significant relationships.

P-127

SHOTGUN AND TARGETED PROTEOMICS REVEAL THAT PRE-SURGERY SERUM LEVELS OF LRG1, SAA, AND C4BP MAY REFINE PROGNOSIS OF RESECTED SQUAMOUS CELL LUNG CANCER

Xiaoyang Luo, Y. Liu, R. Wang, H. Hu, Y. Pan, L. Wang, T. Ye, Y. Zhang, H. Li, Z. Sun, D. Cai, Y. Sun, R. Zeng, H. Chen

Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

Few serological biomarkers have been identified in patients with resected squamous cell lung cancer (SCC) that predict favorable outcomes. By combining shotgun and targeted proteomics, the aim of this study was to identify blood biomarkers that might favor patient-tailored prognosis refinement for SCC. Previous studies are normally targeted gene signatures or immunohistochemical protein signatures for prognosis prediction.

Methods:

In a discovery phase, using a paired strategy and label-free proteomic quantification, we identified several significantly regulated proteins related to rapid relapse. During the verification phase, Selected Reaction Monitoring (SRM) assays were used to absolutely measure the serum protein concentration.

Results:

Serum levels of C4b-binding protein alpha (C4BP), Leucine-rich alpha-2-glycoprotein (LRG1), and Serum amyloid A protein (SAA) were revealed to be strongly associated with the disease-free phase (7.44 ± 2.08 months versus $>27.04 \pm 5.73$ months) after surgery. Using a training set of 60 SCCs and an independent validation set of 56 SCCs (all at stage IIb or IIIa), we suggested C4BP, LRG1 and SAA in pre-therapy blood can be predictive for prognostic outcomes of resected SCC (sensitivity, 80.0%; specificity, 73.08%). Moreover, by a comparison to 72 age-matched healthy controls, LRG1 and SAA showed potentials as multimarkers for both SCC and its poor prognosis while C4BP only showed a strong correlation with fast recurrence.

Conclusions:

The triple biomarkers are significant relapse-related signatures in pre-therapy blood and therefore might be useful in identifying stage IIb and IIIa SCC patients at risk for an unfavorable outcome.

Disclosure: No significant relationships.

P-128

ROBOTIC & VATS LUNG SEGMENTECTOMY FOR MALIGNANT AND BENIGN DISEASES

A. Demir¹, K. Ayalp², Berker Özkan¹, E. Kaba², M. Kapdağlı¹, O. Demirhan², J. Grusina Uyumaz², A. Toker¹

¹*Thoracic Surgery, Istanbul University, Istanbul School of Medicine, Istanbul, Turkey*

²*Surgery, Group Florence Nightingale Istanbul Hospital, Istanbul, Turkey*

Objectives:

The experience in pulmonary segmentectomy is still limited with robotic techniques (RATS) and video-assisted thoracic surgery (VATS). We evaluated our prospectively recorded database to compare two different minimally invasive techniques.

Methods:

Between May 2007, and December 2013, a total of 61 patients underwent RATS (n=21) and VATS (n=40) pulmonary segmentectomies at two institutions. The median age of patients was 57±15 (18-84) years, and 66% were male. Fourty-six patients were operated on for malignancy and 15 for benign diseases. Patients with malignant diseases, either primary or secondary lung cancer, underwent mediastinal and hilar lymphadenectomies.

Results:

The morbidity and mortality rates were 7% - 0 and 16% - 2.5% for RATS and VATS (=0.75) and (p>0.05) respectively. Mean Console time for RATS was longer than mean operation time for VATS [(84± 26 (40-150) vs 61 ±21(30-110) minutes (p=0.008)]. Mean duration of drainage was similar days for RATS and VATS [(3±2.1(1-10) days vs 3±1.9(1-10), (p= 0.61)] respectively. Duration of postoperative stay for RATS was 4 ± 1.4 (2-7) days and VATS was 5.7 ± 4.3 (2-20) days (p=0.09). Adhesion scores were 0.6 ± 1.2 (0-4) for RATS and 1.1 ± 1.5 (0-7) for VATS (p=0.16).

Conclusions:

Both RATS and VATS pulmonary segmentectomy operations are performed with similar morbidity and mortality rates. Although duration of operation is longer in RATS, there is a tendency towards shorter postoperative stay.

Disclosure: No significant relationships.

P-129

DOES THE HISTOLOGICAL SUBTYPE OF ADENOCARCINOMA INFLUENCE THE EXTENT OF RESECTION IN PATIENTS WITH CLINICAL STAGE IA ADENOCARCINOMA?

Hiroyuki Ito¹, H. Nakayama¹, T. Nishii¹, K. Imai¹, S. Murakami², M. Okada³, M. Masuda⁴

¹*Department of Thoracic Surgery, Kanagawa Cancer Center, Yokohama, Japan*

²*Department of Thoracic Oncology, Kanagawa Cancer Center, Yokohama, Japan*

³*Thoracic Surgery, Hiroshima University, Hiroshima, Japan*

⁴*Department of Surgery, Yokohama City University Graduate School of Medicine, Yokohama, Japan*

Objectives:

We aimed to identify whether histological subtype according to the new IASLC/ATS/ERS lung adenocarcinoma (AD) classification influences the recurrence after complete resection for patients with clinical stage IA AD, especially in terms of extent of resection.

Methods:

The clinicopathological data of 357 patients with clinical stage IA AD were retrospectively analyzed.

Results:

Median follow up period was 38.9 months. 192 patients underwent lobectomies and sublobar resections were done in 155 patients (56 segmental resections, 99 wedge resections). The distribution of the histological subtype was adenocarcinoma in situ (AIS) in 56 patients (16.1%), minimally invasive (MIA) in 15 (4.3%), lepidic in 109 (31.4%), papillary in 70 (20.2%), acinar in 61 (17.6%), solid in 30 (8.6%) and micropapillary in 6 (1.7%). Thirty two patients recurred; 17 in local, 12 in distant and 3 in both. The 5-year disease free survival (5-yr DFS) rates according to histological subtype were 100% for AIS and MIA, 99.1% for lepidic, 82.4% for papillary, 80.8% for acinar, 73.6% for solid, and 33.3% for micropapillary. The 5-yr DFS in LO and LR were 100% and 100% for AIS and MIA, 98.1% and 100% for lepidic, 83.9% and 77.8% for papillary, 81.3% and 74.3% for acinar, 71.2% and 87.5% for solid, and 75.0% and 0% for micropapillary, respectively. While the survival rate in patients with AIS+MIA and lepidic AD was significantly better than those for the other histological subtypes, micropapillary AD had significantly worse prognoses than the other histological subtypes. LN metastasis was found in 1.9% for lepidic, 15.7% for papillary, 8.2% for acinar, 6.7% for solid and 33.3% for micropapillary.

Conclusions:

While patients with AIS, MIA and lepidic AD can be cured either by LO or by LR, the possibility of LN metastasis should be kept in mind to perform LR for the patients with the other subtypes.

Disclosure: No significant relationships.



P-130

UNIPORTAL VIDEO-ASSISTED THORACOSCOPIC MAJOR PULMONARY RESECTIONS: EXPERIENCE WITH 323 CASES

Diego Gonzalez-Rivas, M. Delgado, E. Fieira, R. Fernandez, L. Mendez, M. De La Torre
Thoracic Surgery Department, Coruña Hospital and Minimally Invasive Thoracic Surgery Unit, Coruña, Spain

Objectives:

Uniportal video-assisted thoracic surgery (VATS) anatomic major pulmonary resections were initially described as an evolution from conventional approach in our unit. Since then, many thoracic surgical departments have successfully adopted this technique with good postoperative results. We report our experience with this minimally invasive technique for major pulmonary resections.

Methods:

In June 2010, we began performing VATS anatomic resections through a uniportal approach (non-rib spreading). By December 2013, 323 patients had undergone major pulmonary resections by this single-incision approach. We have included early stage tumors, advanced NSCLC (bronchial sleeve or vascular reconstruction), complex pneumonectomies and lobectomies after chemo-radiotherapy induction treatment.

Results:

Of 323 attempted major resections, 312 were successfully completed by a single-incision approach (conversion rate 2.9%). We have analysed early outcomes of successful uniportal VATS major pulmonary resections. Right upper lobectomy was the most frequent procedure (25%). Mean surgical time was 139.2 ± 48 minutes (range, 40-310 min), mean number of lymph nodes was 14.8 ± 7 (range, 5-38 nodes) and mean number of explored stations was 4.7 ± 1.1 (range, 3-8 stations) in NSCLC patients. The mean tumour size was 2.8 ± 1.5 cm (0-12). The median chest tube duration was 2 days and the median length of hospital stay was 3 days. There were complications in 60 patients and two patients died during the 60-day postoperative period.

Conclusions:

Single-incision VATS anatomical resection is a safe procedure with good perioperative results. The success in performing complex lobectomies through a single incision is a result of skills and experience accumulated over time from performing uniportal VATS surgery

Disclosure: No significant relationships.

P-131

PROGNOSTIC SIGNIFICANCE OF STANDARDIZED UPTAKE VALUE ON POSITRON EMISSION TOMOGRAPHY IN PATIENTS OF MULTIPLE LUNG CANCERS WITH CLINICAL N0 STATUS

Aritoshi Hattori, K. Suzuki, K. Takamochi, S. Oh

General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

There have been many attempts to differentiate multiple lung cancers (MLCs) using clinico-pathological presentation and molecular profile. However, controversies still remain regarding the prognostic factor of MLCs with clinical-N0 status.

Methods:

Between 1996 and 2012, 131 patients were diagnosed as multiple lung cancers pathologically. Pathological diagnosis was based on Martini and Melamed classification. Main lesion of multiple lung cancers was defined as follow: 1) radiologically denser or larger tumor among synchronous lesions 2) the second tumor among metachronous lesions. Based on these criteria, thin-section CT were reviewed for all and categorized as GGO and solid tumor. Solid tumor was defined as a tumor constructed only by consolidation without GGO.

Results:

Among 131 patients with clinical-N0 status, 66 patients were men and 65 were women with an average of 67 years. One-hundred and nine patients were diagnosed as multiple primary lung cancers (MPLCs), and 22 were intrapulmonary metastases (PMs). Based on multivariate analyses, SUVmax was a significant prognostic factor in both synchronous and metachronous clinical-N0 MLCs ($p=0.0060$, 0.0451 , respectively). Of overall patients, furthermore, while pathological diagnosis, maximum tumor dimension, consolidation status and SUVmax were the significant prognostic factors by a univariate analysis, SUVmax ($p=0.0016$) was an independent significant prognostic factor superior to pathological diagnosis ($p=0.2258$) based on a multivariate analysis. The 5-year overall survival rate (OSR) of MPLCs (78.7%) was significantly greater than that of PMs (30.5%) ($p=0.0036$). Furthermore, the 5-year OSR in patients with low SUVmax (91.1%) was by far better than that with high SUVmax (17.9%) ($p<0.0001$).

Conclusions:

SUVmax on PET was a significant clinical factor to reflect the prognosis of MLCs with clinical-N0 status more precisely, which could be useful superior to pathological diagnosis based on Martini and Melamed classification. Based on our results, SUVmax on PET has a great clinical impact on surgical strategies in patients with c-N0 MLCs.

Disclosure: No significant relationships.

P-132

BRONCHIALSLEEVE RESECTION OR PNEUMONECTOMY FOR NON-SMALL CELL LUNG CANCER: A PROPENSITY MATCHED ANALYSIS OF LONG TERM SURVIVAL AND QUALITY OF LIFE

Saana E M Andersson, I.K. Ilonen, J.V. Räsänen, E.I. Sihvo, J.A. Salo

Clinic of General Thoracic and Esophageal Surgery, Helsinki University Central Hospital, Heart and Lung Center, Helsinki, Finland

Objectives:

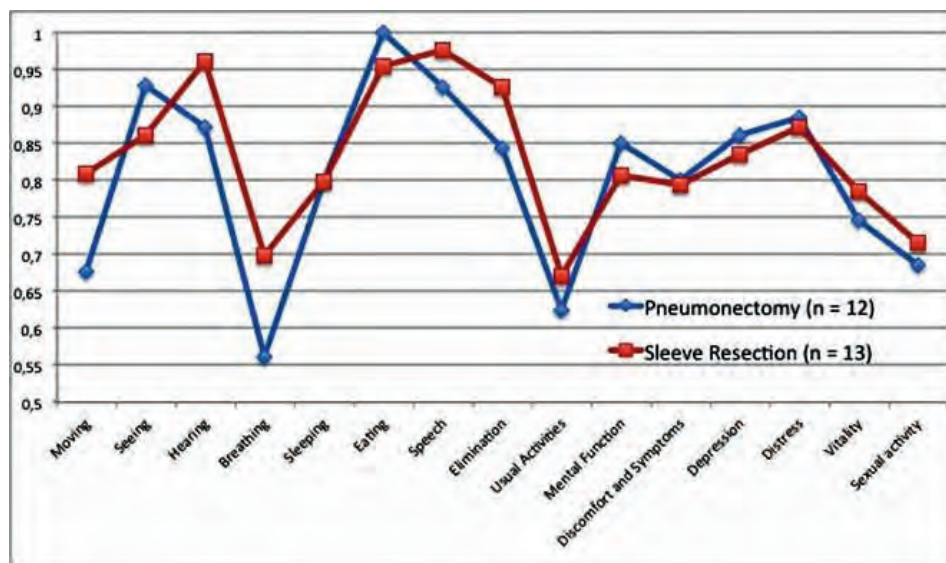
To determine retrospectively postoperative long-term survival and quality of life in patients operated for non-small cell lung cancer (NSCLC) using sleeve lobectomy or pneumonectomy.

Methods:

641 NSCLC-patients were operated 2000-2010. Pneumonectomy was utilized in 67 patients and SL in 40. In 2012 all patients alive were sent validated 15D Quality of Life Questionnaires; of them 83% replied.

Results:

After propensity score matching analysis 32 bronchial (right 18/left 14), seven bronchovascular (right 3/left 4) and one right-wedge sleeve lobectomy, and 18 right and 22 left pneumonectomies were compared. There were no significant differences between groups in age, pre- or postoperative stages, preoperative Charlson Comorbidity Index Score, preoperative FEV₁ or diffusion capacity. Complication rate (50%) was similar between groups. Major complications in pneumonectomy group: 2 bronchopleural fistulas, 2 empyemas, 1 stroke, 1 a-v block. In sleeve lobectomy group: 1 stroke, 1 empyema, 1 pneumonia, and 1 bleeding. Nine patients in pneumonectomy-group were re-operated and 3 in sleeve lobectomy group. There were no operative mortality in sleeve lobectomy group and one (2.5%) in pneumonectomy group. The 90-day mortality for pneumonectomy was 5% (n=2) and for sleeve lobectomy 5% (n=2). No difference was noted in long-term follow-up for distant metastasis rate or logoregional recurrence. Postoperative quality of life showed no significant difference in different dimensions or total score (Figure). The 5-year survival was similar in both groups (p=0.458), and no deaths occurred in sleeve lobectomy patients after 5-year of follow-up, but thereafter 50% of pneumonectomy patients died of non-cancerous causes.

**Conclusions:**

During 5-year follow-up pneumonectomy and sleeve lobectomy showed no significant differences in cancer-specific survival or in quality of life. However, thereafter sleeve lobectomy patients showed better survival. This advocates the use of sleeve lobectomy in central non-small cell lung cancer when feasible.

Disclosure: No significant relationships.

P-133

**PULMONARY METASTASECTOMY IN COLORECTAL CANCER:
CONTRIBUTION TO THE PULMiCC TRIAL DOES NOT HAVE A NEGATIVE
IMPACT ON ACTIVITY**

Matthew Smith, M. Gooseman, S. Scammell, J. Rao, J. Edwards

Cardiothoracic Surgery, Northern General Hospital, Sheffield, United Kingdom

Objectives:

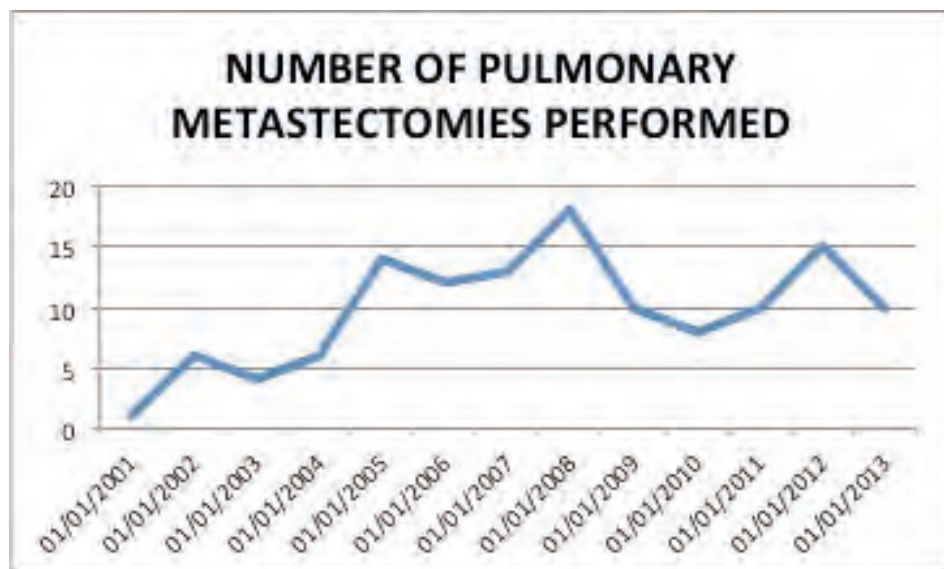
Pulmonary metastasectomy (PM) in colorectal cancer is a controversial subject. The PulMiCC study was created not just to answer whether surgery is of value in cases of “uncertain benefit” but also to characterise, by study registration, which patients are routinely offered surgery and which are declined. PulMiCC opened to recruitment in in 2010 and October 2010 at this centre. Despite the pragmatic entry criteria, recruitment has varied widely between centres. A recent survey of patients taking part in clinical trials did not suggest it was they that were the barrier to recruitment. It is possible that a barrier to recruitment is reticence of surgeons to recruit for fear of losing surgical practice. We aimed to determine the effect of the opening of the PulMiCC study on the performance of PM.

Methods:

The number of cases receiving surgery or entering PulMiCC were reviewed by year from 2001 to October 2013. Characterisation of cases was performed by the assessment of predictive factors and the determination of Risk Groups, as proposed by the PulMiCC Study Team. These were compared before and after the study opened.

Results:

Numbers of PM per annum have increased overall, with no reduction after the study opened ($p=1$).



There have been no changes in the time elapsed from colorectal primary ($p=0.1$), presence of liver metastases ($p=0.05$) or pre operative CEA level ($p=0.2$). An increase in patients with bilateral disease ($p=0.04$) and the number of pulmonary metastases per patient ($p=0.005$) were observed, however there was no overall change in the risk factor group distribution ($p=0.861$) with the opening of the trial.

Conclusions:

The number of cases receiving PM has not reduced since the study opened. Surgeons can be reassured that their positive contribution to the PulMiCC study need not have a negative impact on the number of pulmonary metastasectomies that they perform.

Disclosure: No significant relationships.



P-134

LEARNING CURVES FOR VIDEO ASSISTED THORACOSCOPIC LOBECTOMY: FROM THREE-PORT TO SINGLE-PORT

Y. Shen, Lijie Tan, M. Feng, H. Wang, Q. Wang

*Department of Thoracic Surgery, Zhongshan Hospital of Fudan University, Shanghai, China***Objectives:**

Recently, single-port video assisted thoracoscopic (VATS) lobectomy was becoming popular for the advantage of fewer traumas. However, the learning curve for this procedure was less learned. In this report, we described our single-center experience on learning curve that a surgeon needs to have VATS lobectomy performed from three-port to single-port.

Methods:

From July 2013 to December 2013, we conducted VATS lobectomy in three-port and then the single-port on consecutive patients admitted to our institution. The switching from three-port to single-port was in October 2013. The patients were divided into four groups: Group SP1 (Single-port) comprised cases in the first 10 cases underwent uniportal VATS lobectomy, Group SP2 comprised cases 11 to 20, and Group SP3 included the final 10 cases. Patients underwent VATS by three-port (TP) was reviewed as historical controls. The demographic characteristics and the peri-operative variables were collected and compared to identify the differences between different periods of VATS lobectomy.

Results:

A total of 60 consecutive patients were enrolled. Thirty had their operations performed in three-port and 30 in single-port. There was no significant difference found between the two groups in clinical features. Significantly longer duration was recorded in SP1 than in TP (115 versus 67 minutes, $p < 0.001$), while SP2 and SP3 had a close duration in compared with TP (70 minutes and 75 minutes, $p = 0.813$). Similar findings were observed in the estimated volume of bleedings recorded during the operation (90ml versus 210ml, 114ml, 105ml, $p = 0.030$) in TP, SP1, SP2, SP3, respectively.

Conclusions:

The switching from three-port to single-port VATS lobectomy is safe, and requires at least 10 cases to reach the plateau of learning curve in the experienced hands. Further study based on larger population is required to confirm this finding.

Disclosure: No significant relationships.

P-135

COMPARISON OF THE PATTERN OF NODAL METASTASIS IN LUNG CANCER BETWEEN MIDDLE LOBE AND LINGULAR LOBE

Ryosuke Tachi, K. Suzuki, A. Hattori, T. Matsunaga, S. Oh, K. Takamochi
General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

Compared with upper and lower lobe, pattern of nodal metastasis of lung cancer in the middle or lingular lobe remain unclear. We investigated the difference of the patterns between those lung cancers.

Methods:

Between 1996 and 2013, there were 2025 patients with resected lung cancer. Among them, 169 (8.3%) patients had lung cancer located in the right middle (n=102), or lingular (n=67) lobe, respectively. Patterns and features of nodal involvement in patients with middle or lingular lobe lung cancer were investigated using Chi-square test.

Results:

The patients were consisted of 91 men and 78 women. Lobectomy was performed in 137 patients, consisted of 94 (68.6%) right middle lobectomy and 43 (31.4%) left upper lobectomy. Furthermore, mediastinal lymph node dissection was performed in 116 (69.2%) patients. Lymph node metastases were found in 41 (24.3%) of all eligible lung cancer patients. Among them, 21 (20.6%) and 20 (29.9%) patients located in the right middle and lingular lobe, respectively. The frequencies of hilar lymph node metastases were not statistically different ($p=0.27$). In contrast, while subcarinal lymph node metastasis was found in 10 (47.6%) of the middle lobe lung cancer, only 1 (5%) showed nodal involvement in the lingular lobe, which revealed significant difference between these 2 groups ($p=0.021$). As to the frequency of superior mediastinal lymph node or skip metastasis, there was no statistical difference between the middle and lingular lobe lung cancer ($p=0.21$ and 0.24 respectively).

Conclusions:

Lung cancer in the middle lobe metastasizes to the subcarinal node more frequently than lingular lobe. Though further investigation warranted with regard to the features of pathway of nodal involvement in these patients, there could be some possibility of selective nodal dissection for lung cancer in the lingular lobe.

Disclosure: No significant relationships.

P-136

THE PROGNOSTIC IMPACT OF THORACIC LYMPHADENECTOMY DURING PULMONARY METASTASECTOMY IN CLINICALLY LYMPH NODE-NEGATIVE PULMONARY METASTASIS

Kook Nam Han¹, C.H. Kang², I.K. Park², H.J. Lee², Y.T. Kim²
¹Thoracic and Cardiovascular Surgery, Korea University Guro Hospital, Seoul, Korea

²Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea

Objectives:

The prognostic significance of routine thoracic lymphadenectomy during pulmonary metastasectomy is unclear and creates a dilemma in whether a routine lymphadenectomy in clinically node-negative patients is needed.

Methods:

We examined the incidence of lymphatic invasion and outcomes of 270 lymphadenectomies during pulmonary metastasectomy in 478 patients with clinically node-negative pulmonary metastasis on the CT and PET.

Results:

Sampling (n=136) or systematic lymphadenectomies (n=134) of mediastinal, hilar and peribronchial lymph nodes were performed during pulmonary metastasectomy. There was one (0.7%) peribronchial- and one (0.7%) mediastinal metastatic lymph node in the sampling group. Ten (7.5%) peribronchial and 11 (8.2%) mediastinal metastatic nodes were detected by systematic lymphadenectomy. There were non-imaged lymphatic invasions in 4 soft tissue sarcomas (13.8%), 6 renal cell cancers (12.5%), 2 breast cancers (11.8%) and 10 colorectal cancers (10.4%) in each cell type. Multiple lung lesions (≥ 2) ($p=0.338$), disease free interval (< 36 months) ($p=0.403$) or both ($p=0.426$) were not risk factors for non-imaged lymphatic invasion. In the subgroup analysis, the presence of non-imaged metastatic nodes showed poor survival in colorectal cancer ($p=0.030$) and high intrathoracic recurrences in colorectal cancer ($p=0.042$) and soft tissue sarcoma ($p=0.012$). A routine lymphadenectomy during pulmonary metastasectomy did not improve the overall survival ($p=0.502$) and intrathoracic recurrence ($p=0.216$) in node-negative pulmonary metastasis.

Conclusions:

Lymph node involvement in pulmonary metastasis may represent the advanced stage of disease and could be an independent prognostic factor in clinically node-negative pulmonary metastasis. However, a routine lymph node dissection during pulmonary metastasectomy has a limited role in clinically node-negative pulmonary metastasis.

Disclosure: No significant relationships.

P-137

HIGH-QUALITY SECRETOME OF A549 CELLS AIDED THE DISCOVERY OF C4B-BINDING PROTEIN AS NOVEL SERUM BIOMARKER FOR NON-SMALL CELL LUNG CANCER

Xiaoyang Luo, Y. Liu, R. Wang, H. Hu, Y. Pan, L. Wang, T. Ye, Y. Zhang, H. Li, Z. Sun, D. Cai, Y. Sun, R. Zeng, H. Chen

Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

Cancer secretomes are a promising source for biomarker discovery. The analysis of cancer secretomes still faces some difficulties mainly related to the intracellular contamination, which hinders the qualification and follow-up validations. This study aimed to establish a high-quality secretome of A549 cells by using the cellular proteome as a reference and to test the merits of this refined secretome for biomarker discovery for non-small cell lung cancer (NSCLC).

Methods:

Using one-dimensional gel electrophoresis followed by liquid-chromatography tandem mass spectrometry, we comprehensively investigated the secretome and the concurrent cellular proteome of A549 cells.

Results:

A high-quality secretome consisting of 382 proteins was refined from 889 initial secretory proteins. More than 85.3% of proteins were annotated as secreted and 76.8% as extracellular or membrane-bound. The discriminative power of the lung-cancer associated secretome was confirmed by gene expression and serum proteomic data. The elevated level of C4b-binding Protein (C4BP) in NSCLC blood was verified by enzyme-linked immunosorbent assays (ELISA, $p = 6.07e-6$). Moreover, the serum C4BP level in 89 patients showed a strong association with the clinical staging of NSCLC.

Conclusions:

Our reference-experiment-driven strategy is simple and widely applicable, and may facilitate the identification of novel promising biomarkers of lung cancer.

Disclosure: No significant relationships.

P-138

CIRCULATING TUMOR CELLS IN THORACIC MALIGNANCIES: SEPARATION AND CULTIVATION IN VITROVladimir Bobek¹, R. Lischke², J. Schutzner², K. Kolostova¹¹*Department of Tumor Biology, Charles University Prague, Prague, Czech Republic*²*3rd Department of Surgery, University Hospital Motol, Prague, Czech Republic***Objectives:**

Circulating tumor cells (CTCs) in peripheral blood are important targets for treatment, and critical surrogate markers for evaluating cancer prognosis and therapeutic response. The high sensitive methodology to detect CTCs in the patients with thoracic malignancies is needed. We demonstrate a methodology for enrichment, separation and cultivation of CTCs in this study.

Methods:

Patients with non small cell lung cancer (NSCLC) and esophageal cancer (EC) and malignant pleural mesothelioma (MPM) were enrolled into study. Peripheral blood samples were collected before surgery. A new size-based separation test for detection and cultivation of CTCs was used (MetaCell®).

Results:

CTCs were detected in 59% patients with EC (n=27/46), in 64% with NSCLC (n= 32/50) and in 80% patients (n= 4/5) with MPM. A Successful capture of the viable CTCs was followed by their subsequent cultivation in vitro in all three types of cancers.

Conclusions:

The overall size-based filtration approach enabled to capture viable CTCs. The CTCs were cultured in vitro for further downstream applications, e.g immunohistochemical analysis, which has been directed to prove the epithelial origin of the captured cells. We are describing for the first time successful cultivation of EC, NSCLC and MPM CTCs here.

Disclosure: No significant relationships.

P-139

WHICH VARIABLES BEST PREDICT OUTCOMES IN PATIENTS WITH STAGE II/III NON-SMALL-CELL LUNG CANCER AFTER NEOADJUVANT THERAPY?

Naoki Ozeki, K. Kawaguchi, T. Taniguchi, N. Usami, T. Fukui, F. Ishiguro, S. Nakamura, K. Yokoi

Department of Thoracic Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan

Objectives:

It is debatable which variables best predict outcomes in patients with non-small-cell lung cancer (NSCLC) after neoadjuvant therapy; evaluation by response evaluation criteria in solid tumors (RECIST), tumor volume response (VR) and maximum standardized uptake value (SUVmax) on ¹⁸F-fluorodeoxyglucose positron emission tomography. This study was designed to elucidate the predictive usefulness of evaluation by RECIST, VR and post-neoadjuvant SUVmax (ySUVmax).

Methods:

Between December 2006 and June 2012, 33 patients who were diagnosed as clinical stage II/III NSCLC and underwent pulmonary resection following neoadjuvant therapy were enrolled in this study. Relationships between the variables and pathological complete response (pCR), disease-free survival (DFS) and overall survival (OS) were analyzed.

Results:

The patient and tumor characteristics were as follows; the mean tumor volume: 84.3 ml; cN0/cN1/cN2: n = 20/3/10; the mean SUVmax: 13.9; neoadjuvant therapy (chemoradiotherapy/chemotherapy/radiotherapy): n = 24/5/4; the mean post-neoadjuvant tumor volume: 41.9 ml; VR (50% reduction in tumor volume)/non-VR: n = 21/12; ycN0/ycN1/ycN2: n = 23/5/5; the mean ySUVmax: 5.5; evaluation by RECIST (PR/SD): n = 12/21; pCR/non-pCR: n = 8/25; ypN0/ypN1/ypN2: n = 26/5/2. The median follow-up period was 42 months. The 3-year DFS was 70%, and the 3-year OS was 78%. ySUVmax had significant relation to pCR (p = 0.0067), while VR did not. pCR was found in 8% of the tumors with PR and in 33% of the tumors with SD. In the multivariate Cox regression analysis with a cut off value of ySUVmax 7.5, both VR and ySUVmax were significant factors for DFS (p = 0.0045, 0.0455). ySUVmax was a significant factor also for OS (p = 0.0307). Evaluation by RECIST was not a significant factor for DFS nor OS.

Conclusions:

VR and ySUVmax following neoadjuvant therapy can be valid alternative parameters to predict survival for patients with stage II/III NSCLC.

Disclosure: No significant relationships.



P-140

**INTRODUCING ROBOTIC LUNG RESECTIONS INTO RESIDENCY TRAINING:
CAN THIS BE DONE IN A FEASIBLE MANNER?**Raghav Murthy, K. Kernstine*Thoracic Surgery, UT Southwestern Medical Center, Dallas, United States of America***Objectives:**

Lung resection for cancer has been gradually moving from open thoracotomy to minimally invasive methods. Thoracoscopic (VATS) lung resection has become very popular among surgeons and has been successfully integrated into residency teaching programs. We sought to retrospectively review minimally invasive lung resections performed at our institution for the past 5 years to determine the effect of introducing robotic lung resections to a residency program.

Methods:

The charts of patients who underwent minimally invasive lung resection from January 1, 2009 to October 31, 2013 were reviewed. The gender, smoking, pre-operative PFT's were compared between the VATS and the robotic group. The procedure time, ICU stay, length of stay and number of lymph nodes resected were compared between both the groups.

Results:

In the above mentioned time frame a total of 278 lung resections were performed in a minimally invasive manner for cancer. 109 of these were performed robotically and 169 by VATS. 45% of the robotic group and 48.5% of the VATS group were female. The pre-operative variables between the robotic and VATS group were similar with respect to smoking (mean: 32.72 vs 39.93, $p=0.3$) and FEV1 % (mean: 84.33 vs 80.82, $p=0.23$). The DLCO was lower in the VATS group (mean: 70.14 vs 80.42, $p=0.0003$). There was no significant difference between the robotic or VATS group with respect to ICU stay (mean: 0.33 vs 0.65, $p=0.5$). However, length of hospital stay (mean: 5.23 vs 9.09 days, $p=0.01$) and number of lymph nodes harvested were better in the robotic group (mean: 21.95 vs 11.11, $p=0.0001$). The procedure time required to complete a robotic resection was significantly longer (mean: 209 vs 111.83 mins, $p=0.0001$).

Conclusions:

Introduction of robotic lung resection into a residency training program is a feasible option. Its was also associated with a shorter LOS and superior number of lymph nodes resected.

Disclosure: No significant relationships.

P-141

INTERSTITIAL GROWTH PATTERN AS ONE OF THE INDICATOR OF MALIGNANCY IN PRIMARY LUNG CANCER

Shigeki Suzuki¹, G. Ishii¹, K. Aokage¹, T. Hishida¹, J. Yoshida², K. Nagai²

¹Pathology, National Cancer Center Hospital East, Chiba, Japan

²Thoracic Surgery, National Cancer Center Hospital East, Chiba, Japan

Objectives:

Interstitial growth, which was defined as tumor cells growing into the alveolar septae, was reported as one of the growth pattern of metastatic sarcoma. However clinicopathological features of the primary lung cancer showing interstitial growth were remained unclear.

Methods:

Between 2003 and 2012, 2557 patients with primary lung cancer underwent resection at our division. Among them, 34 (1.3%) cases had interstitial growth pattern. We compared the clinicopathological characteristics between interstitial growth positive and negative groups.

Results:

The presence of interstitial growth was significantly associated with higher positive rate for smoking history ($P = 0.03$), advanced pathological stage ($P = 0.03$), vascular invasion ($P < 0.01$) and pleural invasion ($P = 0.01$). Interstitial growth positive tumors were classified as 10 squamous cell carcinoma, 9 pleomorphic carcinoma, 7 adenocarcinoma, 5 large cell carcinoma, 2 adenosquamous carcinoma and 1 small cell carcinoma. Interstitial growth positive cases displayed significant poor prognosis than interstitial growth negative cases in the RFS ($P = 0.013$, Their 5- year RFS : 42.6% and 62.9%) and the OS ($P = 0.016$, Their 5- year OS ; 56.5% vs 70.2%).

Conclusions:

Interstitial growth in primary lung cancer was detected in the various subtypes, mainly in squamous cell carcinoma and pleomorphic carcinoma. They displayed significant poor prognosis than interstitial growth negative cases.

Disclosure: No significant relationships.

P-142

AGE AS A LIMIT FOR RESECTION: TRUTH OR MYTH?

E. Teh, Muhammed Ibrahim, E. Belcher, E. Black

Thoracic Surgery, John Radcliffe Hospital, Oxford, United Kingdom

Objectives:

Experience in our clinics have led us to believe that elderly patients are often excluded from curative (radical) lung resection purely based on their age. Whilst there may be valid biological reasons why elderly patients may be considered high risk; such as resultant oxidative stress with increasing age may cause alterations with enzymes activities and increase tissue fragility, advances in surgery may mitigate some of these risks. Is it still true that the very elderly are not suitable for curative lung resections? We wanted to assess our outcomes in octogenarians and additionally compare curative lung resections by video-assisted thoracoscopic (VATS) and open techniques.

Methods:

A prospective database containing patients who underwent lung resections in our institution was reviewed from January 2009 to April 2013. Data for patients ≥ 80 years were extracted.

Results:

48 patients aged ≥ 80 underwent lung resection during the 40-month period.

	All (n=48)	VATS (n=25)	Open (n=23)
Mean age (range)	80 (80-87)	82 (80-87)	81 (80-86)
FEV1 % predicted	78.8 \pm 3.6	79.6 \pm 1.0	78.0 \pm 6.1
Ppo FEV1 predicted	67.0 \pm 3.0	68.9 \pm 4.6	65.0 \pm 4.0
Median Thoracscore (range)	4.4 (0.9-17.2)	5.1 (1.4-17.2)	4.4 (0.9-10.7)
Primary NSCLC	44	24	20
Metastatic	2	0	2
Benign	2	1	1
Wedge resections	6	5	1
Segmentectomy	3	1	2
Lobectomy	34	19	15
Complex lobectomy	5	0	5
Drain duration, median (range)		3 (1-12)	4 (2-13)
LOS median (range)		6 (4-42)	11 (4-65)
Actuarial survival	71%	84%	56.5%

25 patients had VATS and 23 had open lung resections (including 11 VATS conversion). The baseline demographics between the 2 groups were equivalent. There was 1 death (4%) in VATS and 2 in open (8.7%). All patients who died had high Thoracscore; 2 had complex lobectomies and one did not tolerate one-lung ventilation peri-operatively. 11 patients were converted to

open; majority due to difficult dissection secondary to adhesions or bleeding from fragile tissues. Drains were removed after a median of 3 (range 1-12) and 4 (range 2-13) days in VATS and open respectively ($p=0.44$). The total length of hospital stay was significantly shorter in patients who had VATS (6 days, range 4-42) compared to open (11 days, range 4-65) ($p=0.02$). At the end of the study period, actuarial survival was 71% (84% in VATS and 56.5% in open).

Conclusions:

Curative lung resections in the very elderly by VATS is associated with good outcome. Complex resections seemed to be tolerated less well by elderly patients, which may be due to fragile tissues. Elderly patients should not be discriminated against surgery based purely on age. Careful selection and individual assessment is required.

Disclosure: No significant relationships.

P-143

PNEUMONECTOMY IN MODERATE AND SEVERE STAGE COPD PATIENTS WITH NON-SMALL CELL LUNG CANCER: IS IT REASONABLE AND SAFE?

Akif Turna, O. Yaksi, A. Demirkaya, E. Ersen, E. Hekimoglu, N. Alizade, K. Kaynak
Department of Thoracic Surgery, Istanbul University Cerrahpasa Medical School, Istanbul, Turkey

Objectives:

Considering the prominent decreases in quality of life after pneumonectomy, most surgeons tend to avoid the indication of pneumonectomy whenever possible. There are guidelines for selection of patients who can undergo pneumonectomy with an acceptable mortality and morbidity. We hypothesized that, patients meeting classification criteria for ‘Moderate and Severe -chronic obstructive pulmonary disease(COPD)’ have similar outcomes compared to patients without ‘mild’ stage COPD

Methods:

Review of prospectively maintained institutional database

Results:

Between January 2002 and May 2012, 88 patients underwent (81 men, 7 women) pneumonectomy for non-small cell lung cancer. Of these, 31(35.2%) met GOLD ‘moderate’(FEV₁/FVC<0.70, 50%≤FEV₁<80%), 6 (6.8%) met ‘severe’ (FEV₁/FVC<0.70, 30%≤FEV₁<50%). There were no difference in gender, biochemical parameters and age between ‘moderate’ COPD patients and patients with ‘mild’ or no COPD. However, mean number smoked cigarette and mean tumor diameter were higher in ‘moderate’ COPD patients (p=0.008 and p=0.026). ‘Moderate’ COPD patients had slightly higher postoperative complication rate than that of patients with mild or no COPD and patients with ‘mild’ or no COPD (any complication: 9/31, 29.0 % vs. 9/51, 17.6%,p=0.175). Patients with moderate-stage COPD experienced higher but statistically insignificant 30-day mortality (5/31, 16.6% vs. 3/51,5.9%, p=0.107). There was no death occurred in patients with severe COPD. Hospital stays were similar between the patients with moderate COPD and patients with mild or no COPD. There were no differences in the incidence of postoperative respiratory failure, bronchopleural fistula, severe dysrhythmia (table). T factor, FVC, additional comorbidity were found to be not predictive factors for morbidity(p>0.05)

Conclusions:

Postoperative outcomes did not differ among patients with moderate COPD and patients with mild or no COPD. Recent algorithms help to override the importance of moderate and severe COPD in order to select correct patients who can undergo pneumonectomy safely

Disclosure: No significant relationships.

P-144

PROGNOSTIC SIGNIFICANCE OF CLINICAL/PATHOLOGICAL STAGE IA NON-SMALL CELL LUNG CANCER

Hirofumi Uehara, Y. Matsuura, M. Nakao, M. Mun, K. Nakagawa, S. Okumura

Thoracic Surgical Oncology, Cancer Institute Hospital, Japanese Foundation for Cancer Research, Tokyo, Japan

Objectives:

Though curative resection is expected in clinical (c-) stage IA/ pathological (p-) stage IA non-small cell lung cancer (NSCLC), recurrence can occur. The aim of this study was to analyze the recurrence-free survival (RFS) of patients with c-stage IA/p-stage IA NSCLC who underwent complete resection.

Methods:

This was a retrospective study of a prospective database from 2005 to 2009 in our institution. A total of 155 patients with NSCLC was staged and resected. Pathologic invasiveness and RFS were compared with clinical factors and radiographic findings, including the tumor dimensions obtained from the thin-section computed tomography (TS-CT) lung window image and the mediastinal window image, maximum standardized uptake values (max SUV) from 18F-fluorodeoxyglucose positron emission tomography (PET) or PET/ CT images, and serum carcinoembryonic antigen (CEA) levels. Using TS-CT images, the tumor shadow disappearance ratio (TDR) (%) was calculated using the following equation: (major tumor dimension on mediastinal image/major tumor dimension on lung image) $\times 100$.

Results:

The median follow-up time was 91 months. The 5-year overall survival (OS) rate was 95% and the RFS rate was 90%. On univariate analysis, males, smokers, high serum CEA levels (>5.0 ng/mL), maxSUV >3.0 , tumor dimension >2 cm in either the pulmonary window image or the mediastinal window image, TDR $<50\%$, and angiolymphatic invasion were associated with significantly worse survival. On multivariate analysis, only tumor dimension in the mediastinal window ($p = 0.047$; hazard ratio, 1.150) and CEA level >5 ng/mL ($p = 0.012$; hazard ratio, 1.446) were independent predictors of survival.

Univariate and multivariate analyses of recurrence-free survival for c-stage IA/p-stage IA NSCLC						
Variable	Univariate			Multivariate		
	Risk ratio	95% CI	p	Risk ratio	95% CI	p
Age (y)						
<65/≥65	0.556	0.202–1.591	0.281			
Sex						
Male/female	2.927	0.996–8.603	0.051			
Smoking index						
>601/≤600	1.003	1.001–1.005	0.003	1.002	0.999–1.004	0.171
Lung window image size						
≥21 mm/<20 mm	1.055	1.000–1.114	0.050	1.038	0.968–1.113	0.301
Mediastinal window image size						
≥21 mm/<20 mm	1.224	1.104–1.358	0.000	1.150	1.002–1.321	0.047
Tumor shadow disappearance ratio						
≥51%/<50%	0.966	0.928–1.006	0.096			
Max SUV						
>3.0/≤2.9	5.600	2.029–15.457	0.001	0.523	0.096–2.858	0.454
CEA						
>5.1/≤5.0	1.671	1.271–2.198	0.000	1.466	1.088–1.975	0.012
Pathology						
AD/non-AD	2.282	1.358–3.833	0.002	2.118	0.912–4.918	0.081
Angiolymphatic invasion						
Yes/No	3.951	1.419–11.001	0.009	1.943	0.480–7.867	0.352
Histological grade						
Poorly-moderately/ well	3.634	1.242–10.637	0.019	1.181	0.233–5.987	0.841

NSCLC = non-small cell lung cancer ;CI = confidence interval; maxSUV = maximum standardized uptake value; CEA =carcinoembryonic antigen; AD, adenocarcinoma

Conclusions:

The important predictors of prognosis in patients with c-stage IA/p-stage IA NSCLC comprise the combination of tumor size in the mediastinal window and the CEA level and each alone, and they should be considered before selecting therapeutic strategies.

Disclosure: No significant relationships.

P-145

VATS LUNG RESECTIONS: CHALLENGING CURRENT FITNESS GUIDELINES

Vasileios Kouritas¹, S.S.S. Begum², V. Tentzeris², R. Milton², N. Chaudhuri²,
K. Papagiannopoulos²

¹Cardiothoracic Surgery, Evangelismos Hospital, Athens, Greece

²Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

Objectives:

The assessment of pulmonary physiology is a key factor when determining a patient's fitness for major lung resection and the amount of lung that can safely be resected. Current guidelines are based on experience from open lung resections. Our aim was to investigate whether the use of VATS, can challenge current guidelines and offer surgical treatment in more patients.

Methods:

The medical records of 308 consecutive patients who underwent VATS lung resection for cancer, over a period of 4 years (2009-2012), were reviewed. Three groups were constructed; Group A: Patients with ppoFEV1 and/or ppoDLCO < 40% of predicted who received higher lung resection than preoperatively planned, Group B: patients with ppoFEV1 and/or ppoDLCO < 40% of predicted who received the planned operation and Group C: patients with ppoFEV1 and ppoDLCO > 40% of predicted who received higher resection than preoperatively planned. Statistical analysis was performed with ANOVA (bonferroni's post-hocs), χ^2 and Mann-Whitney tests.

Results:

64 patients were included in the study (8 patients in group A, 48 patients in group B and 8 patients in group C). Age, gender and BMI between three groups were similar. The main reason for higher resection was a larger than anticipated/wider invasion of the mass. The number of stage II and III patients were similar amongst all groups but Group B had a higher number of stage I patients (p=0.038). Morbidity and mortality were similar across all 3 groups (p=0.393 and 0.717 respectively). The LOS was also similar (p=0.118).

Conclusions:

The use of VATS allowed higher than preoperatively anticipated lung resections to be carried out safely, even in patients with poor pulmonary physiology with no statistically significant increase in morbidity, mortality or length of stay. Although the number of cases analyzed was small, the results challenge current guidelines on assessing fitness of patients undergoing lung resections particularly when collaborative Institutional data gets analyzed.

Disclosure: No significant relationships.

P-146

PROLONGED SURVIVAL AND REDUCED HOSPITAL STAY AFTER VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) SEGMENTECTOMY FOR SMALL LUNG CARCINOMA

Biruta Witte¹, C. Stenz¹, C.F. Vahl², M. Huertgen¹

¹General Thoracic Surgery, Katholisches Klinikum Koblenz-Montabaur, Koblenz, Germany

²Cardiovascular and Thoracic Surgery, Universitätsmedizin Johannes Gutenberg-Universität, Mainz, Germany

Objectives:

To compare the clinical and oncologic outcome of video-assisted thoracoscopic surgery (VATS) access to anterolateral thoracotomy (TT) for clinical stage I lung carcinoma treated by segmentectomy and systematic lymph node dissection.

Methods:

Non-randomized comparative study of prospective institutional registry data and survival data of 100 consecutive patients treated by sublobar anatomical lung resections within one decade (2002 - 2012).

Results:

The VATS group comprised 56, the TT group 44 patients, without significant differences of their demographic, medical, and oncologic baseline data, pre-OP FEV1, involved lobe, tumour diameter, type of resection, and histology. Comparison of clinical results showed for the VATS and TT group operation times of 225 ± 62 min and 195 ± 57 min ($p=0.014$), post-OP hospitalisation of 9 and 12 days ($p=0.034$), complication rates of 32.1 and 34.1% ($p=0.832$), and zero 30d mortality in either group. The VATS group contained 43, the TT group 30 lung cancer patients. The fractions of pathological UICC stages I, II and III were 74.4%, 11.6% and 14% in the VATS group, and 70%, 20% and 10% in the TT group ($p=0.445$). Overall survival was 96.8 and 69.9% at 2 years, and 86 and 69.9% at five years ($p=0.040$), respectively.

Conclusions:

Compared to thoracotomy access, segmentectomy by VATS is associated, at least in our institutional experience, with a 15% increase in median operation time, and a 25% decrease in median hospital stay. Lung cancer patients operated by VATS enjoyed a small but significant overall survival benefit at 2 and 5 years.

Disclosure: No significant relationships.

P-147

PREOPERATIVE PERCUTANEOUS LOCALIZATION FOR THORACOSCOPIC RESECTION OF SMALL PULMONARY NODULES: HOOK WIRE VERSUS RADIO OPAQUE DYE INJECTION

Hye Seon Kim, Y. Hwang, J.H. Jeon, I.K. Park, C.H. Kang, Y.T. Kim

Department of Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Seoul, Korea

Objectives:

A preoperative localization is necessary prior to thoracoscopic resection for pulmonary nodule which is difficult to palpate. Among various localization methods, we compared the efficacy and the safety of two percutaneous localization methods; hook wire insertion and injection of radiopaque dye.

Methods:

From July 2006 to August 2013, 160 pulmonary nodules in 155 consecutive patients who were scheduled to undergo thoracoscopic resection were enrolled. The data on the nodules, the patients and the procedures were collected retrospectively to analyze the efficacy and the safety.

Results:

As preoperative localization, 62 nodules were targeted using hook wire while 98 were marked by injection of radiopaque dye. Thoracoscopic resection was achieved in every nodule. The nodules' average size was 11.74mm in hook wire group(HW) and 11.31mm in radiopaque dye injection group(RD), respectively. The mean distance from the pleura was 10.27mm in HW group while it was 24.34mm in RD group, that the nodules located significantly deeper in RD group($p<0.001$). Localization failure was reported in 11.29% of HW group and 6.12% of RD group, to show no significant difference. Patient's demographic factors were not related to marking failure as well as the characteristics of nodules. Procedure related complications were developed in 33 cases(53.23%) in HW group and 20 cases(20.41%) in RD group, therefore HW group showed higher complication rate($p<0.001$). To eliminate the bias from the nodules' characteristics, we matched two groups using the size and the distance from pleura, to remain 45 cases in each group for analysis. Still the HW group showed tendency to develop complication($p=0.002$).

Conclusions:

Injecting radiopaque dye enables the localization of deeply located nodule, compared to inserting hook wire. Also, radiopaque dye injection showed lower complication rate than hook wire insertion, even in matched analysis. Injection of radiopaque dye might be safer and more effective method in preoperative localization of small pulmonary nodules.

Disclosure: No significant relationships.



P-148

IS LONG TERM OVERALL MORTALITY AFTER LOBECTOMY FOR LUNG CANCER AFFECTED BY THE APPROACH?

Henrik Jessen Hansen¹, L. Laursen¹, L. Konge², T. Jensen³, J. Ravn¹, R.H. Petersen¹

¹*Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark*

²*Centre for Clinical Education, University of Copenhagen and the Capital Region of Denmark, Copenhagen, Denmark*

³*Department of Environmental Medicine, Faculty of Health Sciences, Odense, Denmark*

Objectives:

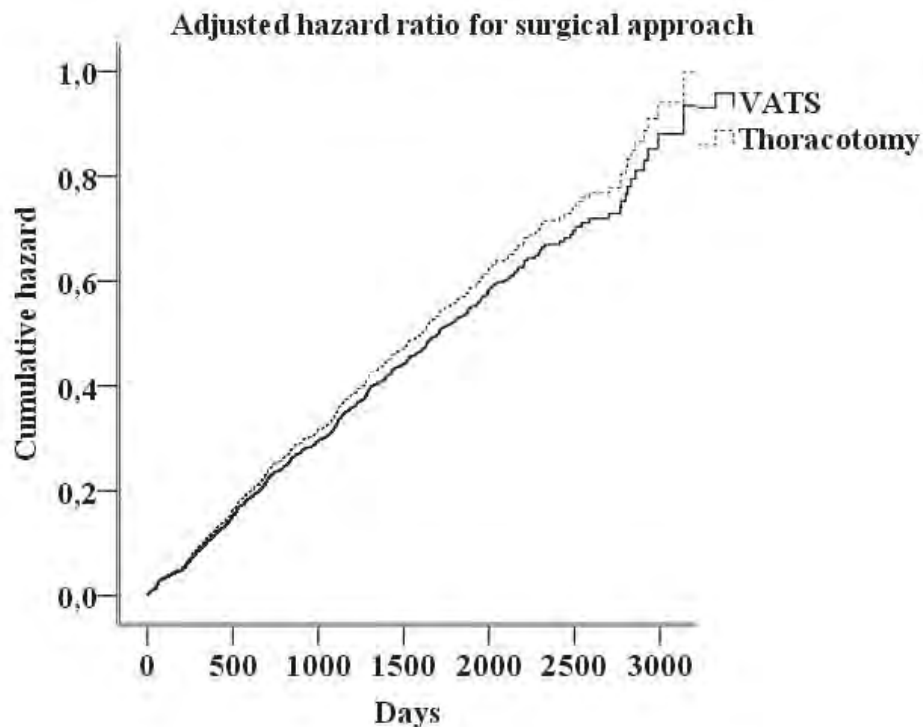
Evidence supports the short term benefits of a Video Assisted Thoracoscopic Surgery (VATS) approach in lobectomy over traditional open thoracotomy. The remaining question is whether the approach affects long term overall mortality after lung cancer surgery as indicated by several meta-analyses.

Methods:

This study is based on a prospectively collected regional centre database including 1339 patients (774 (57.8%) VATS and 565 (42.2%) thoracotomies) who underwent lobectomy or bi-lobectomy for lung cancer from 2005-2011. The open approach was performed as a muscle sparing thoracotomy leaving the latissimus muscle untouched. All patients operated before 2009 were restaged to the 2009 edition of the IASLC lung cancer classification. Data on death until January 3th 2013, type of surgical approach, tumor stage (split into IA, IB, IIA ... IV), modified Charlson comorbidity index excluding age, tumor stage and smoking, FEV1 (per liter), age and sex were used to analyse mortality hazard using Cox multivariate regression analysis.

Results:

Median follow-up was 1200 days (3.3 years) with 275 deaths in the VATS group (35.5%) and 295 in the thoracotomy group (52.2%). In the Cox multivariate regressions analysis the hazard ratio for death among patients with thoracotomy compared to VATS was 1.07 (95% CI 0.90-1.27) after adjustment for cancer stage, Charlson comorbidity index, age, FEV1 and sex. Adjusted hazard ratio for the surgical approach is shown in the figure.

**Conclusions:**

This study indicates that a thoracotomy approach for lobectomy for lung cancer independently increases the mortality with 7%. Although not significant it supports findings in current published meta-analyses. Other factors have higher impact on mortality, but they cannot be changed at the time of surgery or by the surgeon.

Disclosure: H.J. Hansen: Speaker by Covidien

R.H. Petersen: Speaker by Covidien



P-149

CLINICAL FEATURES OF PATIENTS ON HOME OXYGEN THERAPY AFTER SURGICAL RESECTION FOR LUNG CANCER

Takamitsu Banno, K. Suzuki, K. Takamochi, S. Oh

General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

The objective of this study was to clarify the clinical features of patients who need home oxygen therapy (HOT) after surgical resection for lung cancer and the predictor of permanent HOT.

Methods:

A retrospective chart review of 1136 patients who had undergone pulmonary resection for lung cancer and preoperative spirometry about vital capacity (VC), forced expiratory volume in one second (FEV1.0) and diffusing capacity for carbon monoxide (DLCO) between February 2008 and September 2013 was performed. Patients were divided into three groups: Group 1, no need of HOT; Group 2, transient HOT (The patients needed HOT at discharge but leave HOT after that); Group 3, permanent HOT. The Group 1 consisted of 1084 patients (95.4%), and Group 2 consisted of 30 patients (2.6%), and Group 3 consisted of 22 patients (1.9%).

Results:

FEV1.0/FVC, % FEV1.0 and %DLCO were significantly lower in Group 2 and 3 than Group 1 (67.2 vs 73.3%, 82.7 vs 93.2%, 44.1 vs 63.0%, $p<0.001$, respectively). Pack-year index was significantly higher in Group 2 and 3 than Group 1 (1231.8 vs 571.5, $p<0.001$). The cumulative survival at 5 years was 78.4% in Group 1 and 38.7% in Group 2 and 3 ($p<0.001$). %VC, %DLCO and predicted postoperative %DLCO (% PPO DLCO) were significantly lower in Group 3 than Group 2 (82.7 vs 97.1%, $p<0.01$, 36.7 vs 46.0%, $p<0.05$, 26.9 vs 37.8%, $p<0.01$, respectively). The cumulative survival at 5 years of Group 2 was 61.4% and that at 2 years of Group 3 was 21.7% ($p<0.001$). Multivariate analysis reveals that %DLCO and Pack-year index were associated with postoperative HOT (Group 2 and 3), and %VC and % PPO DLCO were associated with permanent HOT (Group 3).

Conclusions:

Preoperative spirometry is useful for identifying those patients at increased risk of HOT after pulmonary resection. In postoperative HOT case, the patients with low %VC or % PPO DLCO tend to need permanent HOT.

Disclosure: No significant relationships.

P-150

RECURRENT TERT PROMOTER MUTATIONS IN NON-SMALL CELL LUNG CANCERS

Xiao Ma¹, R. Wang¹, Y. Pan¹, H. Hu¹, H. Li¹, L. Wang¹, Y. Li², X. Luo¹, Y. Zhang¹, T. Ye¹, Y. Zhang¹, B. Li¹, D. Cai¹, Z. Sun¹, Y. Sun¹, H. Chen¹

¹Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

²Department of Pathology, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

TERT (Telomerase reverse transcriptase) is a ribonucleoprotein polymerase that maintains telomere ends. Mutations in TERT promoter could result in activation of telomerase complex and thus constitute a relevant mechanism for immortalization of cancer cells. Knowledge of the TERT promoter status may be of interest for molecular classification for non-small cell lung cancer(NSCLC). We therefore analyzed the TERT promoter in 449 NSCLCs and identified their clinocapathologic characteristics.

Methods:

A total of 449 frozen surgically resected NSCLC tumor tissues were prospectively collected in the Department of Thoracic Surgery of Fudan University Shanghai Cancer Center. Clinical characteristics including age, sex, smoking status, stage, subtypes of lung adenocarcinoma, relapse-free survival (RFS) and overall survival (OS) were collected. TERT promoter were examined by RT-PCR and direct sequencing.

Results:

Of 449 tumors tested, 12 (2.67%) were found to harbor TERT promoter mutation, 4 with C228T, 2 with C250T, 2 with C216T, 1 each with C229G, C224T, G267C and C295T. Compared to the TERT mutation negative group, patients with TERT promoter mutation were significantly associated with older age ($P=0.042$).

Conclusions:

TERT promoter mutations are recurrently mutated in 2.67% of NSCLCs and are highly enriched in older patients. TERT promoter mutations may play an important role in the pathogenesis of NSCLC and may serve a potential target for therapy.

Disclosure: No significant relationships.



P-151

SOLID COMPONENT AND TUMOR SIZE SIGNIFICANTLY CORRELATE WITH RECURRENCE IN STAGE IB PULMONARY ADENOCARCINOMAJunjie Xi¹, W. Jiang¹, S. Lu², Q. Wang¹¹Department of Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China²Department of Pathology, Zhongshan Hospital, Fudan University, Shanghai, China**Objectives:**

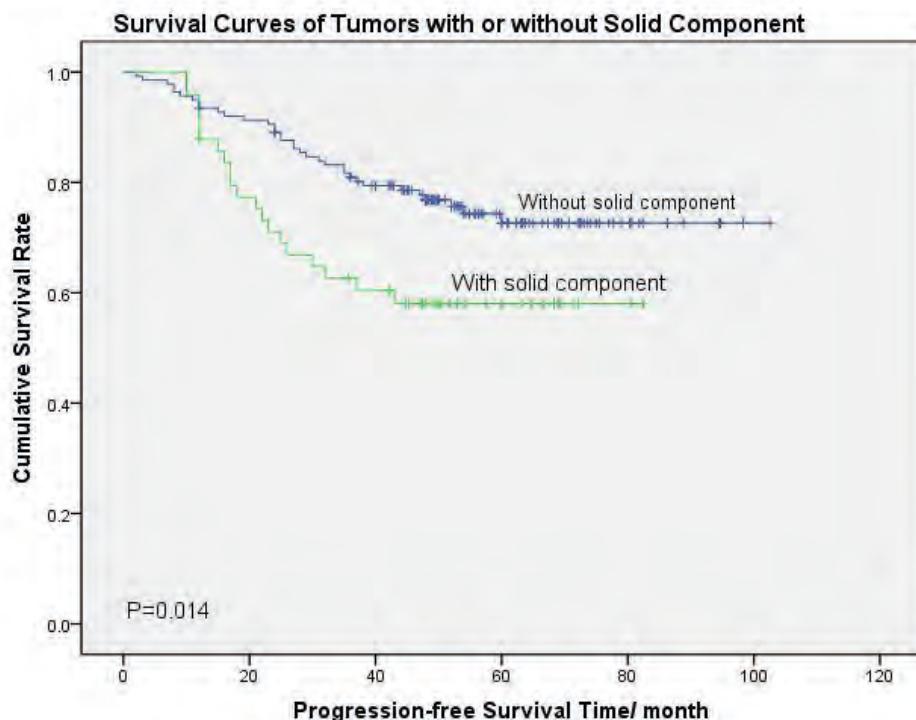
The prognostic factors for stage IB lung cancer remains controversial. The International Association for the Study of Lung Cancer, American Thoracic Society and European Respiratory Society (IASLC/ATS/ERS) proposed a new classification for pulmonary adenocarcinoma. We investigated the prognostic value of this new classification in resected stage IB pulmonary adenocarcinoma.

Methods:

A total of 187 patients with stage IB pulmonary adenocarcinoma from January 2005 to December 2009 were included in the study. All pathological slides were evaluated according to the new classification for pulmonary adenocarcinoma with each histologic component recorded in 5% increments. Survival analyses were performed to determine the prognostic factors for stage IB pulmonary adenocarcinoma.

Results:

Comparing Kaplan-Meier survival curves, two progression-free survival prognostic groups were identified: good prognosis group (lepidic predominant/ acinar predominant/ papillary predominant/ invasive mucinous adenocarcinoma) and poor prognosis group (micropapillary predominant/ solid predominant). The 5-year progression-free survival rates of the two groups were 72.0% and 49.5% ($P=0.042$). The presence of micropapillary component and solid component correlated with progression-free survival rate significantly, with P value of 0.015 and 0.014, respectively. In univariate analysis, tumor size was prognostic for overall survival ($HR=2.083$, $P<0.001$) and progression-free survival ($HR=1.991$, $P<0.001$); gender ($HR=0.558$, $P=0.033$), the new classification ($HR=1.620$, $P=0.047$), the presence of solid component ($HR=1.976$, $P=0.016$) and the presence of micropapillary component ($HR=2.371$, $P=0.018$) were only prognostic for progression-free survival. Multivariate analysis revealed that tumor size was an independent prognostic factor for overall survival ($HR=2.119$, 95%CI: 1.444-3.109, $P<0.001$) and progression-free survival ($HR=1.941$, 95%CI: 1.455-2.589, $P<0.001$), and the presence of solid component ($HR=1.985$, 95%CI: 1.013-3.888, $P=0.046$) was an independent prognostic factor for progression-free survival.

**Conclusions:**

Solid component and tumor size significantly correlate with recurrence in stage IB pulmonary adenocarcinoma. So the recommendation of the novel classification is valuable that each histologic component (lepidic, acinar, papillary, micropapillary, and solid) should be recorded in 5% increments.

Disclosure: No significant relationships.

P-152

SURVIVAL AFTER VATS LOBECTOMY OF N1 POSITIVE NSCLC IS EQUAL TO OPEN RESECTIONFlorian Augustin¹, H. Maier¹, P. Lucciarini¹, M. Fiegl², J. Pratschke¹, T. Schmid¹¹*Department of Visceral, Transplant and Thoracic Surgery, Innsbruck Medical University, Innsbruck, Austria*²*Department of Internal Medicine, Innsbruck Medical University, Innsbruck, Austria***Objectives:**

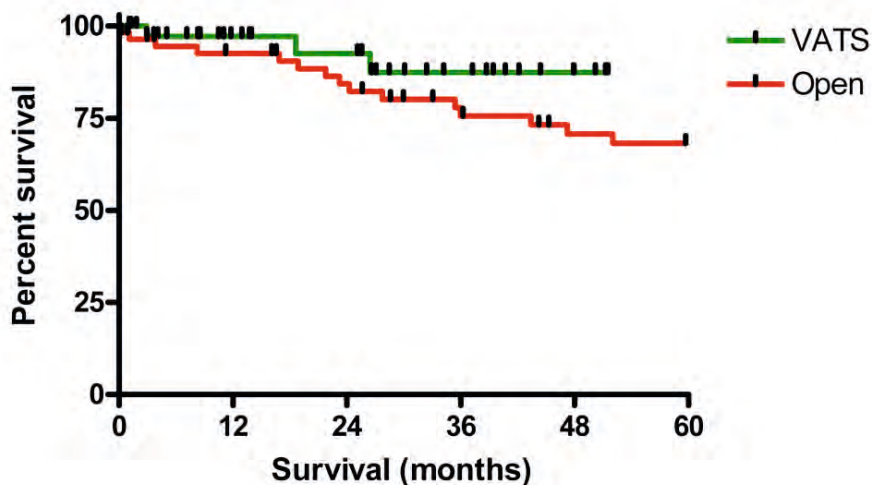
Video-assisted thoracoscopic surgery (VATS) is an accepted alternative to open resection for early stage (nodal negative) non-small cell lung cancer (NSCLC). This study was performed to analyze survival after VATS anatomic resection for nodal positive NSCLC compared to an open approach.

Methods:

The institutional VATS database was searched for pN1 patients after primary surgery for NSCLC (39/301 patients between February 2009 and December 2013). Demographics and survival were compared to a historic group of consecutive N1 positive patients, who underwent open surgery between 2002 and 2006 (57 patients).

Results:

In 21/39 patients, nodal involvement occurred in clinically nodal negative patients. Age (63 vs 61.5 years), gender and stage (UICC IIA vs >IIA) distribution did not differ significantly between the VATS and open group. As treatment protocols have changed over the years, more people received adjuvant therapy after VATS lobectomy (31/39 vs 31/57, $p=0.0164$). Median follow up was 25 months in the VATS group and 45 months in the open group. Disease recurrence occurred in 11/39 and 22/57 patients after a median of 13 and 12 months, respectively. Overall survival did not differ between the two groups (figure 1, log rank, $p=0.2181$). No survival difference was found between clinical nodal negative and preop imaging (PET/CT) nodal positive patients in the VATS group ($p=0.5665$). Figure 1. Survival after VATS and open anatomic resection for N1 positive non-small cell lung cancer $p=0.2181$)

**Conclusions:**

In this study, VATS lobectomy is oncologically equal to open resection. Differences between the survival curves might be explained by a higher rate of adjuvant therapy after VATS lobectomy.

Disclosure: No significant relationships.

P-153

MASSIVE AIR EMBOLISM COMPLICATING PERCUTANEOUS RADIOFREQUENCY ABLATION OF LUNG TUMOUR

Cristian Rapicetta¹, F. Lococo¹, G. Levrini², M. Paci¹, T. Ricchetti¹, G. Sgarbi¹

¹*Unit of Thoracic Surgery, IRCCS-Arcispedale Santa Maria Nuova, Reggio Emilia, Italy*

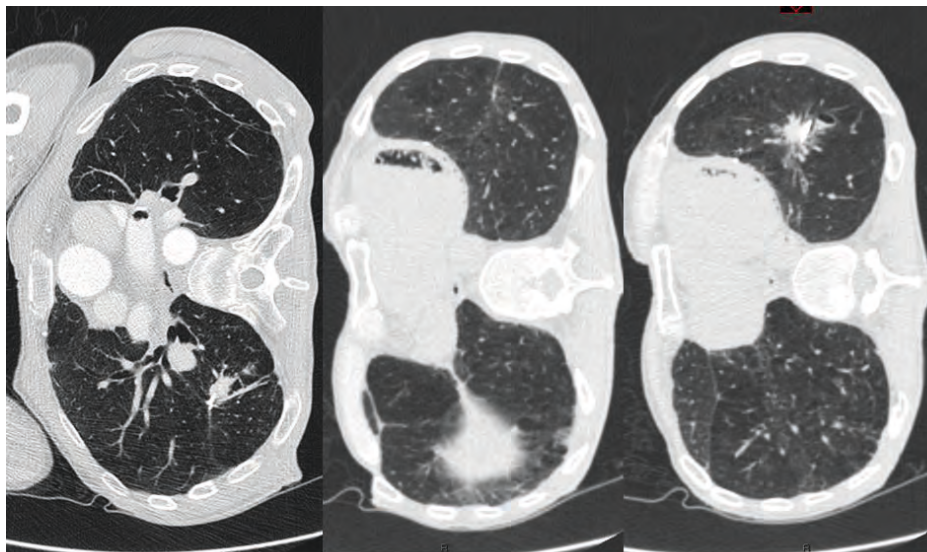
²*Radiology Department, IRCCS-Arcispedale Santa Maria Nuova, Reggio Emilia, Italy*

Objectives:

To report the diagnosis and management of a very rare but serious complication following percutaneous CT-guided Radiofrequency Ablation (RFA) of lung tumour

Case description:

A 71-yr-old man was scheduled for RFA of metachronous lung adenocarcinoma located in left lower lobe. Bilateral multiple lung resections had been previously performed for multicentric adenocarcinomas. Because of poor residual lung function and respiratory comorbidity (COPD Gold stage II), the patient was judged unfit for surgery (FEV1<30% of predicted value). The procedure was performed under sedation (midazolam + fentanyl) and local anaesthesia (lidocaine 2%) in right lateral decubitus. A 17G-straight coaxial catheter was placed under CT-guidance and connected to RF generator. The patient tolerated well the procedure (total heating time: 12 minutes), however, a control CT-scan performed just before catheter removal showed small air blebs in upper pulmonary vein. Trendelenburg position was applied to prevent cephalic embolism, maintaining lateral decubitus. Subsequent scans revealed the migrations of the air blebs to left ventricle and to descending aorta [Fig.1]. No signs of cardiac ischemia were recorded by ECG monitoring. Anti-platelets treatment was started and brain CT-scan was executed to rule out cerebral ischemia. Despite the remarkable amount of air, no signs/symptoms were recorded during the procedure and clinical course was uneventful. The patient was discharge in 4th post-operative day in good healthy conditions.

**Conclusions:**

What is surprising in this challenging case is the absence of relation between the severity of the air embolism and its clinical impact, suggesting that the true incidence of such complication is probably underestimated. Patients who refuse (or are judged not suitable for) lung resection should be adequately informed about such potentially life-threatening complication; radiologists who perform RFA must be confident with diagnosis and management of air embolism. General anesthesia with positive pressure ventilation should be avoided because of it may dramatically increase this phenomenon.

Disclosure: No significant relationships.

P-154

BILOBECTOMY FOR NON-SMALL CELL LUNG CANCER: RESULTS OF A MULTICENTRE STUDY ON 425 CASES

Pier Luigi Filosso¹, S. Welter², O. Rena³, L. Ampollini⁴, D. Siedlecka⁵, J.P. Avaro⁶, M. Anile⁷, S. Margaritora⁸, V. Pischik⁹, P. Thomas¹⁰

¹Thoracic Surgery, University of Torino, Italy, Torino, Italy

²Thoracic Surgery, Ruhrlandklinik, Essen, Germany

³Thoracic Surgery Unit -University of Eastern Piedmont, Azienda Ospedaliera Maggiore della Carità, Novara, Italy

⁴Thoracic Surgery, University of Parma, Parma, Italy

⁵Thoracic Surgery, Medical University of Lublin, Lublin, Poland

⁶Thoracic Surgery, Laveran Military Hospital, Marseille, France

⁷Thoracic Surgery, University of Rome Sapienza, Rome, Italy

⁸Thoracic Surgery, Catholic University of Sacred Heart, Rome, Italy

⁹Hospital Surgery Thoracic Service, Saint Petersburg State University Federal Hospital, Saint Petersburg, Russian Federation

¹⁰Department of Thoracic Surgery, Marseille University Hospital, Marseille, France

Objectives:

Bilobectomy for lung cancer is considered a high-risk procedure with increased morbidity and mortality, as well as with negative impact on overall survival (OS). Aim of this multicenter study is to analyze indications, surgical results and long-term outcome on a large cohort of patients.

Methods:

We retrospectively reviewed patients with lung cancer undergoing bilobectomy between 1995 and 2012. Cumulative survival rates were estimated by the Kaplan-Meier method. Cox proportional hazard model was used in univariate and multivariate analyses to investigate prognostic role of following variable: age, gender, bilobectomy type and indications, postoperative complications, tumor histology and stage.

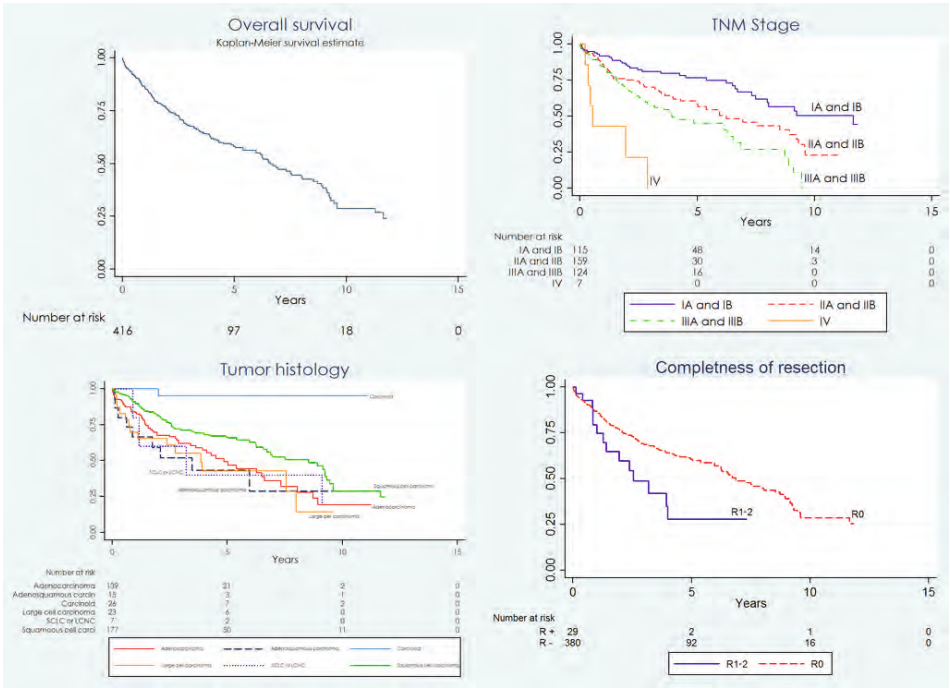
Results:

Four hundred-twenty-six patients (301 males, median age 65 years) received a bilobectomy during the study period. Upper-middle (UMb) and middle-lower (MLb) bilobectomies were performed in 156 and 270 cases, respectively. Indications were: tumor extension across the fissures (166 cases), disease into two lobes (38), vascular invasion (30), bronchial involvement (121) and extrinsic bronchial involvement (70). Major complications (MajCom) (ARDS, pneumonia, bronchopleural fistula, empyema, chylothorax, haemothorax, heart failure, stroke) occurred in 64 cases (15%); minor (MinCom) (atelectasis, incomplete lung re-expansion, prolonged air leak, pleural effusion and atrial fibrillation) in 141 patients (33%). MajCom were associated with: male gender (OR:2.7,P=0.01), presence of comorbidities (OR:2.48,P<0.01) and COPD (OR:2.42,P<0.01). Male gender (OR:1.6,P=0.03) and COPD (OR:1.84,P<0.01) were

associated with MinCom development. 5-year OS was 59% (95%CI:0.53-0.64): age ($P<0.01$), presence of comorbidities ($P=0.01$), completeness of resection ($P=0.03$), histology ($P<0.03$) and tumor stage ($P<0.01$) resulted significant prognostic factors at univariate analyses (Figure 1). Independent survival predictors were: tumor histology (adenocarcinoma, $P=0.05$), stage (II $P=0.01$, III $P<0.01$, IV $P<0.01$), age ($P=0.03$), involvement of bronchus intermedius ($P=0.05$) and completeness of resection ($P=0.03$).

Conclusions:

Bilobectomy is associated with increased morbidity. Five-year survival is influenced by tumor stage and completeness of resection. Worse survival occurs in adenocarcinoma and bronchus intermedius involvement.



Disclosure: No significant relationships.

P-155

ALK, ROS1 AND RET FUSIONS IN 1139 LUNG ADENOCARCINOMAS: A COMPREHENSIVE STUDY OF COMMON AND FUSION PATTERN-SPECIFIC CLINICOPATHOLOGIC, HISTOLOGIC AND CYTOLOGIC FEATURES

Yang Zhang¹, Y. Pan¹, Y. Li², H. Hu¹, L. Wang¹, H. Li¹, R. Wang¹, T. Ye¹, X. Luo¹, Y. Zhang¹, B. Li¹, D. Cai¹, L. Shen², H. Chen¹

¹Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

²Department Of Pathology, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

To have a comprehensive investigation of the clinicopathologic, histologic and cytologic features of fusion-positive lung adenocarcinomas.

Methods:

Quantitative real-time reverse transcriptase PCR (qRT-PCR) and reverse transcriptase PCR (RT-PCR) were simultaneously performed to screen ALK, ROS1 and RET fusions in resected tumor samples from 1139 Chinese lung adenocarcinoma patients, with validation using fluorescent in situ hybridization. Clinicopathologic characteristics, predominant histologic subtype and cytomorphology were assessed in fusion-positive lung adenocarcinomas and compared to those harboring EGFR, KRAS, HER2 or BRAF mutations.

Results:

There were 58 (5.1%) ALK fusions, 11 (1.0%) ROS1 fusions and 15 (1.3%) RET fusions. Tumors with ROS1 fusions had significantly larger diameter than ROS1 fusion-negative tumors ($P = 0.007$), whereas all the 15 tumors harboring RET fusions were ≤ 3 cm in diameter ($P = 0.001$). A significantly lower proportion of ALK-positive lung adenocarcinomas were poorly differentiated, compared to those with ROS1 ($P = 0.019$) or RET ($P = 0.001$) fusions. The three fusion genes were all more prevalent in solid-predominant adenocarcinoma. Compared to fusion-negative lung adenocarcinomas, tumors harboring a fusion gene had significantly higher prevalence of extracellular mucin ($P < 0.001$), cribriform pattern ($P < 0.001$), signet ring cells ($P < 0.001$) and hepatoid cytology ($P < 0.001$). No significant difference in relapse-free survival ($P = 0.147$) and overall survival ($P = 0.444$) was observed between fusion-positive and fusion-negative patients.

Conclusions:

This study showed fusion-positive lung adenocarcinomas had identifiable common and fusion-pattern specific clinicopathologic, histologic and cytologic features, offering implications for fusion genes screening.

Disclosure: No significant relationships.

P-156

EXTRANODAL EXTENSION OF THE REGIONAL NODES IN RESECTED LUNG CANCER – IS IT PREDICTABLE?Hideomi Ichinokawa¹, K. Suzuki², K. Takamochi², S. Oh²¹*General Thoracic Surgery, Juntendo University Shizuoka Hospital, Izunokuni, Japan*²*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

Extranodal extension of the regional nodes would require more aggressive surgery, such as sleeve resection, bilobectomy, and so on. This mode of invasion cannot be diagnosed preoperatively in most patients (Pts) and if preoperative diagnosis is possible, this could be valuable information to decide the indication of surgery. The purpose of this study was to analyze the predictive factors of extranodal extension of the regional nodes in resected lung cancer.

Methods:

Retrospective study was performed on 777 patients with completely resected lung cancer, who had undergone positron emission tomography (PET) - computed tomography (CT) before the operation between 2008 and 2013. Pattern of nodal metastasis and mode of invasion of the regional nodes were investigated. There were 128 (16%) patients with hilar nodal metastasis, and they were divided into two groups, with (n= 46, group A) and without (n=82, group B) extranodal extension of the regional nodes. Other cases (n=649, group C) were used as control. Several clinicopathological factors including PET-CT were investigated for predictors of extranodal invasion of the nodes.

Results:

There were significantly more men, smoker, and Pts with high CEA, big tumor size, high SUV max of the main tumor in group A and B, compared with group C ($p < 0.05$). And bronchial and/or arterial sleeve resection and bilobectomy were performed significantly more in group A compared with B or C ($p < 0.05$). As to predictors of extranodal extension of the regional nodes, there were bigger tumor size, higher SUV max of the main tumor and more positive cases of the hilar lymph node by PET - CT ($p < 0.05$).

	A Groups n = 46 (%)	B Groups n = 82 (%)	C Groups n = 649 (%)	p - Values A + B vs C	A vs B
Age (years)					
Median	66	68	68		
Range	41 - 83	33 - 90	27 - 89	0.30	0.07
Sex					
Male	37 (80)	53 (65)	377 (58)		
Female	9 (20)	29 (35)	272 (42)	< 0.05	0.21
Any Smoking history					
Never smoker	35 (76)	34 (41)	270 (42)		
Smoker	11 (24)	48 (59)	379 (58)	< 0.05	0.055
CEA					
Median	3.9	3.9	2.9		
Range	0.4 - 136	0.2 - 72.6	0.2 - 143	< 0.05	0.81
Tumor size (cm)					
Median	4.0	2.9	2.3		
Range	1.1 - 12	1.2 - 7.7	0.9 - 9.0	< 0.05	< 0.05
Operative procedure					
Lobectomy	0 (0)	82 (100)	611 (94)		
Bilobectomy and Pneumonectomy	17 (37)	0 (0)	14 (2)		
Sleevelectomy (bronchial and/or arterial)	29 (63)	0 (0)	24 (4)	< 0.05 #1	< 0.05 #1
Histological type					
Adenocarcinoma	27 (59)	62 (76)	493 (76)		
The other carcinoma	19 (41)	20 (24)	156 (24)	0.15	0.07
Pathological stage					
I	0 (0)	0 (0)	518 (80)		
II	15 (33)	26 (32)	65 (10)		
III	31 (67)	56 (68)	66 (10)	< 0.05 #2	1 #2
SUV max (the main tumor)					
Median	12.7	7.3	4.8		
Range	2.6 - 22.7	2.3 - 23.0	0.6 - 44.1	< 0.05	< 0.05
Positive cases (the hilar lymph node on PET-CT)	28 (61)	21 (26)	65 (10)	< 0.05	< 0.05

#1: Lobectomy vs Bilobectomy and Pneumonectomy and Sleevelectomy

#2: I vs II and III

Conclusions:

Several predictors were detected for a preoperative diagnosis of extranodal extension of the regional nodes. For those patients, aggressive extended resection could be required and the indication of surgery should be decided based on the assumption.

Disclosure: No significant relationships.

P-157

IMPACT ON SERVICE OF A CHANGE IN OXFORD UNIVERSITY HOSPITALS LUNG CANCER FOLLOW-UP PROTOCOL

E. Teh¹, Jenny Mitchell¹, F. Gleeson², N. Rahman³, E. Black¹, E. Belcher¹

¹*Thoracic Surgery, Oxford University Hospitals NHS Trust, Oxford, United Kingdom*

²*Department Of Radiology, Oxford University Hospitals NHS Trust, Oxford, United Kingdom*

³*Oxford Centre for Respiratory Medicine, Oxford University Hospitals NHS Trust, Oxford, United Kingdom*

Objectives:

The ideal follow-up for lung cancer patients is uncertain. Chest radiograph (CXR) protocols are of doubtful benefit in detecting tumours at a stage where intervention may influence outcome. CT follow-up is attractive in the era of modern imaging. However, the impact of such a change in service provision is uncertain.

Methods:

The Oxford Univeristy Hospitals lung cancer follow-up protocol was amended from a CXR-based protocol to CT-based as shown in the Table 1 below from May 2013. Identified radiological abnormalities were discussed at multi-disciplinary meeting (MDT) and interventions or further imaging determined. A prospective database was compiled to facilitate review of impact of change.

Pre-May 2013 protocol	May 2013 onwards protocol
CXR 3 monthly for 2 years	CT 6 months
CXR 6 monthly between years 2 and 5	CXR 1 year
	CT 18 months
	CXR years 2, 3 and 5
	CT 4 years

Results:

62 patients underwent follow-up based on the amended protocol following lung resections between August 2009 - September 2013. Pathologic staging of the patients was T1 (n=33), T2 (n=21), T3 (n=6) and T4 (n=2). There were 4 patients with pN1 and 4 patients with pN2 disease. The cancers consisted of adenocarcinoma (n=35), squamous (n=16) and others (n=11). There were 6 patients (9.7%) with abnormal scans. One patient was found to have a new lesion in the contralateral lung and was referred for stereotactic radiotherapy based on radiological diagnosis of synchronous or metachronous malignancy. 2 patients underwent further invasive investigations which showed no evidence of disease relapse. The remaining 3 patients underwent further follow-up CT at an earlier interval.

Conclusions:

Since the change in follow-up protocol, 6 (9.7%) patients required re-discussion at Lung MDT



for abnormal CT scans. The impact of change in lung cancer follow-up protocol from CXR to CT resulted in increased burden of work at MDT. The change in follow-up facilitated the early diagnosis of lung cancer in 1 patient, however resulted in invasive procedures in other patients without recurrence or new disease. Long-term follow-up will be required to determine the risks and benefits of CT follow-up.

Disclosure: No significant relationships.

P-158

VARIATION OF MEDIASTINAL LYMPH NODE SAMPLING IN LUNG CANCER RESECTION BETWEEN THORACIC AND CARDIOTHORACIC SURGEONS. A RETROSPECTIVE ANALYSIS FROM A SINGLE UK CENTREAkshay Patel, I. Hunt*Thoracic Surgery, St. George's Hospital, London, United Kingdom***Objectives:**

The current trial data concludes that systematic lymph node dissection in radical lung cancer resection surgery is recognised as the optimal surgical technique to improve patient outcome post-operatively. We investigate the compliance to the current guidance, as outlined in the British Thoracic Society (BTS) 2010 guidelines, between thoracic and cardiothoracic surgeons in a single UK centre.

Methods:

A retrospective study was carried out on 100 patients who underwent complete resection from 2010 onwards. The pathological specimen reports for each patient were analysed to ascertain a) the total number of lymph nodes sampled and b) of those nodes sampled, how many were mediastinal stations and how many were N1 stations. The results were compared between those patients who were under a thoracic consultant and those who were under a cardiothoracic consultant.

Results:

Of 50 patients in each of the thoracic and cardiothoracic surgical cohorts; the average number of mediastinal nodes sampled was 3.32 and 3.18 respectively, and the average number of N1 stations sampled was 3.36 and 2.84 respectively. The rate of mediastinal lymph node sampling conforming to the BTS guidelines (i.e. at least 3 stations sampled) in the thoracic and cardiothoracic groups was 46% and 26% respectively. Similarly the rate of N1 station sampling (i.e. at least 3 stations sampled) was 76% and 62% respectively.

Conclusions:

Systematic lymph node dissection as delineated by the BTS guidance is better conformed to within the dedicated thoracic surgical cohort as opposed to the cardiothoracic surgical cohort.

Disclosure: No significant relationships.

P-159

RATIO BETWEEN MAXIMUM STANDARD UPTAKE VALUE OF N1 LYMPH NODES AND PRIMARY LUNG TUMOUR PREDICTS N2 DISEASE IN PATIENTS OPERATED ON NON-SMALL CELL LUNG CANCER

Antonio Francisco Honguero Martínez¹, M.D. García Jiménez¹, A. García Vicente², J. López-Torres Hidalgo³, Á.M. Soriano Castrejón², P. León Atance¹

¹Thoracic Surgery, University General Hospital of Albacete, Albacete, Spain

²Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

³Primary Health Center, University General Hospital of Albacete, Albacete, Spain

Objectives:

F-18 fluorodeoxyglucose integrated PET-CT scan is commonly used in the work-up of lung cancer to improve preoperative disease stage. We analysed the ratio between maxSUV of N1 lymph nodes and primary lung cancer to mediastinal (N2) disease after surgical resection.

Methods:

This is a retrospective study of a prospective database. Patients operated on NSCLC with N1 disease by PET-CT scan were included. None of them had previous induction treatment, but they underwent standard surgical resection plus systematic lymphadenectomy.

Results:

There were 51 patients with FDG-PET-CT scan N1 disease. 44(86.3%) patients were male with a mean age of 64.1±10.8 years. Type of resection: pneumonectomy=4(7.9%), lobectomy/bilobectomy=44(86.2%), segmentectomy=3(5.9%). Histology: adenocarcinoma=26(51.0%), squamous=23(45.1%), adenosquamous=2(3.9%). Lymph nodes after surgical resection: N0=21(41.2%), N1=12(23.5%), N2=18(35.3%). Mean ratio of the maxSUV of N1 lymph node to the maxSUV of the primary lung tumour was 0.60 (range 0.08-2.80). N2 disease had a mean ratio of 0.83 (range 0.18-2.70), whereas N0/N1 disease had a mean ratio of 0.48 (range 0.08-2.80), differences statistically significant (p=0.029). The optimal value of the ratio with a maximized sensibility (77.8%) and specificity (69.7%) in the receiver operating characteristics curve was 0.46 or greater.

Conclusions:

The ratio of the maxSUV of N1 lymph node to the maxSUV of the primary tumour in NSCLC patients correlates with mediastinal lymph node metastasis (N2 disease) after surgical resection. When the ratio is 0.46 or greater, there is a 77.8% chance of mediastinal lymph node metastasis. In these cases, mediastinal lymph node biopsy should be performed to diagnose preoperative N2 disease.

Disclosure: No significant relationships.

P-160

TIME TRENDS AND RELATION OF STAGE AND TUMOR SIZE AT DIAGNOSIS IN LUNG CANCER - A SEER DATABASE ANALYSIS WITH 450,280 PATIENTSAttila Dubecz¹, M. Schweigert², N. Solymosi³, H.J. Stein¹¹*Department of General and Thoracic Surgery, Klinikum Nuremberg, Nuremberg, Germany*²*Department of General and Thoracic Surgery, Klinikum Neumarkt i.d.OPf., Neumarkt i.d.OPf., Germany*³*Faculty of Science, Szent István University, Budapest, Hungary***Objectives:**

Due to rapid evolution of imaging tools we are able to detect tumors at a smaller size, which should result in an increase in the incidence of early cancer and a decrease in the rate of cancer presenting at a late stage. Our objective was to evaluate the recent trends of tumor size at diagnosis and the incidence of early and advanced disease in lung cancer and to assess the relationship of tumor size and stage in a population based sample.

Methods:

Using the Surveillance Epidemiology and End Results Database (1997–2010), a total of 450,280 patients with histologically proven lung cancer were identified. Tumor size at diagnosis and incidence of early stage and advanced disease were assessed and trended over the study period.

Results:

Median size of tumors at diagnosis decreased from 40 to 35 mm and the incidence of early stage and advanced disease decreased through the study period (97–79 / 100,000 and 413–296 / 100,000, respectively). Median tumor size at diagnosis decreased slightly in females (from 35 mm to 33 mm) and whites (from 40 mm to 35 mm), and remained essentially the same in males and non-whites between 1988–2010. Percentage of patients diagnosed with a tumor <10mm remained under 5% even in 2010. Fifty-six percent of patients diagnosed with lung cancer smaller than 10mm had early stage disease. Eighty-five percent of patients diagnosed with lung cancer smaller than 10mm had node negative disease.

Conclusions:

Tumor-size correlates with lymph node status and the distribution of stages in lung cancer: smaller lesions represent earlier stage disease. There is a significant recent decrease in the incidence of advanced disease which is probably not caused by the observed decrease in tumor size at diagnosis since a similar reduction in the early cases was observed as well.

Disclosure: No significant relationships.

P-161

PLEURAL FACTOR AND NODAL METASTASIS IN SMALL-SIZED LUNG ADENOCARCINOMA

Takekazu Iwata, H. Suzuki, T. Nakajima, K. Nagato, Y. Yamada, T. Tagawa, T. Mizobuchi, S. Yoshida, I. Yoshino

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

Objectives:

Clinical trials to prove non-inferiority of sublobar resection for small sized (≤ 2 cm) lung adenocarcinoma is on going in Japan and the United States. Both protocols (JCOG0802/WJOG4607L and CALGB-140503) set the eligibility criteria as peripheral nodules ≤ 2 cm including p11 cases. However, UICC7, which was established later, ranked up p11 from T1 to T2a. The prognostic influence of pleural factor in small adenocarcinoma has not been well studied. We tried to clarify the significance of pleural factor in adenocarcinoma ≤ 2 cm.

Methods:

A retrospective chart review of 2354 cases with lung cancer resected in a single institute from January 1990 to December 2012 was performed. We selected the cases with adenocarcinoma ≤ 2 cm, p10-2, T1a/T2a of UICC7. T2a judged by non-pleural factor were excluded. Data of 478 selected cases were used for this retrospective study.

Results:

251 male and 227 female, aged 63.4 ± 0.4 year old were included. As for pathologic stage, 402 IA, 19 IB, 24 IIA, 23 IIIA, 3 IIIB, and 4 IV were included. As for pleural factor, 408 p10, 57 p11, and 13 p12 were included. The incidence of the nodal metastasis was significantly higher in the p11 and p12 cases (16.1% and 50.0% respectively) comparing to p10 cases (9.4%, $p=0.0001$). 75% of the nodal metastasis cases were cN0 cases. As for 5-year survival, p10 cases were significantly better than p11/2 (91.8% vs. 79.2%, $p<0.0001$). Limiting in N0M0 cases, 5-year survival showed no difference but 10-year survival of p10 cases were significantly better (86.9% vs. 72.3%, $p<0.05$).

Conclusions:

Positive pleural factor is a risk for nodal metastasis and poor postoperative prognosis. In the cases with adenocarcinoma ≤ 2 cm suspected for pleural invasion, indication of limited surgery should be considered carefully. Development of pre/intraoperative pleural diagnosis method is also required.

Disclosure: No significant relationships.

P-162

ISSUBLOBARRESECTION APPROPRIATE FOR SURGICAL MANAGEMENT OF CLINICAL STAGE IA PURE-SOLID LUNG CANCER?Aritoshi Hattori, K. Suzuki, K. Takamochi, S. Oh*General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan***Objectives:**

Phase III trial as to the feasibility of sublobar resection for small-sized lung cancer is now ongoing in Japan. But radiologically pure-solid lung cancers are considered to be invasive with a high incidence of locoregional recurrence even in pathological-N0 status.

Methods:

We examined surgically resected 275 c-stage IA lung cancer patients with radiologically pure-solid appearances based on thin-section CT scan. The findings obtained by preoperative thin-section CT were reviewed and SUVmax on PET was recorded for all. The patients with pathologically PL0, Ly0, V0 and N0 were defined as non-invasive pure-solid lung cancer (NIPS), whereas the others were invasive one (IPS).

Results:

While nodal involvement was observed in 62 (23%) patients with c-stage IA pure-solid lung cancer, 77 (28%) patients pathologically showed NIPS. The overall survival (OS) and recurrence-free survival (RFS) were significantly different between patients with NIPS (5-year OS, 95.3%; 5-year RFS, 87.9%) and IPS (5-year OS, 75.2%, $p=0.0264$; 5-year RFS, 62.4%, $p=0.0004$). Multivariate analysis elucidated that air bronchogram ($p=0.0328$), c-T1a ($p=0.0041$) and SUVmax ($p=0.0002$) were significant clinical predictors of NIPS. When these clinical predictors were combined and classified as favorable patients, the frequency of nodal involvement was 4% of favorable patients in c-stage IA pure-solid lung cancer. Furthermore, 5-year OS and RFS of favorable patients were both 100% even in c-stage IA pure-solid lung cancer despite their operative modes. In contrast, 5-year OS and RFS were 74.1% and 63.0% even in c-stage IA disease, if patients had neither of these clinical predictors.

Conclusions:

Tumor size, presence of air bronchogram and SUVmax level were the significant predictors of pathological non-invasive status, and these clinical predictors could be useful for adopting sublobar resection even in patients with pure-solid lung cancer. In contrast, sublobar resection for pure-solid lesions without any favorable factors should be carefully indicated because of their high potential of cancer recurrence.

Disclosure: No significant relationships.

P-163

IMPACT OF ROUTINE PREOPERATIVE PET-CT (VERSUS CT) ON DEVELOPMENT OF POSTOPERATIVE DISTANT METASTASES IN SURGICALLY TREATED NSCLC PATIENTS

Tanel Laisaar¹, I. Almre², B. Sarana¹, T. Vanakesa², M. Raag³

¹Thoracic Surgery, Tartu University Hospital, Tartu, Estonia

²Thoracic Surgery, North Estonian Regional Hospital, Tallinn, Estonia

³Department of Public Health, Tartu University, Tartu, Estonia

Objectives:

Major role of preoperative PET-CT in cancer patients is to detect asymptomatic distant metastases i.e. avoid surgical approach in stage IV. In recent years PET-CT has become routine in several centers, while remained occasional in others. The aim of our study was to compare the occurrence of postoperative distant metastases and early mortality in two thoracic surgery centers differing in PET-CT use: in center A preoperative PET-CT was routinely performed, in center B it was not included in preoperative workup.

Methods:

All surgically treated NSCLC patients from both centers from July 2011 to June 2013 were included. Patients were followed up until end of December 2013. Data were obtained from electronic case reports and a death registry. Logrank, Fisher's, chi-squared, and t-tests were used to compare the groups.

Results:

Altogether 89 patients (62 male and 27 female; age range 45 to 84 years) from center A and 82 patients (61 male and 21 female; age range 39 to 89 years) from center B were included. Patients with synchronous cancers and those who died during hospital stay were excluded. There was no statistically significant difference between the two centers in patients' age and sex, cancer morphology, and postoperative cancer stage. Type of operation was more commonly segmentectomy/wedge resection in center B (20%) versus center A (6%) and lobectomy in center A (85%) versus center B (71%) ($p=0.019$). Seventeen patients (19%) in center A and 11 patients (13%) in center B developed distant metastases ($p=0.425$); 12 patients (13%) and 14 patients (17%) died, respectively ($p=0.660$); time to death did not differ ($p=0.612$). In both centers brain metastases were the most frequent: in 6 and 4 cases, respectively ($p>0.990$).

Conclusions:

Preoperative PET-CT as part of routine preoperative workup did not result in reduction of postoperative distant metastases occurrence and early mortality in surgically treated NSCLC patients.

Disclosure: No significant relationships.

P-164

ROLE OF HISTOLOGICAL DIAGNOSIS IN DEFINITIVE LUNG RESECTION - TO DO OR NOT TO DO?S. Ghosh, Lakshmi Srinivasan*Cardiothoracic Surgery, University Hospital North Staffordshire, Stoke on Trent, United Kingdom***Objectives:**

The standard practice in lung cancer surgery is to obtain tissue diagnosis prior to definitive lung resection. This often delays definitive surgery. The study was undertaken to establish the feasibility and efficacy of performing definitive lung resections without prior histology.

Methods:

279 patients underwent definitive lung resection by a single surgeon between January 2011 to January 2014. Of these, 249 patients underwent resection without any pre or per operative histology. The rest had histology available obtained either pre or per-operatively, before definitive resection. The post operative histopathology was then studied for appropriateness of the procedures undertaken. All data was collected prospectively from the hospital Dendrite PACS and ICM systems.

Results:

All patients were worked up with PET-CT. Of the 249 patients studied, mean age was 69.6 years, 156 were males and 85% had smoking history. Of these, 246 patients (98.7%) were found to have lung cancer on post operative histopathology; 242 had non small cell, 2 small cell and 2 mixed non-small cell and small cell cancer. 3 patients had a benign pathology; tuberculoma, pulmonary infarction and aspergilloma. We found that a Standardized Uptake Value (SUV) on PET of more than 3 was a strong predictor of malignancy.

Conclusions:

We have clearly demonstrated that obtaining a histological diagnosis, either prior to surgery or during surgery, by means of frozen section, is not mandatory or detrimental to patient outcome. On the other hand, in health systems such as in the UK, where time from presentation to definitive treatment of lung cancer is limited and funding is performance based, spending time on pursuing tissue diagnosis preoperatively places undue strain on the resources. However, it is mandatory to have an experienced team of radiologists and surgeon with strict radiological and intra-operative criteria to be able to make the right decision during surgery.

Disclosure: No significant relationships.



P-165

SUBXYPHOID UNI-PORT VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR PULMONARY METASTASECTOMY

Wei Cheng Lin¹, C.C. Liu², C.H. Shih², Y.C. Chang¹

¹*Division of Thoracic Surgery, Department of Surgery, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan*

²*Surgery, Koo Foundation Sun Yat-Sen Cancer Center, Taipei, Taiwan*

Objectives:

To report our experience of subxyphoid uniport video-assisted thoracoscopic surgery for pulmonary metastasectomy.

Methods:

In December 2013, 4 patients with pulmonary metastasis underwent our subxyphoid uniport VATS for metastasectomy. Three cases underwent bilateral pulmonary metastasectomy. The metastases originated from hepatocellular carcinoma, nasopharyngeal carcinoma, colon adenocarcinoma, and breast cancer. After general anesthesia with double-lumen ventilation, the patients were placed in supine position for bilateral disease and in semi-decubitus position for unilateral case. The incision was made at subxyphoid area and about 3.5cm in length. After blunt dissection by finger to create retrosternal space and to enter bilateral pleural cavity, the low sternum was elevated slightly by automatic surgical retractor system. One 2.5-6cm wound protector was applied as the port. We used 10mm endoscope with adjustable viewing direction, and both thoracoscopic and laparoscopic surgery instruments to perform wedge resection or lobectomy.

**Results:**

Two lobectomy (one right middle lobe, one right lower lobe) and 8 wedge resections (3 in left upper lobe, 3 in right lower lobe, and 2 in left lower lobe) were done in these four cases. Totally 13 metastatic lesions was resected with free resection margin. The size of lung lesions ranged from 0.6 to 1.5cm. The mean operative time were 174 minutes (range:105-230) with mean blood loss of 45ml (range:10-100). The chest tube was removed averagely 2.5 days (range:2-3) after operation, and the mean post-operative hospital stay was 4.25 days (range:3-6). The average score of Visual Analogue Scale for pain was 1.5 on first post-operative day, and reached zero two days after operation. No complication was noted in these four cases.

Conclusions:

Subxyphoid uniport VATS for bilateral pulmonary metastasectomy is feasible, even to perform lobectomy, and it does provide minimal post-operative pain and short hospital stay.

Disclosure: No significant relationships.

P-166

PROGNOSTIC VALUE OF THE IASLC/ATS/ERS CLASSIFICATION OF LUNG ADENOCARCINOMA IN RESECTED STAGE I DISEASE IN PURE CAUCASIAN PATIENTS

Ottavio Rena¹, P. Santos Pereira², R. Boldorini², G. Baietto¹, A. Roncon¹, E. Papalia¹, F. Massera¹, D. Turello¹, F. Davoli¹, C. Casadio¹

¹Thoracic Surgery Unit -University of Eastern Piedmont, Azienda Ospedaliera Maggiore della Carità, Novara, Italy

²Pathology Department - University of Eastern Piedmont, Azienda Ospedaliera Maggiore della Carità, Novara, Italy

Objectives:

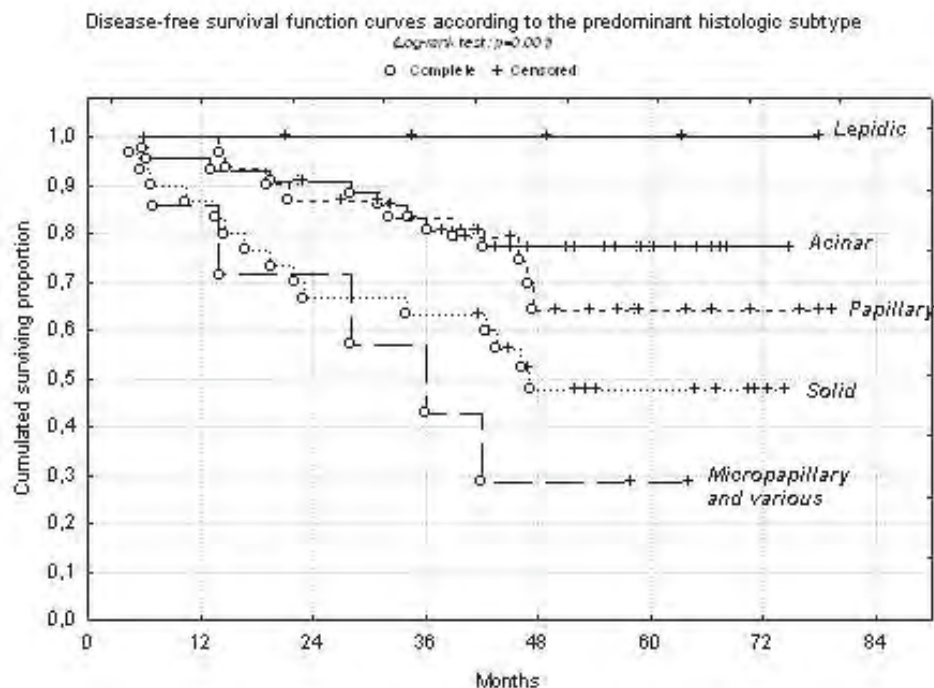
To investigate the prognostic value of the International Association for the Study of Lung Cancer (IASLC)/ American Thoracic Society (ATS)/ European Respiratory Society (ERS) international multidisciplinary lung adenocarcinoma classification in stage I resected Caucasian patients.

Methods:

We identified 146 consecutive patients with pathological stage I lung adenocarcinoma submitted to lobectomy and mediastinal lymph-nodes dissection between 2006 and 2010. No patients had preoperative treatments. Histological subtypes were classified according to the IASLC/ATS/ERS lung adenocarcinoma classification. Patient's 5-years overall survival (OS) and disease-free survival (DFS) were calculated. Survival was assessed on December 2013.

Results:

Among 146 patients, 1 minimally invasive adenocarcinoma (MIA) (0.6%), and 145 invasive adenocarcinoma (IVA) (99.4%) were detected; IVA were 6 lepidic predominant (4%), 57 acinar predominant (39%), 39 papillary predominant (26%), 37 solid predominant (25%), 5 micropapillary predominant (3%), 2 invasive mucinous (1.5%) subtype, respectively. Mean follow-up was 46 months (range 6-79). The 5-years DFS and OS for the entire series were 64% and 75%, respectively. According to the histological subtypes the 5-year DFS (Graph 1) and OS were 100% and 100% for MIA and lepidic, 77% and 88% for acinar, 63% and 77% for papillary, 48% and 55% for solid, 28% and 43% for micropapillary and invasive mucinous adenocarcinoma, respectively. Significant differences were recorded when histological subtype survivals were compared ($P < 0.05$)



Conclusions:

MIA and lepidic predominant represent a limited proportion of adenocarcinoma subtypes in Caucasian patients (5%), whereas 30% of cases are constituted by highly aggressive subtypes as solid, micropapillary and invasive mucinous adenocarcinoma. The different histological subtypes significantly correlate with long-term outcome. The constitution of lung adenocarcinoma series in terms of tumour subtypes should be kept in mind when comparing results of lung cancer treatment from different populations.

Disclosure: No significant relationships.

P-167

DETECTION AND CHARACTERIZATION OF CIRCULATING TUMOR CELLS IN RESECTABLE NON-SMALL-CELL LUNG CARCINOMA. PRELIMINARY RESULTS

Clara Isabel Bayarri Lara¹, M.J. Serrano², C.F. Giraldo¹, F.G. Ortega², J. Ruiz Zafra¹, A. Sanchez Palencia¹, F. Quero¹, J.L. Garcia Puche³, J.A. Navajas¹, A. Cueto¹

¹*Department of Thoracic Surgery, Virgen de las Nieves University Hospital, Granada, Spain*

²*Biodynamics of Circulating Tumor Cell, Pfizer-University of Granada Center of Genomics and Oncology (GENyO), Granada, Spain*

³*Oncology, San Cecilio University Hospital, Granada, Spain*

Objectives:

Even in early stage non-small cell lung carcinoma (NSCLC) a considerable percentage of patients will develop metastases after surgical treatment. Such metastases may arise from dissemination of circulating tumor cells (CTCs) present in the patient's blood at the time of surgery. This study investigates whether CTCs are detectable in patients with resectable NSCLC before and after surgical resection, and their clinical and prognostic utility. We present our preliminary results.

Methods:

36 patients undergoing radical surgery for previously, untreated NSCLC were evaluated. Blood samples for CTC analysis were obtained before and one month after surgery. CTCs were isolated by immunomagnetic techniques using magnetic beads labelled with a multi-CK-specific antibody (CK3-11D5). In addition epidermal growth factor receptor (EGFR) positive cells were identified by immunofluorescence assays.

Results:

We performed 24 lobectomies, 2 bilobectomies, 6 pneumonectomies and 4 segmentectomies. The final pathologic stages were I 18, II 13, III 5. The presence of CTCs was confirmed in 24 patients (66.7%) before surgery (mean of 3 CTCs per 10 ml of blood) and in 15 patients (41.7%) after surgical resection (mean of 2 CTCs per 10 ml). We observed a significant decrease in CTCs count after pneumonectomy ($p=0.001$). No significant correlation was found with age, gender, histology or stage. Double-staining experiments with pan-CK and EGFR antibodies revealed strong Ck+/EGFR+ specific immunofluorescence in 22 of 24 (91.7%) at baseline. Additionally, heterogeneity for EGFR expression was found in 90% of the Ck+/EGFR+ CTC cases. Five patients (13.9%) developed an early distant recurrence (2 stage I, 2 stage II, 1 stage III) all of them showed CTC EGFR+ presence ($p=0.02$).

Conclusions:

CTCs are detectable in patients with resectable NSCLC. Results suggest potential clinical utilities of CTCs detection and characterization. A broader study necessary for further validation of prognostic significance of CTCs is currently being performed.

Disclosure: No significant relationships.

P-168

CLINICAL FEATURES OF SURGICALLY RESECTED ADENOCARCINOMA WITH MICROPAPILLARY AND SOLID COMPONENT IN NON-SMALL CELL LUNG CANCER

Masaya Okuda, J. Nakano, N. Matsuura, Y. Kasai, M. Gotoh, T. Go, H. Yokomise
General Thoracic, Breast and Endocrinological Surgery, Kagawa University, Miki-cho, Japan

Objectives:

Histopathological evidence of a micropapillary or solid pattern in lung adenocarcinoma is known to be a feature indicative of poor prognosis. The aim of this study was to investigate clinical survival feature of surgically resected adenocarcinoma with micropapillary or solid component.

Methods:

The study candidates were 656 consecutive patients with lung adenocarcinoma who underwent pulmonary resection between April 1999 and December 2011 at our hospital. Overall survival was evaluated in relation to the histologic subtype (adenocarcinoma with a micropapillary component, adenocarcinoma with a solid component, or other adenocarcinoma types).

Results:

Fifty-four patients were excluded because they received neoadjuvant therapy. All patients were Japanese and 290 of them were female. The pathological diagnosis was stage I in 499 patients, stage II in 41, stage III in 41, and stage IV in 21. Within a median follow-up period of 47.4 months (range 0.3-159.9 months), 94 of the 602 evaluated patients died. Among them, 40 had tumors with a solid component, 37 had tumors with a micropapillary component, and 10 had tumors with micropapillary and solid components. Although the presence of a micropapillary or solid component impacted negatively on patient survival, irrespective of pathological stage (solid, OR 1.90, $p=.045$; micropapillary, OR 2.43, $p=.004$), neither component was a significant risk factor at stages over II (solid, OR 0.83, $p=.651$; micropapillary, OR 0.55, $p=.214$). For stage I adenocarcinoma, presence of a micropapillary component was the only significant risk factor, with or without adenocarcinoma in situ (AIS) (micropapillary with AIS, OR 5.62, $p<.001$; micropapillary without AIS, OR 4.76, $p<.001$).

Conclusions:

The presence of a micropapillary component in resected specimens of adenocarcinoma is a feature suggestive of poor prognosis at pathological stage I, but the presence of a micropapillary or solid component is not significantly predictive of outcome at stages over II.

Disclosure: No significant relationships.

P-169

SIGNIFICANCE OF THE PRESENCE OF MICROSCOPIC VASCULAR INVASION AFTER COMPLETE RESECTION OF NON-SMALL CELL LUNG CANCER

Yoshikane Yamauchi, N. Miyata, H. Kojima, M. Nagata, T. Maniwa, S. Takahashi, M. Isaka, Y. Ohde

Division of Thoracic Surgery, Shizuoka Cancer Center, Nagaizumi, Japan

Objectives:

The aim of this study was to assess the significance of microscopic vascular invasion (MVI) in a population of completely resected patients with non-small cell lung cancer (NSCLC), along with an analysis of impact of the MVI and clinicopathological factors on recurrence and survival.

Methods:

From September 2002 to December 2010, 1230 patients with NSCLC received complete resection at our institution. MVI was ascertained using histopathological and immunohistochemical techniques. Overall survival (OS) and disease-free survival (DFS) were estimated using the Kaplan–Meier method. We performed multivariate analyses to determine the independent prognostic factors.

Results:

MVI was observed in 448 patients (36.4%). Prevalence of MVI was lower in Stage I cases than in higher stage cases ($p < 0.001$). The presence of MVI was associated with DFS ($p < 0.001$, 3-yr DFS: 87.1% in MVI-positive vs 64.3% in MVI-negative) and with OS ($p < 0.001$). Especially in Stage IB patients, who often receive oral anticancer agents as adjuvant chemotherapy in our institution, the presence of MVI was associated with DFS ($p < 0.001$, 3-yr DFS: 85.4% in MVI-positive vs 69.3% in MVI-negative) and with OS ($p = 0.039$). In a multivariate survival analysis, The significant indicator of poor DFS was MVI ($p < 0.001$, Confidence interval (CI) = 1.61–2.96), pulmonary metastases ($p < 0.001$, CI = 1.49–2.98), pleural invasion ($p = 0.007$, CI = 1.04–1.27), tumor size ($p < 0.001$, CI = 1.01–1.02), and CEA level ($p = 0.002$, CI = 1.00–1.01), although adjuvant chemotherapy has no significant relationship with DFS ($p = 0.60$).

Conclusions:

The finding of MVI in NSCLC is frequent. MVI correlates with tumor stages. The presence of MVI is an independent negative prognostic factor on both DFS and OS. Patients with these predictive factors of recurrence may be good candidates for intensive adjuvant chemotherapy.

Disclosure: No significant relationships.

P-170

MEDIASTINAL NODAL DISSECTION IN THE LEARNING CURVE OF VATS ANATOMIC RESECTIONS: IS IT GOOD ENOUGH?

Luis Hernandez-Arenas¹, R. Bilancia², E. Internullo³

¹*Thoracic Surgery, Nottingham City University Hospital NHS Trust, Nottingham, United Kingdom*

²*Thoracic Surgery, Nottingham University Hospitals, Nottingham, United Kingdom*

³*Digestive Diseases and Thoracics, Nottingham City Hospital, Nottingham, United Kingdom*

Objectives:

To audit a single surgeon experience with regard to the accuracy of nodal dissection in VATS (early learning curve) vs. open (expert level) anatomic resections.

Methods:

Retrospective study based on prospectively collected database. All patients operated by lobectomy or segmentectomy for early stage (I-II), clinical N0 lung malignancy (NSCLC and carcinoid) under a single surgeon from november 2011 to november 2013 were included. Exclusion criteria were: mediastinoscopy before lung resection and conversion VATS-to-open. Patients were divided into VATS and open group. They were analysed with regard to extent of surgery (lobectomy/segmentectomy), Thoracscore, performance status (PS), pulmonary function tests (PFTs), size of T, pathologic diagnosis, cTNM and pTNM, number of sampled/dissected mediastinal nodal stations, change in stage due to upgrade in N status at final pathology.

Results:

Sixty-eight patients were eligible, 30 in the VATS group (14 males, median age 67, range 42-92) and 38 in the open group (23 males, median age 64.5, range 46-83). The 2 groups were homogeneous with regard to extent of resection, Thoracscore, PS, FEV1, T size, cTNM. The number of mediastinal node stations sampled/dissected was found to be significantly lower in the VATS group (mean 2.4, SD0.68) vs open (3.13, SD1.1) (Student's t-test, $p<0.05$). The number of patients who changed their TNM stage as a results of pN status upgrade was 3/30 in VATS (10%) and 5/38 in open (11%), not statistically significant (Fisher's exact test $p=0.99$).

Conclusions:

Mediastinal nodal stations sampled/dissected were significantly less in VATS as compared to open group, even though the upgrade in stage due to change in nodal p-staging was not compromised. In the steep learning curve of VATS anatomic resection, it is common to fall short of recommended standards for nodal dissection. Constant auditing of own performance with regard to nodal dissection is required in order to ensure adequate intraoperative staging.

Disclosure: No significant relationships.



P-171

DOES SOCIOECONOMIC STATUS MATTER WITH PERIOPERATIVE OUTCOMES AFTER ROBOTIC-ASSISTED PULMONARY LOBECTOMY?

Emily Ng¹, K. Rodriguez¹, F.O. Velez-Cubian², M.R. Thau¹, W.W. Zhang², C.C. Moodie³, J. Garrett³, J.P. Fontaine³, L. Robinson³, E. Toloza³

¹College of Medicine, University of South Florida Morsani College of Medicine, Tampa, United States of America

²Department of Surgery, University of South Florida Morsani College of Medicine, Tampa, United States of America

³Thoracic Oncology, Moffitt Cancer Center, Tampa, United States of America

Objectives:

Lower socio-economic status has been correlated with poorer survival rate and surgical outcome in various cancers. This study sought to determine whether socio-economic status affects surgical outcomes following robotic-assisted pulmonary lobectomy.

Methods:

We retrospectively studied 189 consecutive patients who underwent robotic-assisted pulmonary lobectomy by one surgeon for known or suspected lung cancer. We used median income of residential ZIP codes as surrogate of socio-economic status and grouped patients based on whether ZIP-based median income was less than (Group 1) or greater than (Group 2) 300% of the federal poverty line, which is the threshold for various federal benefits. Incidence of postoperative complications, chest tube duration, hospital length of stay (LOS), and in-hospital mortality were compared between the groups. Statistical significance ($p < 0.05$) was determined by Fisher's exact test and Student's t-test.

Results:

Group 1 tended to have a higher postoperative complication rate compared to Group 2 (8 of 20 [60%] vs. 63 of 169 [37%] patients, respectively; $p = 0.057$). Median chest tube durations for Groups 1 and 2 (5 days vs. 4 days, respectively) did not differ significantly ($p = 0.09$). Median hospital LOS for Groups 1 and 2 (5.5 days vs. 5 days, respectively) also did not differ significantly ($p = 0.33$). Lastly, in-hospital mortality for Groups 1 and 2 (1 of 20 [5.0%] vs. 3 of 169 [1.8%] patients, respectively) did not differ significantly ($p = 0.36$).

Conclusions:

Lower socio-economic status may result in higher likelihood of postoperative complications, but did not affect chest tube duration, hospital LOS, or in-hospital mortality after robotic-assisted pulmonary lobectomy.

Disclosure: E. Toloza: Proctor and observation site for Intuitive Surgical Corp., Inc., and da Vinci Robotic Surgical System

P-172

DETERMINATION OF THE ROLE OF BODE INDEX IN THE CHARACTERIZATION OF THE POST-OPERATIVE COMPLICATIONS AMONG THE PATIENTS WHO UNDERWENT LUNG RESECTIONNezih Ozdemir¹, H. Ersoz¹, S. Ozalevli², A. Karakilic¹¹*Thoracic Surgery, Dokuz Eylul University, Izmir, Turkey*²*School of Physical Therapy and Rehabilitation, Dokuz Eylul University, Izmir, Turkey***Objectives:**

It was proven that the majority of patients with lung cancer had accompanying chronic obstructive pulmonary disease. However, before lung resection, the evaluations specific to this condition remain insufficient. Our study was planned based on the assumption that BODE index, which is an accepted prognostic factor in the chronic obstructive pulmonary disease, could predict the parameters related to post-operative complications and the duration of hospital stay among the patients with lung cancer accompanied by chronic obstructive pulmonary disease, for whom lung resection was scheduled.

Methods:

We enrolled 33 patients (30 male and 3 female) who will undergo lung resection. During the pre-operative period, spirometry and stair climbing test were performed and BODE index was calculated. At the end of the stair climbing test, highest oxygen consumption was calculated using the standard formula. The patients were divided into four groups by their BODE index: Group 0 (n=8), Group 1 (n=14), Group 2 (n=7) and Group 3 (n=4).

Results:

There was no significant difference among the groups in terms of demographics and clinical characteristics, exercise capacity and the previous operations ($p>0.05$). BODE index was found to be significantly correlated with all spirometric values of the patients ($r=-0.36/-0.58$), secretion retention, respiratory failure and additional non-pulmonary complications ($r=0.49/0.50$) as well as post-operative extubation, hospitalization in the intensive care unit, duration of hospital stay and the need for additional oxygen supply ($r=0.34/0.40$) ($p<0.05$). Highest oxygen consumption was not correlated with any these parameters ($p>0.05$).

Conclusions:

Consequently, we suggest that among the patients with the indication of lung resection, accompanied by airway obstruction, BODE index is an important parameter that should be routinely used in the daily practice due to its ability to predict the post-operative complications.

Disclosure: No significant relationships.

P-173

RECURRENCE PREDICTORS IN INTENTIONAL LIMITED RESECTION FOR CT1A0M0, GGO-DOMINANT LUNG ADENOCARCINOMAS

Yuki Matsumura¹, J. Yoshida¹, G. Ishii², K. Aokage¹, T. Hishida¹, K. Nagai¹

¹*Division of Thoracic Surgery, National Cancer Center Hospital East, Kashiwa, Japan*

²*Pathology Division, Research Center for Innovative Oncology, National Cancer Center Hospital East, Kashiwa, Japan*

Objectives:

We recently reported that, in our in-house prospective trial of intentional limited resection (ILR) for pulmonary ground glass opacity (GGO)-dominant adenocarcinomas ≤ 2 cm, 4 (15%) of 26 patients developed possible cut-end recurrence more than 5 years after ILR*. This urged us to seek recurrence predictors based on the entire ILR population at our institution.

Methods:

Between 1992 and 2007, there were 68 patients who underwent ILR (7 segmentectomies and 61 wedge resections) for peripheral, GGO-dominant, cT1aN0M0 adenocarcinomas ≤ 2 cm in our hospital. We retrospectively reviewed their clinicopathological characteristics and determined the predictive factors for recurrence, paying special attention to consolidation/tumor (C/T) ratio on thin-section CT, surgical margin, and new IASLC/ATS/ERS classification of adenocarcinoma**.

Results:

The median age was 64 years (range: 30-81), and 25 (37%) were men. Median follow-up period was 95 months (range: 48-156 months), and 6 (9%) patients developed recurrence. All of their tumors had pathologically invasive components (acinar, papillary, micropapillary, and/or solid subtypes), while 13 (21%) of the remaining 62 patients without recurrence did, which was significantly different ($p < 0.01$). All patients with recurrence had tumors of C/T ratio > 0 (mixed GGO), compared to 30 (48%) without recurrence ($p = 0.02$). Even among 35 patients of C/T ratio ≤ 0.25 , 6 (17%) had invasive components. There were no significant differences in surgical margin, preoperative tumor size, or resection extent between the groups.

Conclusions:

Pathologically invasive components and C/T ratio > 0 (mixed GGO) were significant predictors of recurrence after ILR. Such predictors, especially preoperative factors, need to be established to securely indicate ILR for small GGO-dominant adenocarcinomas.

*Nakao M, et al. JTO. 2012; 7: 1563-1566

**Travis WD, et al. JTO. 2011; 6: 244-85

Disclosure: No significant relationships.

P-174

EXAMINATION OF THE RESPIRATORY FUNCTION PRESERVATION EFFECT OF ANATOMICAL SEGMENTECTOMY FOR LUNG CANCERKatsuo Kojima¹, M. Yano¹, K. Okubo²¹*Thoracic Surgery, Musashino Red-Cross Hospital, Tokyo, Japan*²*Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan***Objectives:**

We have performed radical anatomical segmentectomy with lymph node dissection to small-sized lung cancers since 2003 including anatomical segmentectomy with resection of adjacent subsegment (as follows: ‘complicated subsegmentectomy’) which is performed in the case the tumor is near to the intersegmental plane so that it is not enough to keep surgical margin. We are interested whether these methods are superior to segmentectomy with stapler or lobectomy in respiratory function preservation.

Methods:

Our surgical procedure of anatomical segmentectomy and complicated subsegmentectomy is followed: Targeted artery and bronchus are divided and intersegmental plane in pulmonary hilum side is cut along intersegmental vein. Targeted segment and/or subsegment are inflated and the intersegmental plane is cut along the inflation-deflation line with ultrasonic scalpel until the isolation reaches the cutting line of the hilum. We have undergone anatomical segmentectomy (non-complicated subsegmentectomy) 61 cases (=S group, mean number of resected segments=1.45), complicated subsegmentectomy 42 cases (=SS group, 1.46) and segmentectomy with stapler 45 cases (=SWS group, 1.46). We investigated post operative respiratory function and prognosis in these cases and latest 100 Stage IA cases in which lobectomy was performed (=L group, as a control).

Results:

Vital Capacity (=VC) in post operative 6 months decreased in a ratio of 13% in S, 8% in SS, 19% in SWS and 20% in L in comparison with preoperative VC (Each significant difference between SS and S, S and SWS/L ($p<0.05$)), and FEV1.0 11% in S, 6% in SS, 12% in SWS and 16% in L (A significant difference between SS and others ($p<0.05$)). Five years survival was 93% in S, 96% in SS, 84% in SWS and 89% in L (NS).

Conclusions:

Anatomical segmentectomy, particularly ‘Complicated subsegmentectomy’, is an excellent surgical procedure which gives good respiratory function preservation without a survival rate decrease. But segmentectomy with stapler hardly contributes to respiratory function preservation.

Disclosure: No significant relationships.

P-175

THROMBOCYTOSIS INDUCED BY SURGERY IN NSCLC PATIENTS

Vasileios Kouritis¹, I. Bellenis¹, A. Psevdi², C. Zisis¹

¹*Cardiothoracic Surgery, Evangelismos Hospital, Athens, Greece*

²*Anesthesiology, Evangelismos Hospital, Athens, Greece*

Objectives:

Thrombocytosis is considered a poor prognostic factor of survival in non small cell lung cancer (NSCLC) patients. Whether surgery has an effect upon thrombocytosis has not been adequately investigated. Aim of the study is to detect if surgery affects the appearance of thrombocytosis in surgically treated NSCLC patients.

Methods:

The records of 270 patients operated for NSCLC during 2 consecutive years (2009-2010) were retrospectively analyzed. Data reviewed included the demographic data, the stage and type of NSCLC, the type of surgery performed, the invasion of the visceral pleura and the invasion of the bronchial margins. The number of platelets was determined before surgery, the next day, every 2 days postoperatively until the first postoperative month, and during the follow-up period. Thrombocytosis was considered when a value of platelets $\geq 400 \times 10^3/\text{mm}^3$ was measured.

Results:

Two hundred were men. The mean age was 60.8 ± 14.5 years. Preoperative thrombocytosis was observed in 21 patients (7.8%), while postoperative thrombocytosis was found in 119 (44.1%, $p=0.030$). The median time after surgery for thrombocytosis was 0.3 months. Postoperative thrombocytosis was observed more frequently in pneumonectomies (56.4%) and lobectomies (49.3%) when compared to atypical tumor excisions (32.2%, $p=0.012$). No association was found between postoperative thrombocytosis and oncological parameters. Thrombocytosis was higher after surgery ($376,192 \pm 130,877$ vs $245,375 \pm 112,938$, $p=0.0001$) even in preoperative thrombocytosis cases ($635,000 \pm 186,996$ vs $493,187 \pm 113,150$, $p=0.009$). Similar observations were made for benign cases. Multivariate analysis revealed that the type of surgery was independently associated with postoperative thrombocytosis, whereas the stage of the disease is related to the preoperative thrombocytosis.

Conclusions:

Postoperative thrombocytosis is not related to oncological parameters but to the extent of the resection. Surgical stress seems to be the cause of postoperative thrombocytosis. On the contrary, preoperative thrombocytosis is related to the stage of the disease, and clinicians might include it in the study of oncological components.

Disclosure: No significant relationships.

P-176

PROGNOSTIC MODEL FOR NON-SMALL CELL LUNG CANCER PATIENTS LONG-TERMPSTOPERATIVESURVIVALANDHEALTH-RELATEDQUALITY OF LIFE

Ville Rauma¹, I.K. Ilonen¹, H. Sintonen², J.V. Räsänen¹, J.A. Salo¹

¹*Clinic of General Thoracic and Esophageal Surgery, Helsinki University Central Hospital, Heart and Lung Center, Helsinki, Finland*

²*Department of Public Health, Helsinki University, Faculty of Medicine, Helsinki, Finland*

Objectives:

To evaluate patient, disease and treatment features in order to predict long-term survival and long-term health-related quality of life (HRQoL) among above patient groups.

Methods:

586 non-small cell lung cancer (NSCLC) patients were operated January 2000-June 2009. Two validated quality of life questionnaires, the 15D and the EORTC QLQ-C30, were sent to patients alive, June 2011. Patient, disease and treatment features predicting survival and long-term HRQoL were identified using a binary logistic regression model and two different linear regression models, respectively. Features included in the models: gender, age at time of operation, time since operation, smoking status and smoking pack years, comorbidities measured with Charlson comorbidity index, preoperative FEV1 % of predicted value, neoadjuvant therapy, type of operation and extent of resection, pathological stage and histology of tumor, postoperative complications, and adjuvant therapy.

Results:

276 patients were sent questionnaires and 230 (83%) replied. Median follow-up time was 4.85 years. Features predicting lower survival rate: old age at operation time, presence of comorbidity, pathological stage II-IV, post-operative infections, male gender. Features associated with poorer long-term HRQoL measured with the 15D: comorbidity, preoperatively decreased FEV1% of predicted value, postoperative complications use of VATS-technique. When measured with QLQ-C30, decreased preoperative FEV1% and bleeding complications had similar effect on HRQoL, while adjuvant chemotherapy was predicted higher long-term HRQoL. All numerical results with $p < 0.05$ are given in the Table. The score representing HRQoL ranges between 0-1 in 15D and 0-100 in QLQ-C30, a higher score representing a better quality of life.

Conclusions:

With the patient and disease features used in the study, long-term survival can be predicted fairly well while long-term HRQoL stays poorly predictable. Postoperative complications seem to have a long-lasting effect on patients' wellbeing. Better indicators for long-term HRQoL need to be determined in the future, especially such that can be altered already preoperatively.

Disclosure: No significant relationships.



P-177

IS VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) LOBECTOMY ASSOCIATED WITH LOWER 30-DAY MORBIDITY THAN LOBECTOMY BY THORACOTOMY?

Lykke Østergaard Laursen¹, R.H. Petersen², H.J. Hansen², T. Jensen³, J. Ravn², L. Konge¹

¹Centre for Clinical Education, University of Copenhagen and the Capital Region of Denmark, Copenhagen, Denmark

²Department of Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark

³Department of Environmental Medicine, Faculty of Health Sciences, Odense, Denmark

Objectives:

To compare the morbidity and mortality within the first 30 postoperative days for VATS lobectomy and lobectomy by thoracotomy.

Methods:

Data were obtained from prospectively collected national and regional databases including all patients who underwent lobectomy or bi-lobectomy for lung cancer from January 1st 2005 to December 31st 2011. All patients operated before 2009 were restaged according to the latest IASLC lung cancer classification, using the national pathology register. Patient characteristics, co-morbidities, pathology, and operative data were collected prospectively and assessed using Pearson's χ^2 and independent samples t-tests. Morbidity and mortality were assessed using multiple logistic regression, and adjusted for sex, age, stage, FEV1 and modified Charlson co-morbidity index.

Results:

In total, 1390 patients underwent lobectomy, 789 patients via VATS and 601 patients via thoracotomy. The two groups were similar in sex, FEV1 and modified Charlson co-morbidity index. The patients operated by VATS were older ($p<0.001$), had more adenocarcinomas ($p<0.001$), and had a lower cancer stage ($p<0.001$). 492 VATS patients (62.5 %) and 312 thoracotomy patients (51.9 %) avoided minor complications, $p<0.001$. 626 VATS patients (79.7 %) and 389 thoracotomy patients (64.7 %) avoided major complications, $p<0.001$. The 30-day mortality were 8 patients (1.0 %) in the VATS group and 9 patients in the thoracotomy group (1.5 %); $p=0.47$. Multiple logistic regression analysis showed that the incidence of both minor (OR, 1.6; $p<0.001$) and major complications (OR, 2.2; $p<0.001$) were significantly higher for the patients who underwent lobectomy via thoracotomy compared with VATS lobectomy.

Conclusions:

Patients undergoing lobectomy via thoracotomy were 1.6 times more likely to have a minor complication within the first 30 postoperative days and 2.2 times more likely to have a major complication, compared to patients operated by VATS. There was no difference in 30 day mortality.

Disclosure: R.H. Petersen: Speaker by Covidien

H.J. Hansen: Speaker by Covidien

P-178

PROPHYLACTIC LIGATION OF THE THORACIC DUCT DOES NOT ALWAYS PREVENT POSTOPERATIVE CHYLOTHORAX IN PULMONARY RESECTION

S. Uchida, Hiroshi Nakamura, T. Matsunaga, M. Fukui, T. Banno, K. Takamochi, S. Oh, K. Suzuki

Department of General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan

Objectives:

Postoperative chylothorax is a rare but not a negligible complication for thoracic surgeons. An optimal management of chylothorax has not been established. This study focused on the efficacy of intraoperative ligation of the thoracic duct for prevention of chylothorax.

Methods:

This study was conducted on 50 patients (pts) who had postoperative chylothorax which represented 4% of 1235 pts who underwent pulmonary resection between 2008 and 2012. Diagnosis of chylothorax was confirmed with concentration of triglyceride in thoracic drainage > 110 mg/dl or milky fluid. Pneumonectomy was performed in 2, bilobectomy in 1, lobectomy in 44, and 1 segmentectomy. All pts underwent systematic nodal dissection. Prophylactic ligation of the thoracic duct was performed in 21 (42%) pts (Group A), and no ligation in 29 pts (Group B). Postoperative management and clinical course was investigated for evaluating the efficacy of a prophylactic ligation of the duct.

Results:

Low fat diet including 20g of fat was indicated in all chylothorax pts. Following that, when the amount of drainage decreased conservative treatment was indicated (n=41), otherwise surgical intervention was indicated (n=9). Nine reoperated patients underwent direct ligation of the site of chylous leakage in 9, and concomitant ligation of the thoracic duct in 7. There were no significant difference in the thoracic drainage on the first postoperative day, the duration of drain placement and postoperative hospital stay between group A and B. As to reoperation, 2 (9.5%) in group A, and 7 (31%) in group B underwent surgical intervention for controlling chylothorax, and the difference was statistically significant ($p=0.025$ in Fishers's exact test).

Conclusions:

Prophylactic ligation of the thoracic duct did not always prevent postoperative chylothorax. However, that procedure significantly decreased the need for reoperation for chylothorax in this study. Thus prophylactic ligation of the duct is one of the options for pts who underwent systematic lymphadenectomy.

Disclosure: No significant relationships.

P-179

VIDEO ASSISTED THORACOSCOPIC SURGERY FOR PULMONARY ASPERGILLOMA IN CHILDREN WITH CANCER

Nikolaos Anastasiou¹, G. Hardavella¹, A. Katsipoulakis¹, K. Mpaka², E. Kosmidou², N. Panagopoulos¹

¹Thoracic Surgery, Kifisia General Oncology Hospital 'Agioi Anargiroi', Athens, Greece

²Paediatric Oncology, Children's Oncology Hospital 'Elpida', Athens, Greece

Objectives:

Evaluation of patient outcome and clinical effectiveness of video assisted thoracoscopic resection (VATS) of pulmonary aspergilloma in children with cancer.

Methods:

We studied retrospectively all children diagnosed with cancer that underwent a VATS resection of pulmonary aspergilloma. Medical records, imaging and pathology tests were thoroughly reviewed and patients were followed up in the thoracic outpatients clinic.

Results:

During 2009-2011, 6 children (3 males, 3 females) with a solid diagnosis of cancer and a mean age of 11.7 years (range 11-16), underwent VATS resection (wedge resection/segmentectomy) of a pulmonary aspergilloma. Children's history of active cancer was as follows; 1 Hodgkin's disease, 1 Ewing's sarcoma, 2 Acute Lymphoblastic and 2 Acute Myeloblastic Leukemia. Aspergillus species was grown in 5/6 and Fusarium in 1/6. VATS resection was combined with antifungals pre and post operatively. No procedure related complications were recorded. Mean hospital stay was 6.7 days. Sixteen month follow up showed no Aspergillus recurrence. During that time, 1/6 patients were deceased due to his main sinister pathology.

Conclusions:

VATS resection of pulmonary aspergilloma in children is a safe minimal invasive technique that assures clinical results equal to open thoracotomy while minimising patient burden. It could be proposed as the procedure of choice in the immunocompromised paediatric population.

Disclosure: No significant relationships.

P-180

VALUE OF SERUM LACTATE KINETICS AFTER LUNG RESECTION

Sokratis Tsagkaropoulos¹, M. Sileli², F. Ampatzidou², T. Karaikos¹, A. Madesis¹, K. Diplaris¹, N. Mihail¹, G. Drosos¹

¹Cardiothoracic Surgery Department, "G. Papanikolaou" General Hospital, Thessaloniki, Greece

²Cardiac Surgery Intensive Care Unit, "G. Papanikolaou" General Hospital, Thessaloniki, Greece

Objectives:

Serum lactate level is commonly used in critically ill patients as indicator of tissue hypoperfusion and hypoxia to evaluate prognosis. In cardiothoracic procedures, the significance of lactate level is well documented after heart surgery, however little is known on lung resection and lactate's trend. This study aims to investigate the kinetics of lactate level and its ability in predicting adverse events after lung surgery.

Methods:

Between January – December 2013, 149 consecutive lung resections were performed for malignant or benign disease (58.4% vs 41.6%; M/F=121/28; Age=57.1±15.3 years). Patients underwent other thoracic procedures and affected by diabetes mellitus and hepatic or renal disorders were excluded. Arterial blood samples were taken to determine lactate levels at six different time points: preoperatively, immediately postoperatively and 3rd, 6th, 12th and 24th hours after surgery. The values obtained were correlated with type of surgical approach and procedure, pO₂ and pO₂/FiO₂ ratio, postoperative complications (cardiac or respiratory) and 30-days mortality. The predictive value of each measurement for adverse events and their corresponding cut-off value were determined using the ROC curve statistic.

Results:

In 113 patients thoracotomy was performed, while 36 procedures were underwent using videothoracoscopy, for a total of 69 minor and 80 major lung resections. 30-days mortality was 0.7%. Preoperative lactate level was 1.49±0.45 mmol/L with significant reduction at the 12th and 24th hours (1.22±0.68 and 1.07±0.52 mmol/L; p<0.01). There was a correlation between lactate level and developing of respiratory complications at three time points: preoperatively (1.46±0.44 vs 1.72±0.52; p=0.03), 12th hours (1.18±0.61 vs 1.76±1.18; p=0.02) and 24th hours (1.02±0.43 vs 1.54±1.05; p=0.01). Lactate values also showed particular ability to predict postoperative respiratory complications (Table).

Conclusions:

Postoperative serum lactate level seems to be a useful indicator to predict respiratory complications after lung resection. In addition, in our opinion, further research on this field should be made.

Lactate (mmol/L)	Area	Cut-off	Sensitivity (%)	Specificity (%)	95% confidence interval	<i>p</i> value (area=0.5)
Preop	0.65	>1.4	66.7	55.5	0.56-0.73	0.05
Postop	0.63	>1.6	62.5	66.2	0.52-0.73	0.177
3 rd	0.72	>2	62.5	78.75	0.61-0.81	0.01
6 th	0.72	>1.7	75	73.75	0.61-0.81	0.006
12 th	0.69	>0.9	100	43.05	0.58-0.79	0.04
24 th	0.7	>0.9	85.71	53.85	0.59-0.79	0.05

Disclosure: No significant relationships.

P-181

POSTOPERATIVE PULMONARY MORBIDITY IS NOT INFLUENCED BY THE SIZE OF THE THORACOTOMY IN PATIENTS WITH LOW PULMONARY VOLUMES

María Rodríguez, M.T. Gómez-Hernández, N. Novoa, J.L. Aranda, M.F. Jiménez, G. Varela
Thoracic Surgery, Salamanca University Hospital, Salamanca, Spain

Objectives:

This investigation is aimed to test the hypothesis that in patients with low predicted postoperative FEV1 (ppoFEV1) a small thoracotomy incision represents a lower risk of postoperative pulmonary complications (PPC).

Methods:

Retrospective study of matched pairs of cases and controls on a population of 1491 NSCLC cases who underwent anatomical complete resection. In this study only 70 patients in the 10% percentile of ppoFEV1 (43.8%) were included. Cases were operated through a 5-8 cm axillary thoracotomy assisted by video using rib spreader, and controls through standard muscle-sparing thoracotomy. Cases and controls were matched by propensity scoring including the following variables in the calculation: age, type of lung resection (anatomical segmentectomy, lobectomy, bilobectomy or pneumonectomy), pathological stage and type of postoperative care received (if the patient was included or not in a fast-tracking program including early ambulation and intensive physiotherapy). The studied outcome was the postoperative occurrence of any pulmonary complication (PPC) prospectively defined and recorded. Odds ratio and its 95%CI was calculated using Stata 12.1.

Results:

The population includes 70 patients, 40 cases and 30 controls. The prevalence of PPCs in the case series was 20% (8/40) and 13.3% (4/30) in the control group. The odds ratio is 1.62 (95%CI: 0.38-8.17; p=0.463).

Conclusions:

The size of the thoracotomy is not related to the risk of developing PPCs after lung resection in patients with low ppoFEV1.

Disclosure: No significant relationships.

P-182

TEMPORAL TRENDS OF SURGICAL SITE INFECTIONS AFTER VATS: PROSPECTIVE STUDY IN 1,362 CONSECUTIVE PATIENTS

Andrea Imperatori, N. Rotolo, S. Spampatti, V. Quintodei, M. Castiglioni, E. Nardecchia, L. Dominioni

Center for Thoracic Surgery, University of Insubria, Varese, Italy

Objectives:

The occurrence of surgical site infections (SSI) after VATS has been scarcely investigated. We examined the temporal trends of SSI (wound infection, pneumonia, empyema) over 15 years in a monocentric series of patients undergoing VATS.

Methods:

The 1,362 consecutive patients who underwent VATS clean procedures [wedge resection (n=543), bullectomy/pleurectomy (n=160), pleural/mediastinal biopsy (n=564), treatment of pleural effusion/haemothorax (n=95)] in 1999-2013 at our institution were prospectively evaluated. Procedures performed in three consecutive 5-year periods were considered: group 1 (n=406; 1999-2003); group 2 (n=457; 2004-2008); group 3 (n=499; 2009-2013). Preoperatively we recorded the following risk-factors for infection: age, lymphocyte count, serum albumin, FEV1% of predicted, VATS duration. Talc pleurodesis (if any) was recorded. Short-term antibiotic prophylaxis was administered to 93%, 96% and 99% of patients respectively in group 1, 2 and 3. We prospectively recorded the occurrence of 30-day postoperative SSI and analyzed the correlation between risk factors and SSIs.

Results:

Overall, 74 of 1,362 patients (5.4%) developed one or more SSIs. Wound infection, pneumonia and empyema rates were 1.5%, 4.0%, 0.7% respectively. The 30-day postoperative mortality rate was 0.5% (7 patients, none died from SSI). Through the 15-year observation period, SSI rates remained substantially stable (Table). Univariate analysis showed significantly higher wound infection rate among the 229 patients who underwent talc pleurodesis than in the 1,133 who did not (3.5% vs. 1.1%; $p=0.0196$). At multivariate analysis, low serum albumin (<3.5 g/dL) correlated with the occurrence of SSI ($p=0.0165$); talc pleurodesis correlated with wound infection ($p=0.0172$) and with empyema ($p=0.0356$).

	Group 1 (1999-2003)	Group 2 (2004-2008)	Group 3 (2009-2013)	p value
Patients undergoing VATS (n)	406	457	499	
Age (years, mean±SD)	57±16	54±20	58±19	NS (0.2627)
Serum albumin (g/dL, mean±SD)	3.8±0.6	4.0±0.6	3.8±0.6	NS (0.8606)
Lymphocyte count (cells/μL, mean±SD)	1831±685	1884±828	1836±843	NS (0.9767)
FEV 1 (% of predicted, mean±SD)	83±22	86±24	88±24	NS (0.0541)
VATS duration (min, mean±SD)	59±32	62±28	58±28	NS (0.8117)
Patients with 1 or more SSIs (%)	25 (6.2%)	22 (4.8%)	27 (5.4%)	NS (0.8517)
Wound infection (n, %)	7 (1.7%)	4 (0.9%)	10 (2.0%)	NS (0.5028)
Pneumonia (n, %)	18 (4.4%)	19 (4.2%)	18 (3.6%)	NS (0.8962)
Empyema (n, %)	6 (1.5%)	1 (0.2%)	2 (0.4%)	NS (0.1393)
Overall Mortality (n, %)	4 (0.98%)	2 (0.44%)	1 (0.20%)	NS (0.4926)

Conclusions:

After VATS procedures the overall SSI rate was stable at about 5% through 15 years and mortality remained <1%. Wound infection rate, a gold-standard of clean surgery performance, remained <2%. Moreover, our findings confirm that also in VATS procedures low albumin level is an important prognostic indicator of SSI. The correlation between talc pleurodesis and increased wound infection rate remains to be investigated.

Disclosure: No significant relationships.

P-183

EARLY TERM RESULTS OF A COMPARISON BETWEEN GENERAL ANESTHESIA AND SEDOANALGESIA IN INTERSTITIAL LUNG DISEASE: A RANDOMISED PROSPECTIVE STUDY

C. Atinkaya Ozturk¹, S. Evman¹, S. Metin¹, N. Coskun², M. Kavas³, Talha Dogruyol¹, A. Misirlioglu¹, V. Baysungur¹

¹*Thoracic Surgery, Sureyyapasa Chest Disease Research and Training Hospital, Istanbul, Turkey*

²*Anesthesia, Sureyyapasa Chest Disease Research and Training Hospital, Istanbul, Turkey*

³*Chest Disease, Sureyyapasa Chest Disease Research and Training Hospital, Istanbul, Turkey*

Objectives:

Tissue biopsy in diagnosis of interstitial lung disease (ILD) is generally carried out with general anesthesia. In the study, we performed wedge biopsy under sedoanalgesia without the need for intubation or muscle relaxant agents via single port. The aim of this report is to compare impact on morbidity of wedge biopsy 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=5) were named Group 1, while sedoanalgesia patients (n=5) 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, postoperative pain.

Results:

Mean age was 44.1. In Group 1 average operation time was 50 minutes, while it was 38 minutes in Group 2. One patient had hiccups in Group 2 during operation. Average duration of the chest tube was 18.4 hours in Group 1, whereas it was 16.0 hours in Group 2. There were no complication in two groups and no mortality was observed. All patients were operated uniportally in group 2. Patients were discharged in an average of 3.4 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 7.2, 6.0 in the sixth hour, 5.4 in 12. hour, 3.8 in 24. hour, 2.8 in the first week. In group 2 it was 7.6, 6.8, 5.0, 3.8, 1.6 respectively.

Conclusions:

Our early 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.

P-184

THE IMPACT OF CENTRALIZATION ON PNEUMONECTOMY RATE AND MORTALITYLars Ladegaard, E. Jakobsen, P.B. Licht*Cardiothoracic Surgery, Odense University Hospital, Odense, Denmark***Objectives:**

The Danish Lung Cancer Register (DLCR) has since its foundation in 2000, documented a significant rise in quality of lung cancer treatment. The Objective of this study was to describe the impact of surgical centralization with focus on pneumonectomy-rate and mortality.

Methods:

In 1989 The Danish Thoracical Society facilitated a national wide survey with focus on surgical procedures and mortality(1). In the period 1982-1986 the procedures was performed in 11 surgical departments, (5 nonspecialized and 6 specialized) . DLCR Annual Rapports from 2001 to present has been published. The two historical datasources is compared.

Results:

In the years 1982-1986 38,3% of all operations for lung cancer were pneumonectomies. The in-hospital mortality rate was on an average 11,2%. 21,4% on non-specialized and 9,0% on specialized departments. The non-specialized departments performed 18 procedures yearly, ranging from 5 to 30. The Thoracic Surgical departments had a mean aktivty of 82 operations (range 55-103). The gender distribusion was 74/26 male /female. The authors concluded that centralization was needed. In the following years the Danish Lung Cancer Group was established by large achievement from the different medical specialities handling lung cancer investigation and treatment. This initiativ lead to a still ongoing rise in quality by reference programs, audits, datacollection. ond centralization. The first annual rapport from DLCR revealed data from 2001. 2 non-specialized and 5 specialized surgical departments. The pneumonectomy rate was now declined to 21%, and further the pneumonectomy rate declined to 5% in the years 2010-2012 were only 4 specialized thoracic surgical departments resected lungcancer. In this period the 30-days mortality after pneumonectomy was 5,4% and the gender ratio 50/50

Conclusions:

Encouraged by national guidance, audits and especially centralization in lungcancer treatment the pneumonectomyrate and mortality after pneumonectomy has decreased in the last 30 years.

Disclosure: No significant relationships.

P-185

HOW MUCH THORACIC SURGERY IS NEEDED IN THE TREATMENT OF TRAUMA PATIENTS? RESULTS FROM A NATIONAL TRAUMA REGISTER

Sebastian Angenendt¹, F. Al-Shahrabani¹, D. Vallboehmer¹, I. Witte², S. Flohe², R. Lefering³, W. Knoefel¹

¹Department of Surgery and General Thoracic Surgery, Heinrich-Heine-University and University Hospital Dusseldorf, Dusseldorf, Germany

²Department Traumatology and Hand Surgery, Heinrich-Heine-University and University Hospital Dusseldorf, Dusseldorf, Germany

³Ifom, Institute for Research in Operative Medicine, University of Witten/Herdecke, Cologne Merheim Medical Center, Cologne, Germany

Objectives:

Trauma Patients often have serve injuries of the thorax. However, in most hospitals general thoracic surgeons do not participate in the treatment of trauma patients. This study aimed to reveal the need of general thoracic care in trauma patients by data analysis of a national trauma register.

Methods:

The national trauma register was analysed for the time period between 2002 and 2012 regarding the need of general thoracic care in trauma patients. The standard data collection was used to identify all patients with an injury severity score (SS) of 16 and above with a serve thoracic trauma. Using these searching criteria a total of 24.009 patients were recognized and included in this retrospective study. For all study patients the following clinicopathologic factors were assessed: age, gender, type of trauma (penetrating vs. blunt), severity of the thoracic trauma, rate of chest tubes, rate of thoracotomy/video assisted thoracoscopic surgery (VATS), the level of trauma centre, ISS and the length of ICU/hospital stay were analysed.

Results:

A chest tube was inserted in 31% of the study patients while a thoracotomy / VATS was performed in 4.2% of the patients. Thoracic operations were rarely done in children (1.9%) whereas the frequency in the groups of 18-54, 55-74 and above 75years war nearly similar (3.3%-4.3%). The in-hospital mortality was more than twice as high, when a thoracic operation was performed (7.3% vs. 3.3%) while the cause of trauma itself had a low influence in the rate of operations. But even the injury score was higher in patients undergoing a thoracic operation (ISS>25 vs. <25 leads to 2,6% vs. 4,9%).

Conclusions:

Knowledge of thoracic surgery is mandatory in management trauma patients. The prognosis is worse, if a thoracic operation is necessary. Especially these trauma patients deserve the best treatment, i.e. a thoracic operation by a specialised team.

Disclosure: No significant relationships.

P-186

PULMICC INTERNATIONAL: A RANDOMISED CONTROLLED TRIAL OF PULMONARY METASTASECTOMY IN COLORECTAL CANCER - WORK IN PROGRESSM. Milosevic¹, M. Migliore², B. Lees³, Tom Treasure⁴¹*Institute for Pulmonary Diseases of Vojvodina, University of Novi Sad, Novi Sad, Serbia*²*Thoracic Surgery, University of Catania, Catania, Italy*³*Cteu, Royal Brompton Hospital, London, United Kingdom*⁴*Clinical Operational Research Unit, University College London, London, United Kingdom***Objectives:**

To adequately inform patients with lung metastases of the effect of metastasectomy we need evidence based estimates of the survival after metastasectomy compared with the course of the disease without surgery. There have been no control data in over 100 studies since the 1960s but increasingly sophisticated means of analysis have shown recurrence free survival is probably largely confined to people with a solitary metastasis and an interval since primary resection counted in years. Therefore we cannot know from observational data whether survival is a result of surgery or is due to systematic selection of those with the best natural prognosis. Advanced colorectal cancer predominately affects the liver, abdomen and pelvis; it is rare for pulmonary disease to contribute to the clinical picture. There is no palliative role for lung metastasectomy in asymptomatic patients. The patient's only gain is hope of cure. If that is not attained by pulmonary metastasectomy, patients should be informed and spared unavailing surgery.

Methods:

We are recruiting to a randomised trial in which patients are evaluated according to protocol in Stage 1 and fully informed individualised decisions can be made for or against metastasectomy. If benefit is uncertain, random allocation to active monitoring only, or active monitoring plus metastasectomy, is offered in Stage 2 of the study. Survival, lung function, and quality of life are measured for up to 5 years from randomisation.

Results:

Over 240 patients have been enrolled into Stage 1 and more than 60 have been randomised into Stage 2 from centres in the UK, Serbia and Italy.

Conclusions:

Amongst patients made aware of the uncertain benefit of surgery, randomisation as a means of treatment allocation has been found to be acceptable. The Data Monitoring Committee, at the time of submission, recommends that the study continues as planned.

Disclosure: No significant relationships.

P-187

NON-INTUBATED SINGLE-PORT THORACOSCOPIC SURGERY FOR PRIMARY SPONTANEOUS PNEUMOTHORAX

Yin Chun Chang, W.C. Lin

Division of Thoracic Surgery, Department of Surgery, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Objectives:

Single port thoracoscopic surgery is an new minimally invasive approach for various lung disease, It's more cosmetic and less post operative pain compare to conventional three port thoracoscopic surgery. Nonintubated thoracoscopic surgery also an innovative technique for minimize risk of general anesthesia with double lumen endotracheal tube intubation. However, non-intubated single port thoracoscopic surgery for primary spontaneous pneumothorax has not been reported.

Methods:

We enrolled 20 primary spontaneous pneumothorax patients(mean age 20.9 ± 4.2) who treated with nonintubated single port thoracoscopic surgery. 11 patients received epidural anesthesia and 9 patients received intercostal nerve blockade anesthesia. All patients under Intravenous sedation (propofol) with target-controlled infusion and vagus nerve blockade under direct thoracoscopic vision. A 20mm long incision was made at the fifth intercostal space in the median axillary line, 5mm 30° thoracoscope, a grasper, and an endoGIA stapler were introduced through single port for bullectomy and pleurodesis.(Fig1) The operative time, post operative chest tube drainage, post operative stay and visual analog scale (VAS) pain score were analyzed.



Results:

There was no convert to general anesthesia with endotracheal tube intubation and three port thoroscopic surgery. The mean operative time was 48.3 ± 10 minutes, post operative chest tube drainage was 1.4 ± 1.1 days (range 1 to 6), post operative stay was 2.4 ± 1.2 days (range 2 to 7) and VAS was 1.8 ± 1.1 (range 0.3 to 4.6) in first 24hr after operation. Operative complications developed in 1 patient who had air leaks for more than 3 days postoperatively and 1 (5%) patient had recurrence.

Conclusions:

nonintubated single port thoroscopic surgery for primary spontaneous pneumothorax are technically feasible and safe and more less invasive than conventional three port thoroscopic surgery under general anesthesia with double lumen endotracheal tube intubation.

Disclosure: No significant relationships.

P-188

**BILATERAL LUNG VENTILATION DURING LOBECTOMY:
A LESS INVASIVE METHOD FOR PATIENTS WITH INTERSTITIAL PNEUMONIA**

H. Ishibashi, Ryo Wakejima, A. Asakawa, K. Seto, A. Ui, M. Kobayashi, K. Okubo
Thoracic Surgery, Tokyo Medical and Dental University, Tokyo, Japan

Objectives:

Postoperative acute exacerbation (AE) of interstitial pneumonia (IP) is a serious complication during the surgical treatment of patients with lung cancer and IP. Intraoperative inhalation of high oxygen concentration is considered a risk factor for IP exacerbation, and we intraoperatively used FiO_2 at a low oxygen concentration (<0.50) throughout the induction of anaesthesia. If one lung ventilation was not possible, we operated under bilateral ventilation to maintain a low oxygen concentration. The purpose of this study was to compare perioperative complications and AE of IP after lobectomy under one lung or bilateral lung ventilation.

Methods:

We performed a retrospective study among 380 patients who had undergone lobectomy for primary lung cancer at our institute between April 2010 and December 2013. We retrospectively collected data for 70 patients (18.4%) who had undergone an operation for lung cancer and were diagnosed with IP based on postoperative histopathologic diagnosis. Of the 70 patients, 15 had undergone the operation under bilateral ventilation (group A) and the other 55 patients had undergone the operation under one lung ventilation (group B). The following clinical factors were also investigated: age, sex, smoking index, blood examination results (preoperative C-reactive protein level, white blood cell count, lymphocyte percentage, lactate dehydrogenase level, KL-6 level, and surfactant protein level), arterial blood gas, respiratory function, operative time, blood loss, and postoperative complications.

Results:

The incidence of postoperative AE of IP was 4.3% (3 patients, 2 in group A and 1 in group B). No correlation was observed between groups A and B in terms of frequency of complications or duration of hospitalisation. DL_{CO} , $\%\text{DL}_{\text{CO}}$, PaO_2 , operative time, and blood loss were significantly lower, and preoperative serum KL-6 and LDH levels were significantly higher in group A.

Conclusions:

Bilateral ventilation to maintain a low oxygen concentration is effective and safe for lobectomy in patients with IP.

Disclosure: No significant relationships.

P-189

THE MODERATE LOW INTRAOPERATIVE SUPPLEMENTAL OXYGEN CONCENTRATION FOR TWO-LUNG VENTILATION DURING MINIMALLY INVASIVE ESOPHAGECTOMY MIGHT RESULT IN BETTER POSTOPERATIVE PULMONARY FUNCTIONHao Wang¹, F. Fang², Y. Shen³, M. Feng⁴, J. Cang², L. Tan⁴, Q. Wang¹¹*Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China*²*Department of Anesthesia, Zhongshan Hospital, Fudan University, Shanghai, China*³*Thoracic Department, Zhongshan Hospital of Fudan University, Shanghai, China***Objectives:**

The optimal intraoperative supplemental oxygen concentration during minimally invasive esophagectomy (MIE) remains unknown. It is hypothesized that the moderate low oxygen concentration (about 40%) would be better to protect the pulmonary function for patients, compared with conventional high oxygen concentration (about 80%). The aim of this study was to compare the impact of low and high supplemental oxygen concentration for two-lung ventilation during MIE on the postoperative pulmonary function.

Methods:

From July to December 2013, a total of 80 consecutive esophageal cancer patients with normal pulmonary function were included. All patients underwent thoracoscopic three-stage MIE. Combination of epidural and general anesthesia was performed with two-lung ventilation (intubation with a single-lumen endotracheal tube) and 8ml/kg tidal volume. Of them, the prior 40 patients were given 80% oxygen concentration (Group High), and the later 40 patients were given 40% oxygen concentration (Group Low). Patient demographics and clinical outcomes were recorded and statistically compared.

Results:

In this cohort, the two groups were comparable in demographics as well as pre-operative baseline oxygenation index. No significant difference was found in surgical features, including operative time, blood loss, lymph nodes harvested, total complications or perioperative mortality. Oxygen saturation (as determined by pulse oximetry) could always be maintained $\geq 95\%$ during surgery in all patients. Postoperatively, the oxygenation index was significantly higher in Group Low than in Group High on 6h after operation (342.1 ± 23.9 vs. 324.8 ± 19.9 , $p=0.001$), POD1 (344.9 ± 21.6 vs. 330.9 ± 29.3 , $p=0.017$) and POD2 (363.6 ± 25.1 vs. 350.5 ± 33.0 , $p=0.050$).

Conclusions:

The outcomes of this study suggest that the moderate low intraoperative supplemental oxygen concentration could result in better postoperative pulmonary function with comparison of high oxygen concentration, which might be proper for two-lung ventilation during MIE. However, further randomized controlled trials are required to confirm these findings.

Disclosure: No significant relationships.



P-190

INCIDENCE AND MANAGEMENT OF CHYLOTHORAX AFTER ESOPHAGECTOMY

L. Miao, H. Chen, J. Xiang, Yawei Zhang, B. Li

Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China

Objectives:

Chylothorax is a rare but serious postoperative complication in esophageal cancer patients. The aim of this study was to evaluate its incidence, identify potentially confounding factors and to assess the management.

Methods:

In total, 1342 consecutive esophageal cancer patients who underwent esophagectomy between 2006 and 2012 were reviewed. Perioperative data, including postoperative morbidity and mortality, were analyzed.

Results:

There were 34 patients (2.5%) with chylothorax. Chylothorax was significantly associated with complications (55.9% vs. 26.8%, $p < 0.001$) rather than mortality (2.9% vs. 1.0%, $p = 0.303$). Patients with chylothorax had significantly more pneumonia ($p = 0.011$), more arrhythmia ($p = 0.001$), and longer hospital stay (22 vs. 18 days; $p < 0.001$). Thoracic duct ligation was performed in 29.4% ($n = 10$, median 6 days after esophagectomy). No patient required repeat duct ligation. Conservative therapy was 66 times more likely to fail in patients who had $> 14.8 \text{ ml/kg}$ of chylous output drainage/day after the initiation of conservative therapy ($\text{OR} = 66.67$, $p = 0.001$). Logistic regression analysis showed that $\text{BMI} \geq 25$ was a significant protective factor for chylothorax ($\text{OR} = 0.115$, $p = 0.034$).

Conclusions:

Postoperative chylothorax is associated with significant postoperative morbidity. The chylous output after the initiation of conservative therapy seems to reliably predict the requirement of thoracic duct ligation. High BMI is associated with decreased incidence of chylothorax.

Disclosure: No significant relationships.

P-191

COMBINED THORACOSCOPIC-LAPAROSCOPIC ESOPHAGECTOMY VERSUS OPEN ESOPHAGECTOMY: A META-ANALYSIS OF OUTCOMESW. Guo, Xiao Ma, S. Yang, J. Xiang, H. Chen, H. Li*Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China***Objectives:**

To evaluate the outcomes of combined thoracoscopic-laparoscopic esophagectomy and open esophagectomy.

Methods:

Design: We searched PubMed and Web of Science. Studies comparing combined thoracoscopic-laparoscopic esophagectomy with open esophagectomy were included in the meta-analysis. Pooling was conducted using a random-effects model if $P < 0.10$ or $I^2 > 50\%$ for heterogeneity. Patients: Eleven studies involving 1266 patients were included. Intervention: Combined thoracoscopic-laparoscopic esophagectomy and open esophagectomy. Main Outcome Measurements: Total complication rate, 30-day mortality rate, anastomotic leakage, anastomotic stricture, pulmonary infection, arrhythmia, recurrent laryngeal nerve injury, pulmonary embolism, and blood loss.

Results:

Meta-analysis showed that there were no significance differences between the two groups in total complication rate, 30-day mortality rate, anastomotic leakage, anastomotic stricture, pulmonary infection, arrhythmia, recurrent laryngeal nerve injury, pulmonary embolism, or blood loss ($P > 0.05$). However, the combined thoracoscopic-laparoscopic esophagectomy group had lower pulmonary embolism rates and less blood loss. Limitations: The range of complications do not completely coincide in different reports.

Conclusions:

Combined thoracoscopic-laparoscopic esophagectomy shows similar efficacy for esophageal neoplasms compared to open esophagectomy, and combined thoracoscopic-laparoscopic esophagectomy has lower pulmonary embolism rates and less blood loss during surgery.

Disclosure: No significant relationships.

P-192

THORACIC RECURRENT LARYNGEAL LYMPH NODE METASTASES IN MIDDLE AND LOWER THORACIC ESOPHAGEAL SQUAMOUS CELL CARCINOMAL. Miao, H. Chen, J. Xiang, Yawei Zhang, B. Li*Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China***Objectives:**

To investigate the frequency, and risk factors of thoracic recurrent laryngeal lymph node (RLN LN) metastasis in patients with middle and lower esophageal cancer, and evaluate the prognosis of patients with RLN LN metastasis.

Methods:

We retrospectively analyzed the clinical data of 1223 consecutive patients with esophageal cancer who underwent Ivor-Lewis esophagectomy between 2006 and 2012. Logistic regression analysis was used to identify the factors associated with RLN LN metastasis. The influence of RLN LN metastasis on the overall survival (OS) was assessed by log-rank tests and Cox regression analysis.

Results:

Of the 1223 patients, 565(46.2%) had lymph node metastases. Thoracic recurrent laryngeal nerve lymph node (RLN LN) metastases occurred in 12.4% of the series. For stage T1b tumors, RLN LNs were the most frequent metastasis nodes (10.2%) in mediastinum, followed by paraesophageal nodes (4.8%). Logistic regression analysis showed that longer tumor length ($p=0.019$), and lymphovascular invasion ($P<0.001$) were risk factors for RLN LN metastasis. In patients with lymph node metastases, no significant difference in OS was observed between RLN LN+(for metastasis) and RLN LN-groups. However, in a subgroup of patients with lower thoracic esophageal cancer, RLN LN metastases group had worse OS (median OS 19.4 months vs 37.2 months, $p<0.001$). Cox multivariate analysis showed that N status ($p<0.001$), RLN LN metastasis ($p=0.001$), T status ($p=0.026$), and histologic grade ($p=0.005$) were the independent prognostic factors in patients with lower thoracic esophageal cancer.

Conclusions:

Thoracic recurrent laryngeal lymph node dissection should be carefully conducted in middle and lower esophageal cancer, even if in patients with submucosal cancers. Longer tumor length and lymphovascular invasion are associated with a higher frequency of RLN LN metastasis. RLN LN metastasis is a poor prognostic factor in patients with lower thoracic esophageal cancer.

Disclosure: No significant relationships.

P-193

THE IMPACT OF BODY MASS INDEX ON OUTCOMES AFTER ESOPHAGECTOMY FOR CANCERL. Miao, H. Chen, J. Xiang, Yawei Zhang, B. Li*Thoracic Surgery, Fudan University Shanghai Cancer Center, Shanghai, China***Objectives:**

There is no consensus about the impact of BMI on postoperative complications and survival after esophagectomy. The aims of this study were to analyze the impact of BMI on postoperative complication and prognosis among a large cohort of esophageal cancer patients.

Methods:

In total, 1342 consecutive esophageal cancer patients who underwent esophagectomy between 2006 and 2012 were enrolled in this study. Patients were divided into three groups according to their BMI: normal BMI (18.5-24.9 kg/m²), high BMI (≥ 25 kg/m²) or low BMI (< 18.5 kg/m²). Multivariate logistic regression models were used to identify confounding factors associated with postoperative complications. The impact of BMI on overall survival (OS) was estimated using the Kaplan–Meier method and Cox proportional hazard models.

Results:

Patients were divided into three groups: normal BMI (n=950), high BMI (n=279), and low BMI (n=113). The incidence of anastomotic leakage was higher in the low BMI group (p=0.011). Chylothorax was less frequently present in high BMI group (p = 0.007). Logistic regression analysis showed that BMI was a confounding factor associated with anastomotic leakage (p=0.019) and chylothorax (p=0.034). High BMI group had significantly better OS than low BMI group (p=0.018), while the pathological stage was significantly lower in the high BMI group (p=0.002). T status (p=0.001), N status (p=0.001), and differentiation grade (p=0.006) were identified as independent prognostic factors for OS by Cox multivariate analysis.

Conclusions:

Low BMI is associated with increased anastomotic leak rates, whereas high BMI is associated with decreased incidence of chylothorax. BMI is not an independent prognostic factor for OS. Better overall survival in patients with high BMI might be due to a low pathological stage.

Disclosure: No significant relationships.



P-194

THE EFFECTS OF BILE ACIDS ON COX2 EXPRESSION IN RAT MODEL OF DUODENOESESOPHAGEAL ANASTOMOSISHashimoto Naoki*Surgery, Kinki University, Osakasayama, Japan***Objectives:**

(Aim) It is known that reflux of duodenal contents (bile acids) can induce mucosal injury, stimulate cell proliferation, and promote tumorigenesis. Cyclooxygenase (COX2), an inducible form of COX, has been implicated in both inflammation and carcinogenesis. We examined the expression of COX2 and Prostaglandin E2 (PGE2) in rat esophageal lesions induced by duodenal contents reflux.

Methods:

(Methods) Thirty 8-week male wistar rats were exposed to duodenal content esophageal reflux. All animals underwent an esophagoduodenal anastomosis (EDA) with total gastrectomy in order to produce chronic esophagitis. In ten rats the sham (Control). They were sacrificed at 40th week. Their esophagi were examined for HE, COX2, PGE2, PCNA and total bile acids in the esophageal lumen was measured.

Results:

(Results) After 40 weeks of reflux, columnar dysplasia, squamous cell carcinoma and adenocarcinoma were found. SCC developed in places distant from the anastomosis compared to ADC. This means that histological features may depend on the volume of reflux contents; small amounts of reflux causes SCC and a large volume of reflux causes ADC. Total bile acid in the esophageal lumen was significantly increased in the EDA group compared with the sham operated rats. PCNA LI and esophageal tissue PGE2 were higher in dysplastic and cancer tissue than that of control. Overexpression of COX2 was shown in dysplastic and cancer tissue.

Conclusions:

(Conclusion) In this study, we demonstrate that bile reflux of duodenal contents induce COX2 and increase prostaglandin synthesis in dysplastic and cancer tissue. This result suggests a possible mechanism by which bile acids could promote esophageal cancer.

Disclosure: No significant relationships.

P-195

PREVENTION OF EARLY GASTRIC EMPTYING AND LATE DUODENO-GASTRO-ESOPHAGEAL REFLUX AFTER ESOPHAGOGASTROSTOMY: IS THERE ONE SOLUTION?

Oleksandr Vynnychenko, I. Vynnychenko

Thoracic, Sumy Regional Oncology Center Sumy State University, Sumy, Ukraine

Objectives:

OBJECTIVE: Controversy exists about the need for pyloric drainage following esophageal replacement with gastric tube after esophagectomy for carcinoma of the esophagus and cardia. Although drainage procedure prevents early postoperative delayed gastric emptying and reduces the incidence of aspiration pneumonia, it promotes duodenal bile reflux and makes gastro-esophageal reflux more severe, predisposes to dumping at late postoperative period. The objective of this study was to evaluate the effect of «finger pyloric rupture» as procedure preventing both groups of sufferings.

Methods:

METHODS: 108 patients underwent esophagectomy with gastric conduit replacement. The intrathoracic stomach emptying (1 group - 22 pt without drainage, 2 group - 33 pt with pyloromyotomy after Ramsdtedt and 3 group – 53 pt with «finger pyloric rupture») was investigated by fluoroscopic film examination and esophageal reflux by continuing pH-monitoring.

Results:

RESULTS: results were obtained within 1 postoperative month and 3 months after esophagectomy (Table 1):

	No drainage group (22 pts)	Pyloromyo- tomy Group (33 pts)	«finger pyloric rupture» group (53 pts)			
	1 m	3 m	1 m	3 m	1 m	3 m
no delay	3 (14%)	7(32%)	7 (21%)	9 (27%)	12 (22%)	17 (32%)
slight or mild delay	7 (32%)	8 (36%)	15 (42%)	18 (54%)	23 (43%)	26 (49%)
moderate or severe delay	12 (54%)	7 (32%)	11(37%)	6 (18%)	18 (35%)	10 (19%)
morbidty	12 (54%)		16 (48%)		25 (47%)	
pneumonia/aspiration	5 (23%)		3 (9%)		5 (9%)	
mortality	2 (9%)		1 (3%)		2 (4%)	
anastomotik leak	2 (9%)		1 (3%)		1 (2%)	
reflux	6 (27%)	4 (18%)	10 (30%)	12 (36%)	13 (25%)	10 (19%)
dumping		2 (9%)		12 (36%)		5 (9%)

Conclusions:

CONCLUSIONS: both pyloric drainage groups are superior to no drainage group of patients who underwent esophagogastrostomy in the terms of gastric conduit emptying, especially at early period. «Finger pyloric rupture» group shows conversion from bidirectional nonvalved conduit to unidirectional sphincter during 3 postoperative months which leads to the same level of severity of duodeno-gastro-esophageal reflux and dumping syndrome.

Disclosure: No significant relationships.

P-196

RABEPRAZOLE PROTECTS REFLUX ESOPHAGITIS AFTER TOTAL GASTRECTOMY IN RAT MODELHashimoto Naoki*Surgery, Kinki University, Osakasayama, Japan***Objectives:**

Reflux of duodenal content into the esophagus has a role in the pathogenesis of esophageal inflammatory lesions. As little is known about effective therapy, we studied the effect of proton pump inhibitor(PPI) therapy on esophageal bile reflux in esophagitis after total gastrectomy .The purpose of this study is to clarify the effect of PPI(Rabeparazole) on reflux esophagitis.

Methods:

Sixteen 8-week old male Wistar rats were underwent total gastrectomy and esophagoduodenostomy to induce esophageal reflux of biliary and pancreatic juice. In 5 rats the sham operation (Sham). One week following surgery, they were treated with saline (Control) (n=8) PPI(Rabeprazole)(n=8)(30mg/kg/day)ip for 2 weeks. 3 weeks after operation, all rats were killed and the esophagus was evaluated histologically. Esophageal injury was evaluated by macroscopic ,microscopic findings and expression of COX2 and PGE2. Esophageal washing was aspirated for the evaluation of bile acid activity.

Results:

At 3 weeks after surgery, duodenal reflux induced esophageal erosions and ulcer formation as well as marked thickening of esophageal wall. Histological study showed an increase of thickness of the esophageal mucosa, hyperplasia of epidermis and basal cells, ulcer formation. The macroscopic ulcer score and microscopic ulcer length were significantly reduced by treatment with Rabeprazole. The enhanced expression of COX2 and PGE2 in the control group was also markedly inhibited in the Rabeprazole treated group. The bile acid activity in the esophageal lumen was significantly increased in the control group, and this increase was significantly inhibited in the Rabeprazole treated group.

Conclusions:

We have demonstrated that Rabeprazole is an effective therapy for reflux esophagitis after total gastrectomy due to bile reflux. These results indicate that bile acid, which is inhibited by Rabeprazole, plays an important role in the mucosal damage induced by duodenal reflux and that it can be therapeutic target in patients with reflux esophagitis.

Disclosure: No significant relationships.



P-197

THE LEARNING CURVE AND ERGONOMICS VARIATION OF THORACOLAPAROSCOPIC MINIMALLY INVASIVE ESOPHAGECTOMY FOR ONE SURGEON WITH GUIDANCE OF EXPERIENCED CONSULTANT SURGEON

H. Wang, Y. Shen, M. Feng, Wei Jiang, L. Tan, Q. Wang

Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China

Objectives:

Thoracoscopic minimally invasive esophagectomy (MIE) is popularized for the treatment of esophageal cancer. However It's technically difficult and easy fatigue for beginners. This study described one surgeon's learning curve and ergonomics variation with guidance of an experienced consultant surgeon.

Methods:

From October 2011 to September 2013, thoracoscopic MIE with cervical anastomosis was performed by the same surgeon for 80 cases of esophageal cancer. The patients were divided into four groups: Group A (Case 1st~20th), Group B (21st~40th), Group C (41st~60th) and Group D (61st~80th). Patients' demographics, clinical outcomes and ergonomic evaluation (surgeon's mental effort and physical discomfort) were recorded and analyzed.

Results:

Conversion was needed in 3 cases (2 in Group A and 1 in Group B). No perioperative mortality occurred. No statistically difference was observed in demographics among the four groups. Compared with group A, significant decrease in thoracic operative time (93.5 ± 17.3 min vs. 118.5 ± 31.7 min, $p=0.004$), abdominal operative time (73.0 ± 16.3 vs. 94.0 ± 17.9 min, $p=0.000$), blood loss (197 ± 137 ml vs. 353.8 ± 213 ml; $P=0.009$), morbidity rate (60% vs. 25%, $p=0.025$), scores of Mental Effort Questionnaire (71.8 ± 10.0 vs. 82.8 ± 10.1 , $p=0.001$) and Physical Discomfort Questionnaire (54.0 ± 10.8 vs. 69.8 ± 9.7 , $p=0.000$) was observed in Group B, whereas more lymph nodes were harvested (19.1 ± 3.4 vs. 14.8 ± 2.6 , $p=0.000$). Compared with group B, significant decrease in postoperative hospital stay ($11[8, 25]$ d vs. $13[10, 55]$ d, $p=0.033$), scores of Mental Effort (64.8 ± 10.2 vs. 71.8 ± 10.0 , $p=0.035$) and Physical Discomfort (45.1 ± 12.0 vs. 54.0 ± 10.8 , $p=0.019$) was observed in Group C, whereas more lymph nodes were harvested (22.1 ± 4.2 vs. 19.1 ± 3.4 , $p=0.018$). As to Group D, the clinical outcome and ergonomic scores were similar to Group C.

Conclusions:

The results of this study suggest that at least 20 cases were required to reach the essential competence of thoracoscopic MIE with guidance of experienced consultant surgeon. After accomplishment of more than 40 cases, improved clinical outcome and alleviated ergonomic effect could be achieved.

Disclosure: No significant relationships.

P-198

THE EFFECTS OF PREOPERATIVE ANXIETY STATUS ON SHORT-TERM POSTOPERATIVE COMPLICATIONS IN PATIENTS WITH ESOPHAGEAL CARCINOMAQ. Gao, J. Peng, Y.S. Yang, Long Qi Chen*Department of Thoracic Surgery, West China Hospital of Sichuan University, Chengdu, China***Objectives:**

To assess the anxiety status and its effects on postoperative complications in patients with esophageal carcinoma.

Methods:

Patients with esophageal cancer who were admitted to our department from November 2012 through March 2013 were enrolled prospectively. Those with psychopathy or taking medicine that might cause psychological problems were excluded. The eligible and consent informed patients were assessed by Hamilton Anxiety Scales. The postoperative morbidities were compared, and the influencing factors on preoperative anxiety were analyzed.

Results:

Totally 78 patients were enrolled and 52 (66.67%) had moderate or high anxiety. There were assigned into 'no anxiety' group (anxiety score < 7, n=26), 'moderate anxiety' group (anxiety score 7~13, n=34), and 'high anxiety' group (anxiety score > 14, n=18). The baseline among the 3 groups showed no differences, while the postoperative complications were significant different among groups ($\chi^2=17.904$, $P<0.001$). The morbidity rate in 'moderate' group (1.4%) was much lower than 'no anxiety' group (19.0%) and 'high anxiety' group (26.0%) ($\chi^2=20.677$, $P<0.001$). The influencing factors on preoperative anxiety status were expense type ($P=0.053$), education level ($P=0.018$), the co-morbidity ($P=0.014$), and cancer awareness ($P=0.009$). The critical value of anxiety score for postoperative complications was 17 ($\chi^2=12.538$, $P=0.004$).

Conclusions:

The preoperative anxiety was prevalent in patients with esophageal cancer, especially in those with disease awareness. Patients with high anxiety scale (>17) might prone to postoperative complications while a moderate anxiety scale showed reduced postoperative morbidity.

Disclosure: No significant relationships.



P-199

UNIQUE CASE OF A GIANT HAMARTOMA GROWING ENDOLUMINALLY FROM A HUGELY ECTASIC SEGMENTAL BRONCHUS

Rocco Bilancia, L. Hernandez-Arenas, E. Internullo

Digestive Diseases and Thoracics, Nottingham City Hospital, Nottingham, United Kingdom

Objectives:

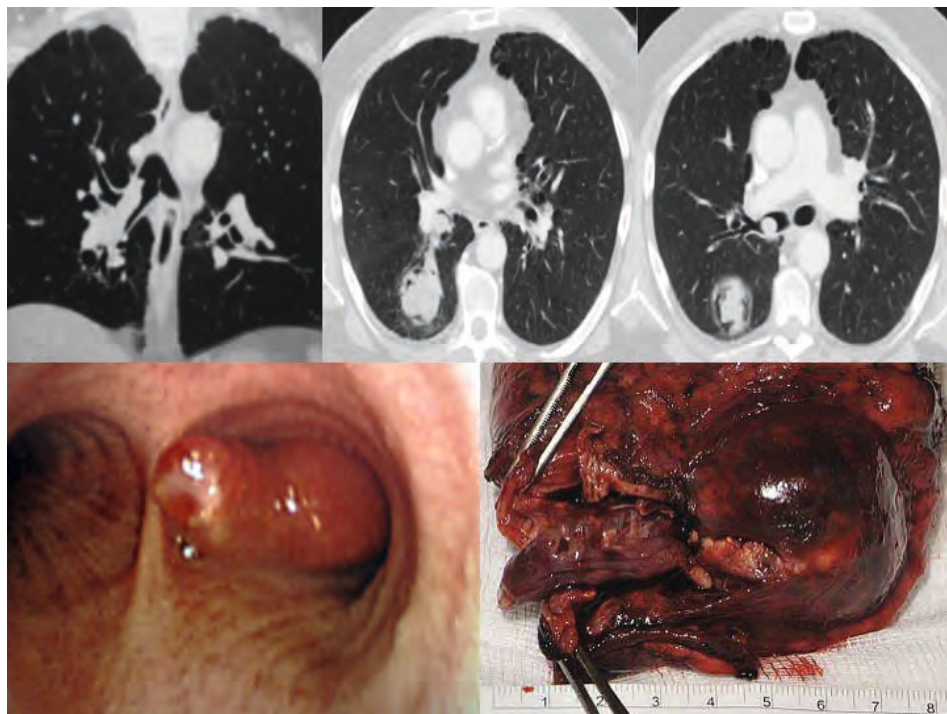
To describe the case of a man with a lung mass, growing endobronchially as a long polypoid lesion from a hugely ectasic segment-6 bronchus up to the carina.

Case description:

A 61-year-old male, ex-smoker with unremarkable past history, complained of dry distressing cough and increasing breathlessness for the previous 3 years, unsuccessfully treated as asthma. CT-scan outlined a cavitation of the right lower lobe segment-6 containing a solid, non-calcific, 45mm mass. An endobronchial lesion occupying the bronchus intermedius up to the carina was also seen. Radiologists hypothesized the endobronchial lesion to have caused post-obstructive phenomena leading to cavitation and fungus ball. At bronchoscopy, an endobronchial cherry-red elongated polyp was partially obstructing the right main bronchus and could be easily passed over and followed until middle lobe bronchus take-off; no clear pedicle was seen. Endobronchial biopsies showed only normal bronchial mucosa. PET-scan was negative. Due to symptoms, size, uncertain diagnosis and endoluminal extension, surgical indication was given. Thoracotomy was performed. Right lower bronchus was cut open: the endobronchial polyp was easily retrieved from within proximal bronchial tree, whilst distally it showed to be surprisingly continuing with the main solid, hard-at-touch segment-6 mass, growing in a hugely ectasic segmental bronchus. Lower lobectomy was therefore completed. At macroscopic examination total length of the lesion -including its endobronchial extension- was 76mm. Final diagnosis on the whole specimen was benign chondroid hamartoma. The patient was discharged without complications after 5 days. Symptoms permanently disappeared after the operation.

Conclusions:

No case has ever been recorded of a giant pulmonary hamartoma growing in an ectasic segmental bronchus in addition with such proximal intrabronchial growth. Management of complex endobronchial masses is challenging and thoughtful intraoperative assessment is key.



Disclosure: No significant relationships.

P-200

LIGHT DOSE PLAYS A CRITICAL ROLE FOR THE DISTRIBUTION OF CHEMOTHERAPY AND TUMOR RESPONSE IN MESOTHELIOMA XENOGRAPTS PRE-TREATED BY PHOTODYNAMIC THERAPY

Xingyu Wang¹, J.Y. Perentes¹, Y. Wang¹, M.A. Le Bitoux², G. Wagnieres³, H. Vandenbergh³, M. Gonzalez¹, H.B. Ris¹, T. Krueger¹

¹Thoracic Surgery, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

²Division of Pathology, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

³Laboratory of Organometallic and Medicinal Chemistry, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

Objectives:

The pre-conditioning of tumor vessels by low-dose photodynamic therapy (L-PDT) was shown to enhance the distribution of chemotherapy in different tumor types. However, how light dose variation affects drug distribution and tumor response is unknown. Here we determined the effect of L-PDT light dose on vascular transport in human mesothelioma xenografts. The best L-PDT conditions were then combined with Lipoplatin™ to determine tumor response.

Methods:

Nude mice bearing dorsal skinfold chambers were implanted with MPM cells. Tumors were treated by Visudyne® (0.4mg/kg) mediated photodynamic therapy with an irradiance of 50mW/cm² and a total light dose of 5J, 10J, 30J and 50J (n=5/group). FITC-Dextran (FITC-D 2MDa) distribution was assessed in real time in tumor and normal tissues. Tumor response was then assessed with best L-PDT conditions combined to Lipoplatin™ (400ug/kg) and compared to controls using repeated caliper measurements and bioluminescence (n=7/group).

Results:

Tumor uptake of FITC-D following L-PDT was significantly enhanced by 10-fold in the 10J, 30J and 50J groups compared to controls. Normal surrounding tissue uptake of FITC-D following L-PDT was significantly enhanced in the 30 and 50J groups compared to controls. Altogether, the FITC-D tumor to normal tissue ratio was significantly higher in the 10J group compared others. Tumor growth and tumor metabolic activity was significantly decreased in the L-PDT 10J + Lipoplatin™ group compared to controls (no treatment, L-PDT and Lipoplatin™ alone).

Conclusions:

Light dose is crucial for the optimal distribution and effect of subsequently administered chemotherapy. These findings are important for the translation of L-PDT in the clinics.

Disclosure: No significant relationships.

P-201

PROTECTIVE EFFECT OF C-TYPE NATRIURETIC PEPTIDE ON LIPOPOLYSACCHARIDE-INDUCED ACUTE LUNG INJURY IN MICE

Toru Kimura¹, T. Nojiri¹, H. Hosoda², Y. Shintani¹, S. Ishikane², M. Inoue¹, M. Miyazato², M. Okumura¹, K. Kangawa²

¹*Department of General Thoracic Surgery, Osaka University Graduate School of Medicine, Suita, Japan*

²*National Cerebral and Cardiovascular Center Research Institute, Department of Biochemistry, Suita, Japan*

Objectives:

Acute lung injury (ALI) is often induced by the mechanical and inflammatory stresses of pulmonary resection surgery. Perioperative management of ALI is therefore an important issue in pulmonary resection surgery. C-type natriuretic peptide (CNP), one of the members of the natriuretic peptide family, including atrial and brain natriuretic peptide (ANP and BNP, respectively), is secreted by vascular endothelial cells. CNP has been shown to exhibit a wide range of vasoprotective effects against pulmonary hypertension and pulmonary fibrosis, including anti-fibrotic, anti-hypertrophic, and anti-inflammatory effects. The objective of the present study was to investigate the prophylactic effects of CNP in an ALI mouse model.

Methods:

C57BL/6 mice were divided into a saline group (control) and a CNP-treated group for an evaluation of early-phase pulmonary inflammation induced by lipopolysaccharide (LPS). At 24 h after an intravenous injection of LPS (1 mg/kg), histopathological and bronchoalveolar lavage fluid (BALF) assessments were performed on the lungs. To count the numbers of neutrophils in the lungs, myeloperoxidase (MPO)-positive staining cells were detected by immunohistochemistry. The BALF cytokine levels were analyzed by an enzyme-linked immunosorbent assay.

Results:

CNP significantly attenuated the elevation of total cell counts and cytokine levels such as monocyte chemoattractant protein-1, tumor necrosis factor-alpha, interleukin-6, chemokine ligand 1, and macrophage inflammatory protein-2 in the BALF of mice after LPS injection. In addition, there were significantly fewer MPO-positive cells in the lung of CNP-treated mice than in control mice.

Conclusions:

CNP had a protective effect on LPS-induced ALI mice accompanied by reducing the infiltration of inflammatory cells. CNP may be of value in prophylactic strategies for ALI following pulmonary resection surgery.

Disclosure: No significant relationships.

P-202

LUNG CANCER BIOBANKING: INTEGRATED APPROACH FOR PRECISION MEDICINE

Francesco Guerrera¹, F. Tabbò², L. Bessone², S. Di Gangi³, L. Buffoni⁴, L. Delsedime⁵, P.L. Filosso¹, A. Oliaro¹, E. Ruffini¹, G. Inghirami⁶

¹*Thoracic Surgery, University of Torino, Italy, Torino, Italy*

²*Department of Molecular Biotechnology and Health Sciences Center for Experimental Research and Medical Science (CERMS), University of Torino, Torino, Italy*

³*Unit of Cancer Epidemiology and Cpo Piedmont, S. Giovanni Battista Hospital, Torino, Italy*

⁴*Dipartimento di Oncologia, Centro Oncologico Ematologico Subalpino (C.O.E.S.), Torino, Italy*

⁵*Department of Pathology, San Giovanni Battista Hospital, Torino, Italy*

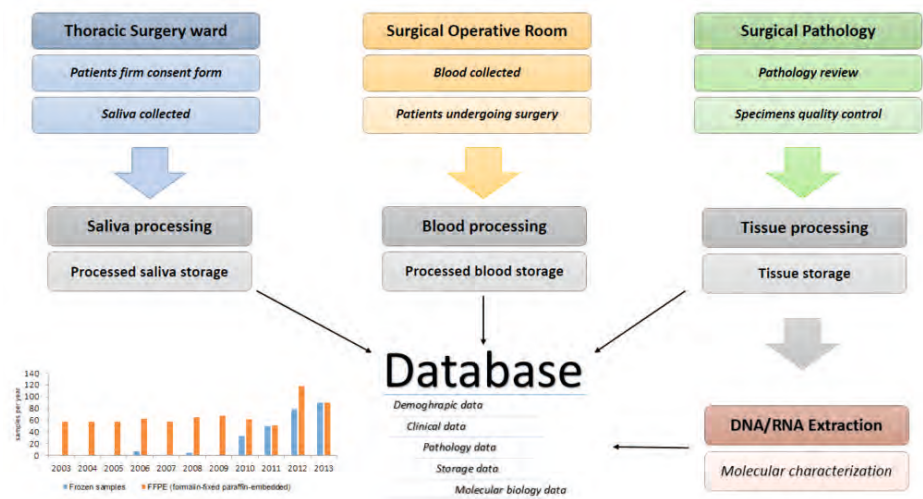
⁶*Department of Pathology and Laboratory Medicine, Weill Cornell Medical College, New York, United States of America*

Objectives:

Non-small cell lung cancer (NSCLC) mortality, despite improved treatment protocols, is discouraging high: ranging from 30% of stage I to 85% of stage IV disease. To prime new progress and insights in lung cancer's research, development of novel molecular analysis is mandatory. To be effective, bio-molecular studies demand access to large clinical series, with high-quality biological samples and associated clinical-epidemiological data.

Methods:

We designed a lung cancer bio-banking protocol, which permitted the collection of tumor specimens matched with normal lung tissues, saliva, peripheral blood mononucleated cells, serum and plasma samples, without undermining routine diagnostic and clinical procedures. To appraise results of our diagram, we evaluated 744 cases of NSCLC submitted to surgery between January 2003 and October 2013 (FIG.1). Tissue analysis was performed on both formalin-fixed paraffin-embedded (FFPE) blocks and frozen tumor samples from our institutional biorepository.



Results:

Our series covered all spectrum of NSCLC histotypes, with a majority of adenocarcinomas (TABLE.1). In addition to histology, all samples were studied by immunohistochemistry, molecular profiling (“hot spot” DNA mutational analysis: EGFR, KRAS, BRAF, PI3K) and a pilot group have been characterized by phospho-proteomic profiling. To assess the quality of specimens, RNA Integrity Number (RIN) and clinical-pathologic characteristics were correlated: none of examined factors negatively affected RNA quality (TABLE.1).

Table.1 Patients characteristics and correlation's results.

<i>Patients</i>	(n - %) 744 (100)	RIN# >=7 60 (52)	RIN < 7 56 (48)	P*
Age (median, iqr)	67 (12)	68 (10)	68.5 (12)	0,83
Gender (male)	511 (69)	41 (68)	38 (68)	0,96
pT				
T1a-T1b	247 (33)	22 (37)	13 (23)	0,22
T2a-T2b	320 (43)	25 (42)	23 (41)	
T3	102 (14)	9 (15)	17 (30)	
T4	53 (7)	3 (5)	3 (6)	
Tis	22 (3)	1 (1)		
pN				
N0	470 (63)	35 (58)	29 (52)	0,53
N1	114 (15)	9 (15)	13 (23)	
N2	137 (18)	15 (25)	14 (25)	
N3	1 (1)	-	-	
NX	22 (3)	1 (2)	-	
pTNM Stage				
IA	132 (28)			
IB	130 (26)			
IIA	68 (14)			
IIB	37 (7)			
IIIA	106 (21)			
IIIB	3 (1)			
IV	23 (5)			
Grading (N=717)				
G1	78 (11)	1 (2)	2 (4)	0,76
G2	405 (56)	30 (53)	29 (55)	
G3	234 (33)	26 (45)	22 (43)	
Istologic type				
Adenocarcinoma	641 (86)	42 (70)	40 (72)	0,42
Squamous	75 (10)	13 (22)	11 (20)	
Large cells	11 (1)	3 (5)	1 (1)	
Other NSCLC	12 (2)	1 (2)	4 (7)	
Combined	4 (1)	-	-	
SCLC	1 (1)	1 (2)	-	
Tumor size (median, iqr)	3 (2)	2,6 (1)	3 (3)	0,13
Vascular invasion (present)	358 (62)	24 (71)	24 (77)	0,53
Resection Status (N=643)				
R0	638 (98)	56 (48)	60 (52)	
R1	4 (1)			
R2	1 (1)			
TIL§ (present)	346 (57)	47 (98)	38 (95)	0,45

RNA Integrity Number

* Chi-square test

§ tumor infiltrating lymphocyte

Conclusions:

To explore patho-biological processes in cancer development and transfer the new discoveries in personalized medicine, common efforts between clinical and basic researchers are needed. Our experience suggesting that a biobanking protocol is a feasible and exportable approach, providing high-quality human tissue samples for high-level next-generation research.

Disclosure: No significant relationships.

P-203

QUANTITATIVE DETERMINATION OF EGFR GENE ABERRANT METHYLATION IN NON SMALL CELL LUNG CANCER: A COMPARATIVE ANALYSIS IN TUMOR TISSUE, NORMAL LUNG TISSUE, PERIPHERAL BLOOD, SPUTUM AND BRONCHIAL ASPIRATE

Roberto Mongil¹, M. Cobo², M.V. Gálvez¹, E.J. Bermejo¹, C. Pagés¹, R. Arrabal¹

¹*Thoracic Surgery, Hospital Regional Universitario, Malaga, Spain*

²*Medical Oncology, Hospital Regional Universitario, Málaga, Spain*

Objectives:

To compare aberrant methylation in the promoter area of EGFR gene in patients (p) with NSCLC, correlating these with clinical variables.

Methods:

DNA was extracted from Sputum (S), blood (B) and bronchial aspirate (BS) from p with NSCLC before surgery and resected lung tumor tissue (TT) and normal lung tissue (NT). Methylation patterns were analyzed by bisulfite conversion and pyrosequencing. Three CpG islands were analyzed in the promoter region of EGFR gene.

Results:

43p, 35 men, 8 women. Histology: 26 adenocarcinoma, 14 squamous and 3 others. 4p non-smokers, 21p former smokers and 18p smokers. Significant differences in methylation percentage (%Mth) were observed between TT and S as follows: CpG2 (11.8 vs 7.1, $p=0.008$), CpG3 (10 vs 7.4, $p=0.037$) and in overall promoter area (10.6 vs 7.6, $p=0.034$). The %Mth was higher in women vs men in TT CpG1 island (16.2 vs 24.9, $p=0.042$) and TT CpG2 island (15.8 vs 26.5, $p=0.013$). The %Mth was higher in squamous histology compared to adenocarcinoma in NT CpG2 island (22.6 vs 14.1, $p=0.017$) and S CpG1 island (13.7 vs 8.2, $p=0.047$). The %Mth was higher in the overall promoter area of adenocarcinoma respect to squamous histology (19.7 vs 12.8 TT, $p=0.042$). The %Mth was higher in overall promoter area of NT respect stage I vs II vs III (22.4 vs 13 vs 17.5, $p=0.03$). The %Mth was higher in former smokers compared to current smokers and non-smokers in NT CpG3 (22.8 vs 13 vs 14.1, $p=0.032$). The %Mth in NT CpG3 was higher in never smokers and former smokers >5 years, respect to smokers and former smokers > 5 years (23.3 vs 15.8, $p=0.05$).

Conclusions:

EGFR aberrant hypermethylation was higher in TT respect to S, with no correlation with EGFR mutation. The %Mth in NT was higher in non-smokers and former smokers > 5 years p.

Disclosure: No significant relationships.

P-204

BALLISTIC TRAUMA: ANATOMICAL LINGUECTOMY ON EXTRACORPOREAL MEMBRANE OXIGENATION (ECMO)

Carlo Curcio¹, D. Casazza¹, D. Amore¹, A. Maiorino¹, N. Mattei²

¹*Thoracic Unit, Monaldi Hospital, Naples, Italy*

²*Intensive Care Unit, Monaldi Hospital, Naples, Italy*

Objectives:

Usually firearm-related thoracic injuries are successfully managed with tube thoracostomy. Pulmonary resection is rarely required to control bleeding. Both pulmonary injury and massive blood transfusion can lead to acute respiratory distress syndrome (ARDS). The use of ECMO can be started as rescue therapy. We report a case of a linguectomy performed in ECMO.

Case description:

A 26-year-old man was admitted to our ICU for bleeding shock and respiratory failure due to left lung firearm injury (bullet passes completely through the body) with pneumo-emothorax. At the admission and after the positioning chest drainage he has HB 5g/l. The patient underwent massive blood transfusion (> 10 units). The patients underwent surgery to perform bleeding control suturing an intercostal artery and of the entrance and exit wounds on lung parenchyma. After initial stability during the first 48h the respiratory status deteriorated with a conclamete ARDS status; we decided to apply femoral-jugular vv-ECMO. On day 6 of ECMO support, the patient developed hemothorax and shock: surgery was needed for bleeding complication and we performed an anatomical linguectomy. After respiratory and hemodynamic postoperative stabilization on day 9 from the anatomical linguectomy we removed basal chest tube and the ECMO system was disconnected. After 5 days from ECMO disconnection the patient was discharged from ICU and admitted to our Thoracic Unit. Apical chest tube was removed on day 16 and the patient was discharged from our Unit on day 19.

Conclusions:

ECMO is currently being used to treat reversible respiratory or cardiac failure. The incidence of patients on ECMO requiring thoracic surgery is low and performing a thoracotomy in a patient on ECMO is particularly hazardous as there is an increased risk of bleeding; however ECMO represents a rescue therapy in severe trauma patients with concomitant chest injury suffering from refractory ARDS when conventional therapies have been exhausted.

Disclosure: No significant relationships.

P-205

NON-INVASIVE DIFFERENTIAL LUNG NODULE DIAGNOSIS USING A STANDARDIZED UPTAKE VALUE INDEX

Satoshi Shiono¹, N. Yanagawa², M. Abiko¹, T. Sato¹

¹*Department of Thoracic Surgery, Yamagata Prefectural Central Hospital, Yamagata, Japan*

²*Department of Pathology, Yamagata Prefectural Central Hospital, Yamagata, Japan*

Objectives:

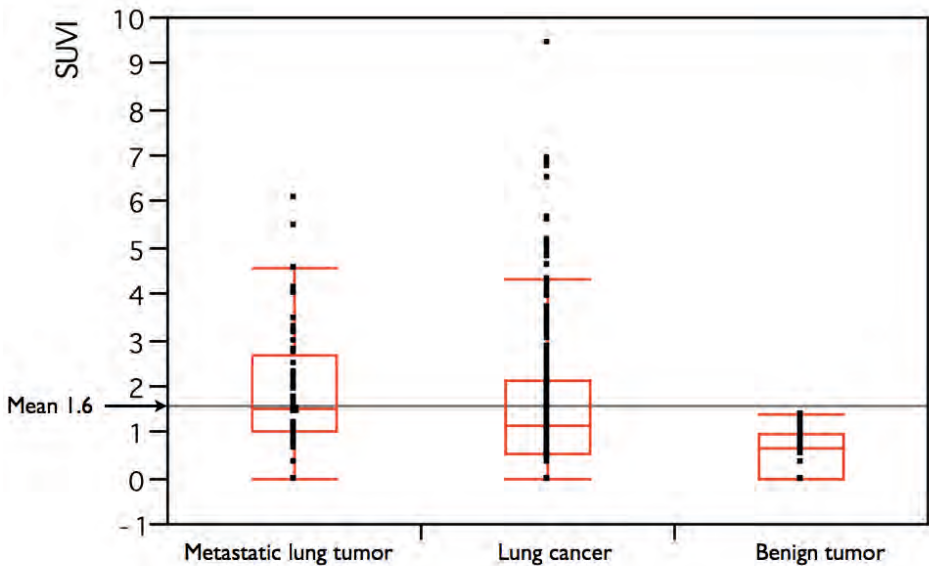
Before surgery, a definitive diagnosis of peripheral small lung nodules is difficult. We previously found that a corrected standardized uptake value (SUV), defined as the tumor SUV_{max} to liver SUV_{mean} ratio, was an SUV index and was a significant surrogate marker of lung cancer aggressiveness. In this study, we investigated if this SUV index could differentiate lung malignancies from peripheral small lung nodules and be a prognostic factor for lung malignancy.

Methods:

From May 2004 to December 2013, 284 patients with lung nodules of ≤ 2 cm underwent PET/CT examinations and surgery. We assessed associations between pathological findings and several clinical factors, including the SUV index. For those with lung cancer, invasive lung cancer was defined as lymphovascular invasion, pleural invasion, or lymph node metastasis. Receiver operating characteristic curve analysis was used to determine an appropriate SUV index cut-off value.

Results:

Lung cancer was found for 198 patients; 56 had metastatic lung tumors, and 30 had benign tumors. Median SUV index values were 1.2 with lung cancer, 1.5 with metastatic lung tumors, and 0.6 with benign tumors ($p < 0.01$). To distinguish between malignant and benign tumors, the SUV index cut-off was 1.27, and was 1.28 to identify invasive lung cancer. When patients were divided into those with SUV indices of < 1.2 or ≥ 1.2 , overall survival with lung malignancies was significantly better for the < 1.2 index group. Five-year survival rates for these groups were 91.0% and 84.3% with lung cancer ($p = 0.03$) and 94.1% and 37.6 with metastatic lung tumor ($p = 0.01$), respectively.



Conclusions:
The SUV index was useful for distinguishing benign tumors from malignancy. Patients with SUV indices of < 1.2 will likely have a good outcome, even with metastatic lung tumors.

Disclosure: No significant relationships.

P-206

NEGATIVE PRESSURE WOUND THERAPY. A NOVEL ADJUNCT IN THE TREATMENT OF POST-OPERATIVE SEVERE SURGICAL EMPHYSEMA

Ralitsa Hristova¹, C. Bogdan¹, K. Kostopanagiotou², K. Vachlas¹, E. Kefaloyannis¹, R. Milton¹, K. Papagiannopoulos¹, N. Chaudhuri¹

¹Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

²2nd Department of Cardiac Surgery, Onaseio, Athens, Greece

Objectives:

Surgical (or subcutaneous) emphysema (SE) is a well-recognized complication after thoracic surgical procedures and apart from causing severe distress to the patient can also prolong hospital stay. Surgical blow-holes are sometimes used as an adjunct in the management of this condition. We evaluated the additional application of negative pressure wound therapy to the blow-hole to accelerate resolution of symptoms.

Methods:

Six patients (4 male and 2 female) underwent vacuum-assisted closure (VAC) dressing applied to an approximately 3-cm infraclavicular “blowhole” incision following extensive post-operative SE. Five patients had a procedure for an underlying malignancy: Video Assisted Thoracoscopic Surgery (VATS) Lobectomy - 2, Thoracotomy and Repair of Broncho-oesophageal fistula after Ivor Lewis Oesophagectomy - 1, Radio-frequency Ablation (RFA) of Pulmonary Metastasis - 1 and VATS and Insertion of Pleurx drain - 1. The remaining patient had undergone VATS Lung Volume Reduction Surgery. Most of the patients had background emphysematous Lung. The median age was 67.1 years (range 60-81). Bilateral “blowhole” incisions and unilateral VAC insertion were performed in four patients. In 2 patients we used a unilateral approach. All patients had a chest drain in situ in order to ensure additional adequate control of the underlying airleak from the lung.

Results:

Dramatic reduction of the subcutaneous surgical emphysema in five patients occurred within 24 hours following the VAC therapy. Complete resolution of the neck compression, facial swelling and impaired vision was achieved within the first 24 hours in these patients. In the remaining patient with SE following RFA, the blowhole had to be enlarged and deepened before a similar result was obtained.

Conclusions:

The addition of topical Negative Pressure Wound Therapy Dressing is a novel and effective adjunct in the management of extensive SE following thoracic surgical procedures. It results in vastly accelerated resolution of the severely distressing symptoms in this condition.

Disclosure: No significant relationships.

P-207

EPIDURAL VS PARAVERTEBRAL ANALGESIA IN THORACOTOMY PATIENTS: A RANDOMIZED, PROSPECTIVE STUDYFederico Raveglia¹, A. Rizzi¹, P. Di Mauro², D.G. Moro², A. Leporati¹, U. Cioffi³, A. Baisi³¹Thoracic Surgery, AO San Paolo, Milan, Italy²Anesthesiology and Critical Care, AO San Paolo, Milan, Italy³Thoracic Surgery, University of Milan, Milan, Italy**Objectives:**

pain control after thoracotomies prevents complications and improves respiratory function. The gold standard is epidural catheter (EP). In 2013 we published early results comparing EP with a technique involving placement of a catheter in the paravertebral space. To improve the value of the study we now present an update of the study with a wider patient population in order to improve its value.

Methods:

from November 2011 to July 2013, seventy-one patients were randomized into two groups depending on site of catheter placement: epidural for group A and paravertebral for group B. The catheter (Contiplex[®] Tully Set, B-Braun) was placed by the same surgeons tunneling parietal pleura and entering paravertebral space before thoracotomy closure. At 6, 12, 24, 48 and 72 hours after surgery, the following parameters were recorded: (a) pain control using (b) respiratory function using forced expiratory volume in one second (FEV1) and ambient air saturation and (c) blood cortisol values as systemic reaction to pain. Records were analyzed with Mann-Whitney or Student's tests.

Results:

statistically significant differences ($P < .05$) have been found in favor of group B concerning both cough and rest pain control ($p = .0021$ and 0.002 respectively) and respiratory function in terms of FEV1 and ambient air saturation ($p = 0.0231$ and 0.001). No significant differences have been found in blood cortisol trends ($p > 0.05$) (Table 1). No complications after placement were recorded in both groups. Collateral effects such as vomit, nausea, low pressure or urinary retention have been observed in 28 of 34 patients belonging to group A.

Parameters	-24h		6h		12h		24h		48h		72h		P+
Vas rest			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	0,002*
			5,92	1,269	4,62	1,540	3,60	1,572	2,98	1,545	2,78	1,608	
			Median	Range	Median	Range	Median	Range	Median	Range	Median	Range	
Vas Cough			6,00	2-8	5,00	1-7	4,00	1-7	3,00	1-7	2,00	1-7	0,0021*
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
			6,11	1,276	4,91	1,65	3,64	1,665	3,10	1,709	2,87	1,687	
Cortisol			Median	Range	Median	Range	Median	Range	Median	Range	Median	Range	0,08
			6,00	2-9	5,00	1-8	4,00	1-7	3,00	1-7	2,00	1-7	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
O2 sat %			17	4,42	13,76	3,600	11,85	3,789	9,42	2,387	8,00	2,456	0,001*
			Median	Range	Median	Range	Median	Range	Median	Range	Median	Range	
			18,00	5-22	14,00	6-22	11,00	5-20	9,90	5-16	8,00	4-14	
FEV 1			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	0,0231*
			96,77	1,387	92,35	3,050	94,26	2,059	94,93	1,959	96,13	1,546	
			Median	Range	Median	Range	Median	Range	Median	Range	Median	Range	
			97,00	93-99	93,00	81-96	95,00	89-98	95,00	90-98	96,40	93-99	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
			79,63	10,724			47,62	10,233	52,60	11,918	56,27	10,672	
			Median	Range			Median	Range	Median	Range	Median	Range	
			83,00	51-95			45,00	33-76	50,00	39-79	57,00	39-81	

Conclusions:

Results of this update were consistent with our previous study. Extended data strengthen the evidence that drugs administered through a catheter in the paravertebral space are very effective. This technique does not present collateral effects. Moreover there are no contraindications to its positioning.

Disclosure: No significant relationships.

P-208

DETERMINING OPTIMAL FLUID AND AIR LEAK CUT OFF VALUES FOR CHEST DRAIN MANAGEMENT

Miguel Mesa-Guzman¹, L. Socci¹, Z. Niwaz², P. Pericleous¹, H. Raubenheimer¹, F. Di Chiara¹, B. Adams¹, L. Gurung¹, M. Uzzaman¹, E. Lim¹

¹*Thoracic Surgery, Royal Brompton & Harefield NHS Foundation Trust, London, United Kingdom*

²*Quality and Safety, Royal Brompton & Harefield NHS Foundation Trust, London, United Kingdom*

Objectives:

Chest drain duration is one of the most important influencing aspects of hospital stay but the management is perhaps one of the most variable aspects of thoracic surgical care. The aim of our study is to report outcomes associated with increasing fluid and air leak criteria of protocol based management.

Methods:

A six year retrospective analysis of protocolised chest drain management starting in 2007 with a fluid criteria of 3ml/kg increasing to 7ml/kg in 2011 to no fluid criteria in 2012, and an air leak criteria of 24hrs without leak till 2012 when digital air leak monitoring was introduced with a criteria of <20ml/min of air leak for more than 6hrs. Patient data were obtained from electronic hospital records and digital chest films were reviewed to determine the duration of chest tube drainage and post-drain removal complications.

Results:

From 2009 to 2012, 626 consecutive patients underwent thoracic surgery procedures under a single consultant. A total of 160 did not require a chest drain and data was missing in 22, leaving 444 for analysis. The mean age (SD) was 57 (19) years and 305 (62%) were men. There were no differences in the incidence of pneumothoraces (P=0.06), effusion (P=0.10) or re-interventions (P=0.49) for drain re-insertions as progressively permissive criteria were applied.

Year	Fluid criteria	Free from air leak	Length of drain (median-days)	Length of stay (median-days)	Intervention n(%)
2009	5ml/kg	>24hrs	3	6	3(2)
2010	6ml/kg	>24hrs	2	5	2(2)
2011	7ml/kg	>24hrs	3	5	3(3)
2012	N/A	<6hrs	1	3.5	5(5)

Conclusions:

Our results show that chest drains can be safely removed without fluid criteria and air leak of less than 20ml/min with median drain duration of 1 day.

Disclosure: No significant relationships.

P-209

THE ADDED VALUE OF THE VIVASIGHT® DLT FOR VATS: A PERFORMANCE AND COST-EFFECTIVENESS ANALYSIS

Alexander Pothof, P.J. Van Huijstee, W.H. Steup, J.A.M. De Haas, H. Uiterwijk
Heelkunde, Haga Ziekenhuis, The Hague, Netherlands

Objectives:

Reliable unilateral lung ventilation with a double lumen tube (DLT) is of great importance for video assisted thoracic surgeries (VATS). With the classic DLT, fiberoptic control of the correct placement of the tube is needed at intubation, after positioning and during surgery. However, this takes time and can only be done in intervals. Recently, the Viva Sight® DLT was introduced, a device with a built in camera system. Thus, providing continuous monitoring of the position of the DLT from the moment of intubation. We compared intubation and positioning times and length of surgery of the classic DLT combined with the fiberoptic to the Viva Sight® DLT with continuous airway monitoring. In addition, we analyzed the per patient costs of both methods.

Methods:

A retrospective analyses of intubation type and surgery times for all VATS patients operated between 25-06-2012 and 25-11-2013 at the Haga Hospital, The Hague.

Results:

In total, 201 patients were operated for VATS, 101 by Viva Sight® DLT and 100 by DLT with fiberoptic. We found a significant difference in the time needed to secure reliable unilateral lung ventilation, with an average 25 minutes for the Viva Sight® DLT and 32 minutes ($p < 0.001$). The per patients costs for the Viva Sight® DLT were € 135,-, and ranged from € 163,- to € 278,- for DLT with fiberoptic, depending on the need for a bronchial blocker. Thus, the Viva Sight® DLT resulted in a per patient cost reduction ranging from 17.2% to 88.2% (€ 28,- – € 143,-).

Conclusions:

Objectively the Viva Sight® DLT resulted in significant decrease in the time needed to secure reliable unilateral lung ventilation when compared to the classic DLT with fiberoptic. This was done with a considerable reduction of the per patient costs compared to fiberoptic or bronchial blocker. Subjectively there was a greater surgeon satisfaction.

Disclosure: No significant relationships.

P-210

PEZZER DRAIN VS POLYETHYLENE CHEST TUBE AFTER UPPER LOBECTOMY: A RANDOMIZED PROSPECTIVE STUDYC. Atinkaya Ozturk¹, V. Baysungur¹, Elcin Ersoz¹, M. Kavas²¹*Thoracic Surgery, Sureyyapasa Chest Disease Research and Training Hospital, Istanbul, Turkey*²*Chest Disease, Sureyyapasa Chest Disease Research and Training Hospital, Istanbul, Turkey***Objectives:**

Apical residual air space and prolonged air leak are common complication contributing to prolonged hospitalization following resection of upper lobe of the lung. The objective of the study was to compare in a prospective randomized fashion two different management schemes for chest tubes after upper lobectomy: pezzet drain versus polyethylene chest tube.

Methods:

Between 2011 and 2013, 50 patients (mean age 48.3 years) with air leaks associated with residual pleural space (3 cm at chest X-ray) persisting over three days after upper lobectomy were enrolled in this study. Fifty patients with air leak on the morning of the first postoperative day were randomly assigned to two groups: group 1 (pezzet drain), 25 patients; or group 2 (polyethylene chest tube), 25 patients. The groups were then compared in terms of per and postoperative space, complication, hospitalization days, duration of the chest tubes, age, gender and side of the thoracotomy variables.

Results:

Postoperative residual space ($p=0.04$) showed a significant correlation with apical polyethylene tube insertion. The pezzet drain average duration of air leak was 3 days, polyethylene tube average duration of air leak was 5 days. The patients with COPD in Group 2 was observed prolonged air leaks than the patients with COPD in Group 1 ($p=0.04$). Pezzet drain patients showed a reduced incidence of air leak ($p=0.03$), and a shorter postoperative hospital stay ($p=0.01$), a shorter duration of chest tubes in place ($p=0.02$). Age (more than 60 years, $p=0.029$), right thoracotomy ($p=0.01$) did appear as significant predictors for apical residual air space. Empyema and pneumonia were developed in two patients in group 2 after right upper lobectomy.

Conclusions:

Pezzet drain was superior to polyethylene chest tube alone in reducing the incidence of apical residual air spaces and related complications hospital stay after upper lobectomy. It is a safe, simple, cosmetic and low cost procedure.

Disclosure: No significant relationships.

P-211

THE EFFICACY OF CONTINUOUS WOUND CATHETER DELIVERING LOCAL ANESTHETIC FOR CONTROLLING POST-THORACOTOMY PAIN: A RANDOMIZED DOUBLE-BLIND STUDY

Alfonso Fiorelli, R. Milione, A. Izzo, S. Costanzo, E. Frongillo, A. Del Prete, R. Scarumuzzi, G. Smarrazzo, G. Vicidomini, M. Santini

Department of Cardio-thoracic Diseases, Thoracic Surgery Unit, Second University of Naples, Naples, Italy

Objectives:

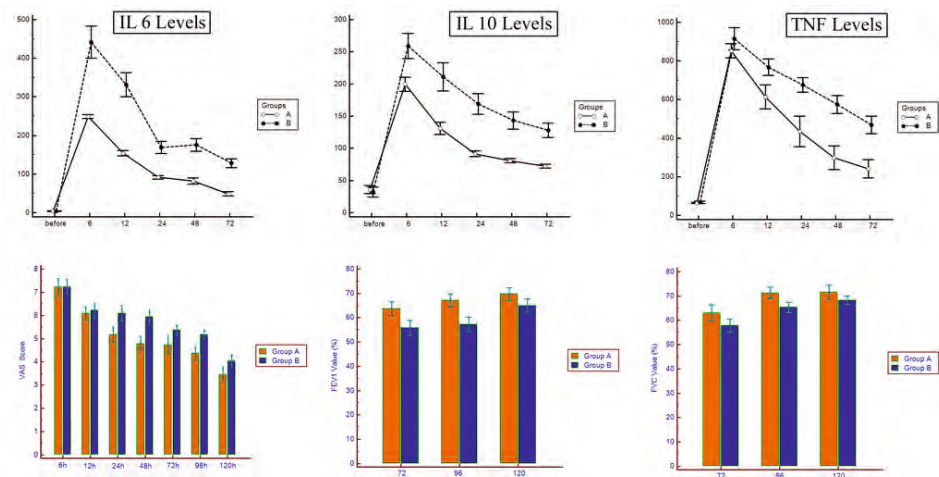
To evaluate if continuous wound catheters delivering local anesthetic as an adjunct to intravenous (IV) patient controlled analgesia (PCA) is a suitable technique for controlling post-thoracotomy pain.

Methods:

In the last two years, 60 patients undergoing resection of lung cancer via thoracotomy were prospectively enrolled and randomized into two groups: Group A received IV PCA plus continuous wound catheter infusion of 0.5% bupivacaine at 10 ml/hour for 48 hours and Group B received IV PCA plus continuous saline infusion. In the postoperative period, the following parameters were assessed: (i) IL-6, IL-10 and TNF- α levels (pg/mL) measured before and 6;12;24;36;48;and 72 hours after operation; (ii) pain level using Visual Analogue Scale (VAS) 6;12;24;36;48; and 72 hours after operation; (iii) FEV1% and FVC% evaluated 72;96;120 days after operation; (iiii) morphine and Ketorolac consumption. Surgeons, anesthesiologists, trainees nurses and patients were blinded. ANOVA test was used to compare variables with repeated measures over time.

Results:

54 patients completed the study (22 in Group A and 22 in Group B). Results are summarized in Figure 1. The IL-6 (sphericity:0.3;p<0.001); IL-10 (sphericity:0.4;p<0.001); TNF- α (sphericity:0.6;p<0.001); and VAS (sphericity:0.7;p<0.001) levels were significant lower in Group A than in Group B. The FEV1 (sphericity:0.5;p=0.01) and FVC (sphericity:0.7;p<0.04) values were significantly better in Group A than in Group B. In Group A versus Group B a significant reduction of morphine (sphericity:1.0;p<0.01) and Ketorolac (sphericity:0.7;p<0.001) consumption were also observed.



Conclusions:
Continuous infusion of local anesthetic trough a wound catheter associated with IV PCA attenuated the proinflammatory response with better recovery of respiratory function and a lower consumption of drugs with decreasing the adverse effects of these drugs. Being simpler and safer to use, it may be a valid alternative to other strategies as intercostal or paravertebral block that are contraindicated in certain patients.

Disclosure: No significant relationships.

P-212

THE DUTCH LUNG SURGERY AUDIT

Martijn Ten Berge¹, W.H. Steup², P.H.J.M. Veldman³, M. Wouters⁴, W.H. Schreurs⁴

¹*Surgical Oncology, Leiden University Medical Center, Leiden, Netherlands*

²*Heelkunde, Haga Ziekenhuis, The Hague, Netherlands*

³*Surgery, Tjongerschans, Heerenveen, Netherlands*

⁴*Surgical Oncology, Antoni van Leeuwenhoek Ziekenhuis, Amsterdam, Netherlands*

Objectives:

The nationwide Dutch Lung Surgery Audit (DLSA) was initiated in 2011 to monitor, evaluate and improve outcomes in all lung surgery in the Netherlands. This outline illustrates the establishment, structure and organization of the audit by the Society of Lung Surgeons of the Netherlands (SLSN) in collaboration with the Dutch Institute for Clinical Auditing (DICA). In addition the results of two years registration are presented.

Methods:

The SLSN initiated a clinical prospective web-based registration of the process of care with 300 data points per patient. Patients undergoing lung surgery are registered by the clinicians themselves. Benchmarked feedback of surgical outcomes is updated weekly for participating hospitals. Participation in the DLSA is compulsory by the healthcare inspectorate in cooperation with the SLSN. Data verification with external data sources is done on annual bases.

Results:

Within two years, 92% of the eligible hospitals with general thoracic surgeons participated, registering a total of 6,970 patients, of which almost half were lung cancer patients. Nationwide there is high guideline compliance and 96% of patients is discussed in a preoperative multidisciplinary meeting. Complication rates (11%) and mortality are low (2,1%). Data verification by comparison with the Netherlands Cancer Registry showed high similarity. The completeness of data still remains an important point of care as well the data input workload for the surgeons.

Conclusions:

Within the first two years the DLSA shows a large involvement of general thoracic surgeons in the Netherlands. This will result in a reliable comparison of surgical outcomes between hospitals, identification of best-practices and nationwide improvement initiatives. In the future, the audit will be expanded with pulmonologists and lung radiotherapists to provide a broad overview of lung cancer treatment. Data will be forwarded to the ESTS Database for international benchmarking.

Disclosure: No significant relationships.

P-213

B-TYPE NATRIURETIC PEPTIDE FOLLOWING THORACIC SURGERY, A PREDICTOR OF POSTOPERATIVE CARDIOPULMONARY COMPLICATIONS

Lucio Cagini¹, M. Andolfi¹, C. Leli², R. Potenza¹, A. Matricardi¹, E. Scarnecchia¹, J. Vannucci¹, R. Rodseth³, F. Puma¹

¹Department of Surgery, Thoracic Surgery Unit, University of Perugia, Perugia, Italy

²Department of Experimental Medicine and Biochemical, Microbiology Section, University of Perugia, Perugia, Italy

³Department of Anaesthetics, Inkosi Albert Luthuli Central Hospital, Perioperative Medicine and Surgical Research Unit, Mandela School of Medicine, University of KwaZulu-Natal, Congella, South Africa

Objectives:

B-type natriuretic peptides (BNP) are secreted by the human heart in response to ventricular wall stretch or myocardial ischemia, and predict adverse cardiovascular events and death in the general population. Following noncardiac surgical procedures there is growing evidence supporting BNP measurement as a powerful independent predictor of death and perioperative complications. However, the clinical implication of elevated BNP measurements after pulmonary resection, has not been completely defined. This study aimed to evaluate the role of BNP in predicting adverse cardiopulmonary events after thoracic surgery.

Methods:

Prospective, short-term, observational cohort study in a tertiary care hospital, including consecutive patients undergoing scheduled pulmonary resection between April 2012 and October 2013. Baseline clinical details were obtained, serum BNP levels were measured at baseline and on postoperative day 1 and 4.

Results:

We enrolled 294 consecutive patients, median age 66 (IQR-57-73), 67% male. There were 2 perioperative deaths, and 52 patients experienced one or more cardiopulmonary complications. The baseline median BNP value was normal (29.5 pg/mL, IQR-16-57.2), and showed significant postoperative increase, peaking on day 1. Patients who developed postoperative complications had a significantly greater BNP increase ($P<0.0001$) as compared to those without complications (Fig. 1). A postoperative day 1 BNP measurement ≥ 118.5 (ROC area=0.654; 95%CI=0.57-0.74; $P=0.001$) was associated with a threefold risk of developing postoperative cardiopulmonary complications (OR 2.94; 95% CI:1.32-6.57; $P=0.008$). Logistic regression analysis showed major pulmonary resections (lobectomies and pneumonectomies), $\text{BNP} \geq 118.5$, and age ≥ 65 to be the only independent predictive variables. In the subset of patients undergoing lobectomy or pneumonectomy ($n=233$) BNP was the strongest independent predictor of complications (OR 3.49; 95% CI:1.51-8.04).

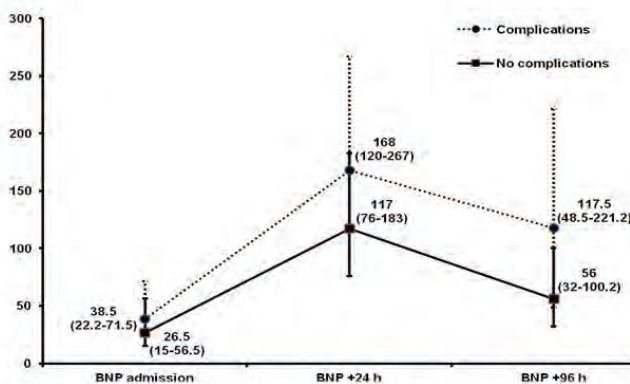


Figure 1. Comparison of postoperative BNP measurements between patients with postoperative complications and those without complications ($P<0.0001$).

Conclusions:

Our results show that BNP elevation, measured in the first days after thoracic surgery, is independently associated with postoperative adverse events. In patients undergoing major pulmonary resections a postoperative BNP elevation is the strongest independent predictor of cardiopulmonary complications.

Disclosure: No significant relationships.

P-214

VIDEOASSISTEDTHORACOSCOPICPULMONARYWEDGERESECTIONWITH OR WITHOUT A CHEST TUBE?

B. Steunenbergh, H. De Groot, P. Romme, C. Boot, Eelco Veen,
Surgery, Amphia Hospital, Breda, Netherlands

Objectives:

There has been debate about the need of using a chest tube after video-assisted thoracoscopic (VATS) wedge resection. A chest tube could negatively influence the post-operative course and diminish the possible benefits of VATS. The aim of this study was to evaluate the safety of post-operative management without chest tube placement.

Methods:

Between January 1999 and November 2013 85 pulmonary wedge resections by VATS were performed in our hospital. Nineteen patients were excluded which did not meet the criteria leaving 64 patients for analysis. A new protocol for chest tube management was developed at the beginning of 2011. We decided that if there was no air leak after performing the intraoperative air leak test a chest tube was omitted. These patients were compared with a retrospective cohort before 2011 in which standard a chest tube was placed after pulmonary wedge resection. The primary endpoint was hospital stay, the secondary endpoint was post-operative morbidity.

Results:

Twenty eight patients were enrolled in the without a chest tube group and 36 in the group with a chest tube after VATS wedge resection. Patient characteristics were equal between the two groups except for coronary artery disease in the previous history in the patients with a chest tube. There was no significant difference in post-operative morbidity between the two groups, however the hospital stay was significant shorter in the group without a chest tube. (3 versus 5 days: $p < 0.05$)

Conclusions:

In performing thoracoscopic pulmonary wedge resection a chest tube can safely be omitted with a negative perioperative air leak test and may reduce the hospital stay.

Disclosure: No significant relationships.



P-215

NEW GENERATION VESSEL SEALING SYSTEM FOR PULMONARY ARTERY PROCESSING

Tetsu Yamada, T. Sowa, H. Motoyama, T. Kondo, M. Takahashi, K. Hijiya, T. Bando, K. Ohata, H. Date

Department of Thoracic Surgery, Graduate School of Medicine, Kyoto University, Kyoto, Japan

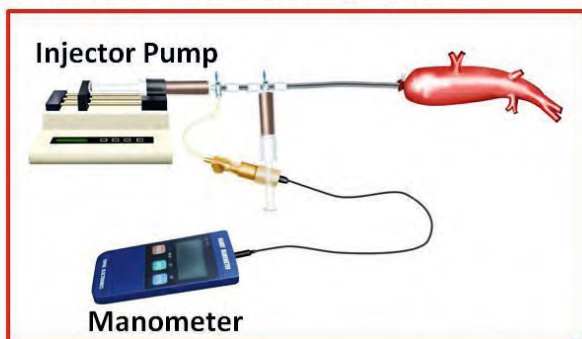
Objectives:

In video-assisted thoracoscopic surgery, the development and utilization of endoscopic surgical instruments to process small pulmonary arteries will facilitate the safety. The objectives of this experimental study is to evaluate the feasibility and safety in processing pulmonary arteries with new generation EnSeal technology, which is recently upgraded for more effective tissue sealing with higher hemostatic effect than conventional devices.

Methods:

Beagle dogs, mean body weight 11.2 Kg (10.9 – 11.4 Kg), and a tissue sealing device, new EES Generator GEN11, EnSeal G2 Tissue Sealers were used in this study. Left lower lobectomy was performed on 8 dogs in which 16 parts of pulmonary arteries were processed with EnSeal and 8 parts with ligation. At the time of sacrifice after survival period, right pulmonary artery branches were exposed and processed in vivo 48 parts with EnSeal and 9 parts with ligation, then extracted to evaluate the pressure resistance at the sealed end. While measuring the intra-vascular pressure with a manometer, physiological saline solution was infused into the vessel up to 75 mmHg of pressure. Diameters and sealing outcomes for each sealed pulmonary artery were recorded (Figure-1).

Intravascular Pressure Monitoring System



At 25 mmHg



At 50 mmHg



At 75 mmHg

Results:

Dogs were scarified for pathological evaluation on sealed ends of pulmonary arteries, 4 dogs each after 1 and 7 weeks of survival period. No sealing failure was found and pathological findings showed healing process and persistent hemostasis at sealed ends of pulmonary arteries. Pressure resistances at the sealed ends were evaluated in all parts of processed pulmonary arteries. All sealed ends showed pressure resistance higher than 75 mmHg, except for one end 5 mm in diameter burst at the pressure of 73 mmHg.

Conclusions:

Pulmonary arteries processing with new generation EnSeal technology showed sufficient pressure resistance in acute phase and safety in left lower lobectomy with persistent hemostasis after 1 or 7 weeks of survival period.

Disclosure: T. Yamada: Research funding has been received from Ethicon Endo-Surgery Japan, Johnson & Johnson K.K.



P-216

CONCURRENT ROBOTIC-ASSISTED RIGHT UPPER LOBECTOMY FOR LUNG CANCER AND ROBOTIC-ASSISTED EXCISION OF ESOPHAGEAL LEIOMYOMA: A CASE REPORT

Eric Toloza¹, C.C. Moodie¹, J. Garrett¹, K. Meredith²

¹Thoracic Oncology, Moffitt Cancer Center, Tampa, United States of America

²Gastrointestinal Oncology, Moffitt Cancer Center, Tampa, United States of America

Objectives:

Stage-I lung cancer is primarily treated by surgical resection, preferably via minimally-invasive surgery (MIS). Symptomatic esophageal leiomyomas should be surgically resected, also preferably via MIS. We report the first known case of robotic-assisted pulmonary lobectomy concurrent with robotic-assisted excision of esophageal leiomyoma.

Case description:

A 41-year-old woman was diagnosed with a 2-cm right upper lobe (RUL) lung adenocarcinoma. Preoperative review of symptoms revealed dysphagia to liquids and solids. Preoperative positron-emission tomography (PET) scan confirmed the RUL lung mass to be PET-positive as well as a PET-negative nodule within the upper esophageal wall. She subsequently underwent robotic-assisted video-thoroscopic right upper lobectomy (RULobectomy), with mediastinal lymph node (LN) dissection, performed in left lateral decubitus via 3 thoracoscopy ports. After the RULobectomy and mediastinal LN's were resected, the patient underwent through the same thoracoscopy ports a concurrent robotic-assisted video-thoroscopic excision of an esophageal leiomyoma, confirmed on frozen section. Total operative (skin-to-skin) time was 275 min, with no intraoperative complications. Total intraoperative estimated blood loss was 125 mL. Esophagram on postoperative day (POD)#1 revealed no evidence of esophageal leak, and she was able to advance to regular diet by POD#2. Chest tube was removed on POD#4, and she was discharged to home. Pathology revealed a 1.5-cm moderately-differentiated RUL adenocarcinoma, with negative margins and 11 negative interlobar, hilar, and mediastinal LNs, as well as the 2.5-cm esophageal leiomyoma. She has had no further complaints of dysphagia, and serial surveillance chest CT scans over 18 months has revealed no evidence of recurrent or metastatic lung cancer.

Conclusions:

We report the first successfully performed robotic-assisted pulmonary lobectomy for lung cancer concurrent with robotic-assisted excision of esophageal leiomyoma, especially through the same thoracoscopy ports.

Disclosure: E. Toloza: Proctor and observation site for Intuitive Surgical and the daVinci robotic system

K. Meredith: Proctor and observation site for Intuitive Surgical and the daVinci robotic system

P-217

PERIAREOLAR VIDEO-ASSISTED THORACOSCOPIC APPROACHElisabet Arango Tomas, F. Cerezo Madueño*Thoracic Surgery and Lung Transplantation Unit, Reina Sofia University Hospital, Cordoba, Spain***Objectives:**

Describe a new minimally invasive as well as aesthetic approach for thoracoscopic lung resections, bullectomies, and mediastinal tumor resections.

Methods:

From January to November 2013, we performed 20 surgeries using the periareolar approach. Demographic and preoperative patient characteristics (Table-1). The patient is positioned in semilateral-decubitus (almost supine) to enable a VATS approach using an external periareolar incision (inferolateral and inferomedial quadrants) encompassing 50% of the circumference of the areola. Operating table mobilization modifies and improves field exposure. It's possible to move the areola with tapes. A camera-port was placed at the seventh intercostal space in the anterior axillary line. Thoracoscope: 10-mm, 120-degree angle.

Variable	Mean \pm SD (range) or N°. (%)
Age	56.6 \pm 20.3
Sex	
- Male	20 (100 %)
- Female	0 (0 %)
Smoking history	
- Yes	13 (65 %)
- No	7 (35 %)
Comorbidity	
- COPD	5 (25 %)
- Cardiovascular risk factor	4 (20 %)
- Cardiac disease	3 (15 %)
- Previous cancer	2 (10 %)
- Previous operation	4 (20 %)
- Other diseases	8 (40 %)
Injury	
- Pneumothorax	10 (50 %)
- Mediastinal Tumor	2 (10%)
- Pulmonary Mass	8 (40 %)
Pulmonary function (for NSCLC patients)	
- Forced expiratory volume in 1 second (%)	65.1 \pm 11.8 (48-84)
- Vital capacity (%)	73.0 \pm 16.8 (57-105)

Results:

There were 8 major-resections, 10 sublobar-resections, and 2 mediastinal tumor resections. We used the main periareolar wound to remove the resected specimen in 16 cases. In our experience for lobes, this is possible only when we performed an intra-operative biopsy of the nodule, when it's an upper lobe, when we cut the specimen in two parts, or when we do a prior decompression of the specimen retrieval bag with an Abocath. It was necessary expanding the camera-port in 4 cases. Postoperative was uneventful and the patients were discharged on the 2.5 postoperative day. In the follow-up, there were a case of periareolar pain, a subcutaneous emphysema, and a pneumothorax. Significant associations were observed between complications and: age ($p<0.000$), type of lesion ($p<0.024$), and lobectomy ($p<0.002$).

Conclusions:

Periareolar incision offers not only easy access and satisfactory aesthetic results with respect to classical incisions, it's also a technique without difficulty for the surgeon and comfortable for the assistant who is separated from him. The wider breadth and greater elasticity of the costal arches in the anterior thoracic region allows an insertion of several instruments into the chest, without interfering with the optical's direction, also the use of traditional long instrumental.

Disclosure: No significant relationships.

P-218

A NOVEL MODEL FOR VATS LUNG NODULE PALPATION

Zeynep Bilgi¹, H. Omercikoglu¹, C. Cetinkaya¹, B. Sayan¹, K. Bostanci¹, T. Lacin²,
H.F. Batirel²

¹*Thoracic Surgery, Marmara University Research and Training Hospital, Istanbul, Turkey*

²*Thoracic Surgery, Marmara University Faculty of Medicine, Istanbul, Turkey*

Objectives:

We designed a novel practical wet lab model for VATS lung nodule palpation and evaluated the performances of the residents and attendings in our thoracic surgery program.

Methods:

Artificial lung nodules were formed by injecting sheep trachea/lung blocks with either cyanoacrylate or construction grade silicone diluted with synthetic thinner. Cyanoacrylate resulted in hard, fixed nodules with pleural discoloration if applied subpleurally. Silicone formed rubbery nodules that can blend into tissue and become unpalpable or rupture if roughly handled. Specimens were fitted inside a VATS training box, were intubated with a No:6,5 endotracheal tube and ventilated with an AMBU bag if requested by the trainee. Trainees manipulated the lung tissue with ring clamps. Time to find the first nodule, completion time, missed nodules were recorded. Trainees self declared completion when their exploration was finished.

Results:

4 residents and 3 attendings were evaluated. Specimens had 3-4 nodules of varying sizes, sites and materials. All attendings found all of the nodules in their specimens. Residents missed an average of 2 nodules per specimen due to missing/blending the peripheral silicone nodules, failing to palpate central nodules or palpating normal structures (bronchi etc) instead of the nodule. Average time to first nodule was 38 seconds for attendings, 57 seconds for residents and average declared completion time was 7,3 minutes for attendings, 7,7 minutes for residents. All participants were satisfied with the feel of the nodules and overall simulation ability of the model.

Conclusions:

This is a cheap and easy to do novel wet lab model for VATS lung nodule palpation. Our residents have exposure to and are gaining experience in major and minor VATS cases. This model serves as a very good primer for real surgical experience and we hope that it will facilitate learning process and ultimately decrease operating times of the residents.

Disclosure: No significant relationships.

P-219

COMPARISON OF VIDEO-ASSISTED THORACOSCOPIC THYMECTOMY AND OPEN THYMECTOMY TO TREAT MYASTHENIA GRAVIS: A META-ANALYSIS

Hu Liao, L. Liu

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

Objectives:

Video-assisted thoracoscopic thymectomy (VATT) is widely used to treat myasthenia gravis (MG), but it is still controversial. We performed a meta-analysis of studies that compared safety and efficacy of VATT and open thymectomy in order to determine which is a better choice. Video-assisted thoracoscopic thymectomy (VATT) is widely used to treat myasthenia gravis (MG), but it is still controversial. We performed a meta-analysis of studies that compared safety and efficacy of VATT and open thymectomy in order to determine which is a better choice.

Methods:

Fourteen studies were included in the meta-analysis. Two authors independently reviewed each study and extracted data on peri-operative mortality, overall morbidity, complete stable remission (CSR), occurrence of MG crises, operative time, intra-operative blood loss and postoperative hospital stay.

Results:

VATT was superior to open thymectomy in CSR (RR 1.30, 95% CI 1.06 to 1.59, $P=0.01$), overall morbidity (RR 0.62, 95% CI 0.41 to 0.95, $P=0.03$) and occurrence of MG crisis (RR 0.31, 95% CI 0.17 to 0.55, $P<0.001$ [ACR1]), but the two techniques did not differ significantly in mortality ($P=0.47$). Compared with open thymectomy group, operative time is significantly longer in VATT group (SMD 0.79, 95% CI 0.09 to 1.49, $P=0.03$) while intraoperative blood loss is less (SMD -2.07, 95% CI -2.36 to -1.77, $P<0.001$) and postoperative hospital stay is shorter (SMD -0.70, 95% CI -1.17 to -0.23, $P=0.004$;) There is no difference between the two groups of thymo-fatty tissue resected. However substantial heterogeneity was found in operative time ($X^2=108.50$, $I^2=93\%$), post-hospital stay ($X^2=13.39$, $I^2=78\%$) and intraoperative blood loss ($X^2=188.78$, $I^2=98\%$).

Conclusions:

These results suggest that VATT is associated with greater efficacy and safety than open thymectomy, making it potentially a better choice of surgical approach for myasthenia gravis patients.

Disclosure: No significant relationships.

P-220

A META-ANALYSIS OF DEBULKING SURGERY VERSUS SURGICAL BIOPSY FOR UNRESECTABLE THYMOMA

Masatsugu Hamaji¹, M. Omasa¹, F. Kojima¹, T. Sozu², T. Sato², F. Chen¹, M. Sonobe¹, H. Date¹

¹*Thoracic Surgery, Kyoto University, Kyoto, Japan*

²*Biostatistics, Kyoto University School of Public Health, Kyoto, Japan*

Objectives:

Observational studies on long-term outcomes following debulking surgery or surgical biopsy for unresectable thymoma showed various results. This meta-analysis was designed to determine the effect of debulking surgery against surgical biopsy on mortality rate in patients with unresectable thymoma.

Methods:

The Pubmed database was queried for studies published in the English language on unresectable thymoma and overall survival. We compared mortality rates following surgery between patients undergoing debulking surgery and patients undergoing surgical biopsy for unresectable thymoma. Meta-analysis was performed using the Mantel-Haenszel method and potential publication bias was evaluated with a funnel plot of precision.

Results:

No randomized trials on this topic were identified. Thirteen retrospective observational studies containing a sum of 314 patients with the number of deaths and person-year information were suitable for analysis. One hundred and seventy-two (54.8%) underwent debulking surgery and 142 (45.2%) underwent surgical biopsy. The pooled hazard ratio was 0.451 (95% confidence interval: 0.336-0.605, $p < 0.001$), favoring debulking surgery compared with surgical biopsy. The funnel plot of precision demonstrated no important publication bias.

Conclusions:

Our results suggested that debulking surgery for unresectable thymoma may be associated with improved mortality and be considered for patients with unresectable thymoma if possible.

Disclosure: No significant relationships.

P-221

RESULTS OF VIDEOTHORACOSCOPIC THYMECTOMY IN CHILDREN: ANALYSIS ON 40 PATIENTS

Berker Özkan¹, A. Demir¹, M. Kapdağlı¹, Z. Sungur Ulke², S. Duman¹, B. Cimenoglu¹, A. Toker¹

¹*Thoracic Surgery, Istanbul University, Istanbul School of Medicine, Istanbul, Turkey*

²*Anesthesiology, Istanbul University, Istanbul School of Medicine, Istanbul, Turkey*

Objectives:

The experience in videothoroscopic thymectomy is limited in pediatric patients with non-thymomatous myasthenia gravis. The aim of this study is to evaluate the medical status of the patients and surgical results.

Methods:

Out of 367 videothoroscopic thymectomy operations for myasthenia gravis, 40 patients were children. Prospective data recording was performed. Age, gender, duration of disease, body mass index (BMI), prescribed medication, length of the operation, complications, chest tube duration time, duration of postoperative hospital stay, and pain score (visual analogue scala (VAS)) were evaluated.

Results:

The average age was 14.8 \pm 2.2 (8-18) and 27 patients were female. Electromyography and acetylcholine receptor antibody positivity were 30 (75%) and 27 (67%) respectively. Mean quantitative myasthenia gravis score was recorded to be 11.5 \pm 5.3. The mean prescribed pre-operative pyridostigmine bromide dosage was 209 \pm 112 mg whereas, 11 (27.5%) patients were on corticosteroid treatment and 22 (55%) patients received intravenous immunoglobulin treatment preoperatively. There were no open conversions and mortality. Average duration of the operation was 48.9 (\pm 31.3) minutes. All were extubated on the table but only 1 (2.5%) patient required mechanic ventilation of 18 hours postoperatively. Three (7.5%) patients had complications. Average duration of drainage and postoperative stay were 20.5 (\pm 12.1) hours and 1.8 (\pm 1.0) days. Average pain score with visual analogue scala was 2.3 (\pm 1.2).

Conclusions:

The right sided videothoracoscopy is a safe procedure in pediatric patients with myasthenia gravis in centers experienced in myasthenia gravis.

Disclosure: No significant relationships.

P-222

CELLULAR STRUCTURE OF THE HYPERPLASTIC THYMUS WITH AND WITHOUT MYASTHENIA GRAVISJózsef Furák¹, T. Géczi¹, L. Tiszalvicz², B. Pécsy¹, Z. Rázga², L. Kuthy²¹*Department of Surgery, University of Szeged, Szeged, Hungary*²*Department of Pathology, University of Szeged, Szeged, Hungary***Objectives:**

In the pathogenesis of the myasthenia gravis (MG), T and B lymphocytes and the myoid cells of the thymus play important role, but there is few information about the cellular status of the hyperplastic thymus (HT) gland without MG. In this study the immune characters of these two different types of HT glands are compared.

Methods:

22 HT glands were removed from 10 males and 12 females (mean age 29.9 (18-52) years) due to 10 MGs and 12 suspected thymomas without MG. Immunohistological stainings on tissue microarray slides were performed of the 22 HT to detect CD4+ and CD8+T cells, FoxP3 regulatory T cells and B-lymphocytes (CD20), and the myoid cells (desmin). The stainings were evaluated by 2 independent pathologists on a 0-3 scale. Osserman stages of MG were as follows: 2 stage I, 6 stage IIA and 2 stage IIB. 25% of the patients with MG received immunosuppression or steroid.

Results:

There was no significant difference in the stainings of myoids cells between the HT glands with (mean 1.3) or without (mean 1.5) ($p=0.538$) MG. The occurrence of the CD4+ and CD8+ T cells and FoxP3 regulatory T cells, and the B cells in the thymus hyperplasia were not significant between the cases with or without MG: CD4 (2.2 vs. 2.9) ($p=0.064$), CD8 (1.9 vs. 2.4) ($p=0.132$), FoxP3 (2.7 vs. 2.1) ($p=0.120$) and CD20 (2.7 vs. 2.58) ($p=0.592$). In patients, who received immunosuppression or steroid therapy the CD4 value was significantly lower (1.7 vs. 2.8) ($p=0.037$).

Conclusions:

The hyperplastic thymus without MG contains the similar types and amount of T and B cells, and myoid cells as the hyperplastic thymus in MG. The pathogenesis of MG has not changed the investigated cellular structure of the thymus. The immunosuppression therapy has reduced the number of CD4+ T cells of the thymus in MG cases.

Disclosure: No significant relationships.

P-223

SUCCESSFUL RESECTION OF SUPERIOR VENA CAVA WITHOUT RECONSTRUCTION IN PATIENTS WITH TYPE III - IV OBSTRUCTION SYNDROME DUE TO MALIGNANT MEDIASTINAL TUMORS (ANALYSIS OF 4 CASES)

Oleg Pikin, V. Glushko, K. Kolbanov, A. Amiraliev, D. Vursol, V. Barmin, V. Bagrov
Thoracic Surgery, P.A. Herten Research Institute of Oncology, Moscow, Russian Federation

Objectives:

Surgical resection of mediastinal tumors in patients with superior vena cava involvement is challenging. In patients without superior vena cava obstruction its resection and primary reconstruction is usually performed. In cases of type III-IV vena cava obstruction revascularization or bypassing procedures are at high risk of thrombotic events.

Methods:

Four patients with mediastinal tumors and superior vena cava obstruction syndrome were operated on in our clinic. Histology of the tumor was: type B3 thymoma, thymic carcinoma, primary mediastinal germ-cell tumor and B-cell non-Hodgkin lymphoma. All patients received chemotherapy before surgery according to histological diagnosis. Duration of superior vena cava obstruction syndrome from the time of admission till the date of surgery was 2 to 4 months. In all patients the superior vena cava was completely obstructed by the tumor with compensated collateral blood flow which was confirmed by chest CT angiography. Surgery was performed via median sternotomy. Decision of superior vena cava resection without reconstruction was made after clamping of brahiocephalic and asygous veins for 20 minutes and the absence of brain edema symptoms. Superior vena cava was completely resected with the confluence of brahiocephalic veins and just above the right atrium in 2 and with preservation of asygous vein inflow – in 2 patients.

Results:

Postoperative period was uneventful in all patients. Two patients are free of disease 42 and 6 months after surgery. In one patient with type B3 thymoma pleural relapse in the right hemithorax was diagnosed 40 months after primary surgery successfully treated with pleurectomy followed by intrapleural hyperthermic chemotherapy. A patient with mediastinal germ-cell tumor died of multiple extrathoracic metastases 18 months after surgery.

Conclusions:

Resection of superior vena cava without reconstruction in patients with type III-IV obstruction syndrome due to mediastinal malignancy in cases of compensated collateral circulation is safe and technically feasible.

Disclosure: No significant relationships.

P-224

MEDIASTINAL BRONCHOGENIC CYST WITH ACUTE CARDIAC DYSFUNCTION: TWO STAGE SURGICAL APPROACHHassiba Smail¹, J.M. Baste², A. Canville³, P. Rinieri², J. Melki², C. Peillon²¹*Cardio Thoracic Surgery, Rouen, Rouen, France*²*Thoracic Surgery, Rouen Hospital, Rouen, France*³*Cardiology, Rouen Hospital, Rouen, France***Objectives:**

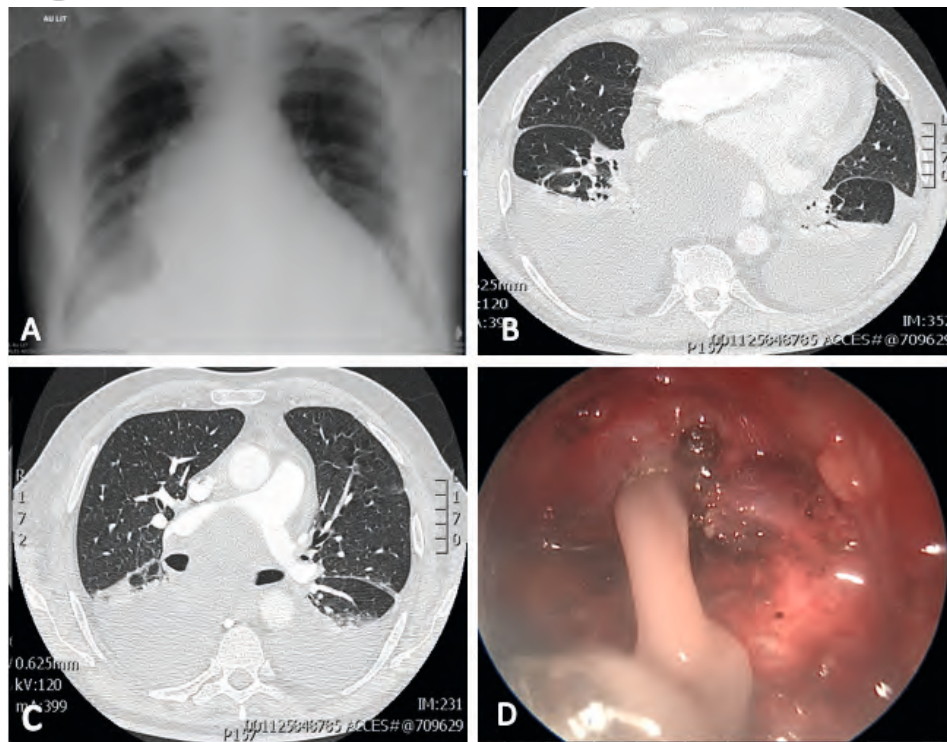
We describe a two stage surgical approach to rescue a patient presenting with cardiac dysfunction and hemodynamic compromise due to a massive and compressive mediastinal bronchogenic cyst.

Case description:

A 66-year-old man presented with acute onset of palpitations and severe dyspnea. On admission the electrocardiogram showed atrial fibrillation, the chest x-ray showed round density in the posterior mediastinum and pleural effusion (Fig 1A). A transthoracic echocardiography revealed pericardial tamponade. The patient underwent echocardiographic-guided drainage of his pericardial effusion, without improvement in the cardiac function. A chest computed tomography revealed a 10 cm, well-defined subcarinal cyst causing significant compression of the left atrium, left pulmonary artery and carina (Fig 1B,1C). This compressive cyst compromised the hemodynamic state which increased the risk of open surgery. Therefore to drain this mediastinal cyst, a video-assisted mediastinoscopy was performed in emergency through a cervical incision, and after dissection of the pre-tracheal plane, we aspirated 1.5 Liter of white yellow viscous fluid (Fig 1D) which improved immediately the cardiac function. We declined the excision of the cyst margins given to atrial fibrillation exacerbation. Five days later and under video thoracoscopy we tried to resect the cyst margins. There were found to be tightly adherent to the left atrium and the resection was impossible, we decided to convert to a right thoracotomy and performed the de-roofing of the superior aspect of the cyst to prevent recurrence. Histological examination revealed ciliated stratified epithelium characteristic of a bronchogenic cyst. The patient had uncomplicated postoperative recovery and was discharged 6 days later. After Six months , the patient remained asymptomatic and a CT scan showed no recurrence .

Conclusions:

Video-assisted cervical mediastinoscopy was particularly useful in the emergency management of this compressive bronchogenic cyst with hemodynamic compromise . To avoid recurrence, a second surgery was necessary to resect the cyst margins.



Disclosure: No significant relationships.

P-225

A RARE VASCULAR MALFORMATION; UNILATERAL ABSENCE OF PULMONARY ARTERY

S. Topçu¹, Serkan Özbay¹, A.G. Akgül¹, T. Liman¹, S. Gümüştas², S.S. Mehmetoğlu¹, H.F. Sezer¹

¹*Thoracic Surgery, Kocaeli University, Kocaeli, Turkey*

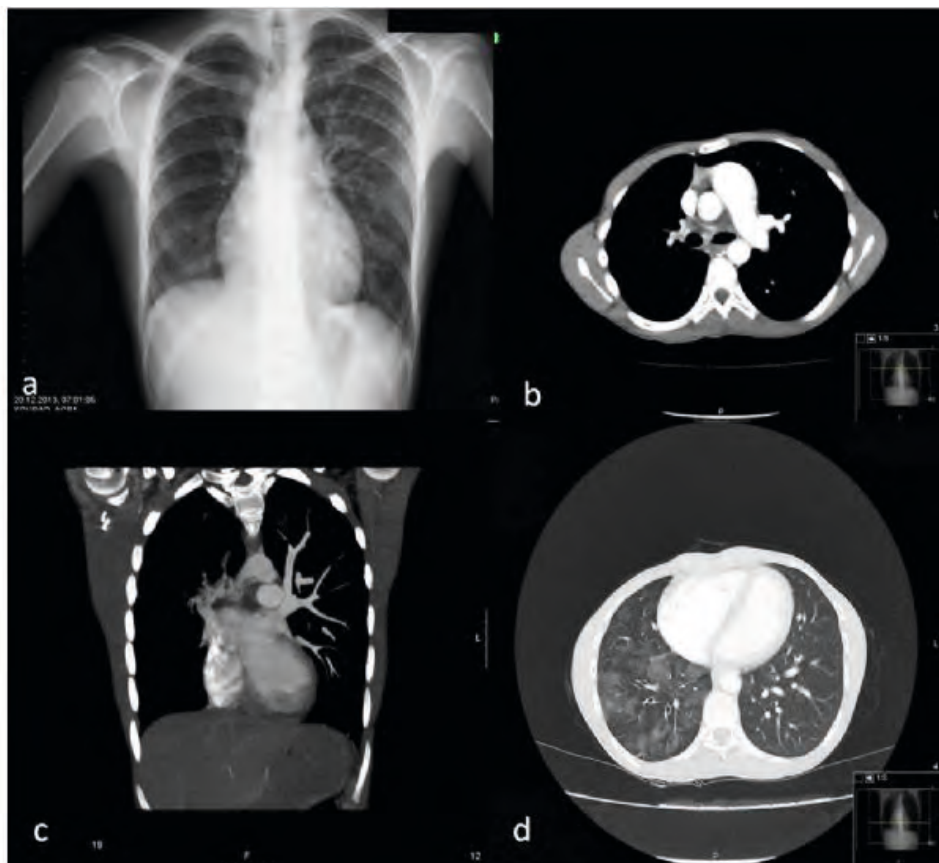
²*Radiology, Kocaeli University, Kocaeli, Turkey*

Objectives:

Unilateral absence of pulmonary artery (UAPA) is a rare malformation with approximately 1/200,000 prevalence. Most commonly, UAPA occurs in conjunction with cardiovascular abnormalities and nearly 40% of patients have isolated UAPA. We are presenting a case admitted to our clinic with hemoptysis and diagnosed a rare malformation UAPA.

Case description:

Radiological examinations of 19 year old male patient admitted to our clinic with hemoptysis showed small right hemithorax, ipsilateral less vascular marking, computed tomography scan showed diffuse ground-glass opacity, absence of right pulmonary artery, PDA between left pulmonary artery and aortic arch (Fig.1). The patient evaluated with echocardiography; PDA (broad), ASD (secundum), hypoplasia of the pulmonary artery branches, mitral valve prolapse mild tricuspid regurgitation and pulmonary HT (pulmonary artery pressure:115mmHg) were detected. A bronchial artery embolization performed to the right-sided bleeding bronchial arteries. The patient had no hemoptysis after the intervention and followed up with medical treatment.



Conclusions:

Diagnosis of UAPA is diagnosed definitively by computed tomography (CT), magnetic resonance imaging (MRI) or transthoracic echocardiography. Surgical treatment should be thought after cardiac catheterization and pulmonary venous wedge angiographic assesment. Severe infections may require surgical resections such as lobectomy or pneumonectomy. Hemoptysis may be treated with embolization or pulmonary surgery. Pulmonary hypertension is a severe complication. Treatment of those patients with pulmonary hypertension is medical therapy.

Disclosure: No significant relationships.

P-226

DOES BODY MASS INDEX IMPACT IN THE SURGICAL MANAGEMENT OR POSTOPERATIVE OUTCOME IN ROBOTIC THYMECTOMY?

Luca Luzzi¹, R. Borrelli², M. Ghisalberti¹, R. Corzani¹, L. Voltolini¹, P. Paladini¹, C. Ghiribelli¹, G. Gotti¹

¹Cardiothoracic Surgery, Thoracic Surgery Unit, Siena, Italy

²Thoracic Surgery, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Objectives:

This study evaluated the feasibility and safety of robot assisted thymectomy in obese patients reviewing our single centre experience.

Methods:

Between April 2012 and January 2014, 13 consecutive patients (5 male) underwent robotic thymectomy. 8 of these patients presented Miastenia Gravis in pre-operative. We reviewed age (range 18-81), BMI (range 20-40), time intervention, time of drainage, complications and post-operative hospital stay. Patients were divided in two groups according with the obesity grade (BMI>30, obesity grade I-II). Continuous variables were analyzed with the Mann-Whitney non parametric test for independent data.

Results:

Five patients had a BMI >30 (3 grade I and 2 grade II obesity, BMI>35). The mean operative time was 240 minutes (range 210-505). Mean time of drainage was 4 days (range 2-9) and mean postoperative stay was 5 days (range 3-10). No major complications occurred in our patients except for a left lung atelectasis. The monovariate analysis did not show significant differences in operative time (294 minutes for obese patients vs. 250 minutes p=1), drainage time (respectively 2,8 vs 4,75 days, p=0,284) and postoperative stay (respectively 3,8 vs 5,88 days, p=0,093). In the 2 patients with an obesity grade II, for the robotic camera, we used a special trocar for bariatric surgery placed at the 6th intercostal space instead than at the 5th.

Conclusions:

Obesity in mini-invasive surgery is considered a risk factor for post-operative complications and high risk of conversion to open procedure. Obesity in the robotic surgery of the mediastinum is not yet investigated. Our experience, despite initial, confirms no differences in surgical time or postoperative outcome considering some precaution in case of patients in obesity stage II. Despite we need to consider the difficulties related to an emergency open conversion, the robotic approach save the patient from a longer rehabilitation and a higher risk for sternal wound dehiscence.

Disclosure: No significant relationships.

P-227

LUNG TRANSPLANTATION FOR EMPHYSEMA: IMPACT OF AGE ON SHORT AND LONG-TERM SURVIVAL

Ilhan Inci¹, M. Schuurmans², J. Ehrsam¹, S. Hillinger¹, P. Kestenholz¹, W. Jungraithmayr¹, D. Schneiter¹, C. Benden², W. Weder¹

¹*Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland*

²*Respiratory Medicine, University Hospital Zurich, Zurich, Switzerland*

Objectives:

Emphysema is the most common indication for lung transplantation. The majority of patients present with chronic obstructive lung disease (COPD) and less frequently with alpha-1 antitrypsin deficiency (AAT). We analyzed the results of our lung transplantations for emphysema to identify the impact of age on short and long-term outcome.

Methods:

A retrospective analysis was undertaken of the 108 consecutive lung transplants for emphysema performed at our institution from November 1992 to August 2013 (77 COPD, 31 AAT). Retransplantations were excluded.

Results:

The median age was 56.6 years (range, 31-68). The 30-day mortality rate was 3.7%. One- and 5-year survival rates in COPD and AAT recipients were comparable ($p=0.87$, log rank test). The one- and 5-year survival rates for recipients aged < 60 years were significantly better than the age group of 60 years and older (91% and 79% versus 84% and 54%, $p=0.05$, log rank test). Since 2007 the one- and 5-year survival for these two age groups were at 96% and 92% versus 86% and 44%, respectively, $p=0.04$, log rank test). For following aspects no significant influence on survival rates were found: Use of extracorporeal membrane oxygenator during transplantation, waiting list time, sex, size reduction, body mass index, diagnosis COPD or AAT. Age at transplantation (≥ 60) was a risk factor in univariate analysis (HR 2.1; 95% confidence interval (CI) 1.09 – 4.09, $p=0.02$). In multivariate analysis (cox regression, backward stepwise) unilateral lung transplantation (HR 0.04; 95%CI 0.01 – 0.2), Zurich Recipient Comorbidity Score (ZRCs) 3 or more (HR 6.3; 95%CI 2.01–19.8), and Zurich Donor Score (ZDS) of 3 or more (HR 2.4; 95%CI 1.06–5.6) were independent risk factors for mortality.

Conclusions:

COPD and AAT recipients have similar overall long-term survival. Recipients aged >60 years and those with multiple co-morbidities as well as marginal donors with additional co-morbidities were important risk factors for mortality.

Disclosure: No significant relationships.

P-228

A CASE OF ACUTE FIBRINOUS AND ORGANIZING PNEUMONIA DURING EARLY POSTOPERATIVE PERIOD AFTER LUNG TRANSPLANTATION

I. Alici¹, E. Yekeler², Alkın Yazıcıoğlu¹, S. Turan³, Y. Tezer-Tekce⁴, F. Demirag⁵, N. Karaoglanoglu²

¹*Lung Transplantation, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

²*Thoracic Surgery and Lung Transplantation, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

³*Anesthesiology, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

⁴*Infectious Diseases, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara, Turkey*

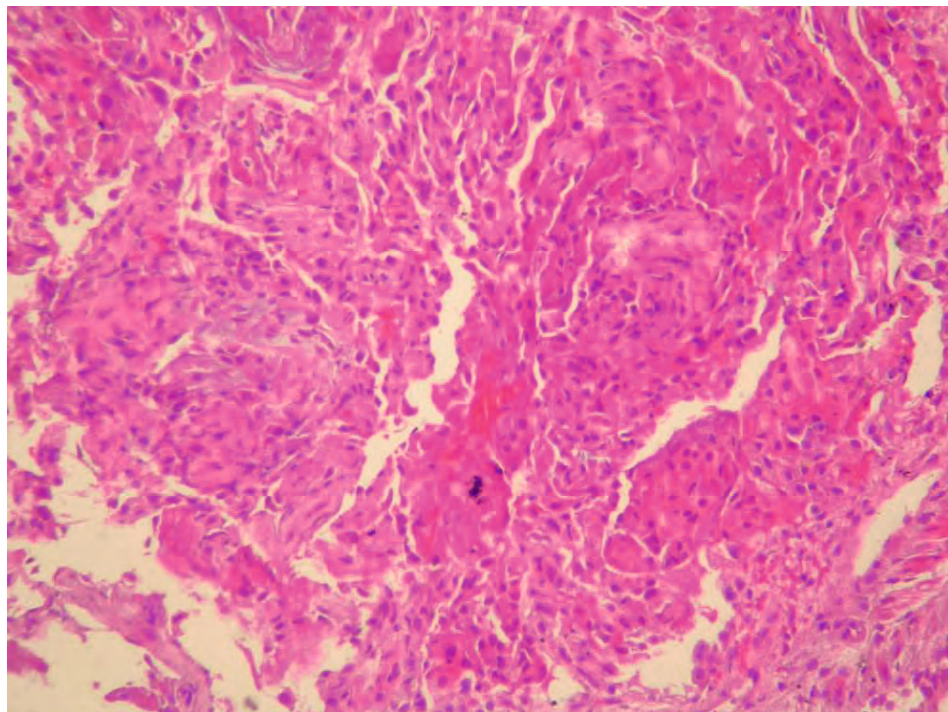
⁵*Pathology, Atatürk Chest Diseases and Thoracic Surgery Education and Research Hospital, Ankara, Turkey*

Objectives:

Acute fibrinous and organizing pneumonia (AFOP) is a distinct histological pattern often related to diffuse alveolar damage and organizing pneumonia. There is little information in lung transplantation patients.

Case description:

We present a 48 year-old-female who has experienced a life threatening AFOP during the second week after lung transplantation. The patient has undergone double lung transplantation for Pulmonary Langerhans Cell Histiocytosis and secondary pulmonary hypertension. The patient discharged to the ICU with peripheral ECMO. She received alemtuzumab induction followed by tacrolimus and prednisolone. A grade II primary graft dysfunction was cleared on the 5th day and the ECMO was weaned on the 7th day. The day after, a fever (>39°C) developed together with neutrophilia, high CRP and procalcitonin levels. An infiltration on the right lower zone was noticed. CT of the thorax revealed a consolidation on the right lower lobe. Anastomoses and bronchi were patent. We broadened the antibacterial spectrum and added systemic antifungal treatment for history of ECMO and vaginal candidiasis. Bronchoalveolar lavage fluid (BALF) revealed neutrophilia without remarkable microorganism. PCR for community-acquired respiratory viruses and mycobacteria and DFA for PCP were negative in BALF. Despite full coverage of anti-infective therapy, the infiltration grew, the fever remained, CRP and procalcitonin increased up to 388mg/L and 76.7ng/mL, respectively. Transbronchial lung biopsy revealed AFOP with diffuse alveolar damage, intraalveolar fibrin deposits, organizing pneumonia and lack of eosinophilia and hyaline membranes.



We started pulse corticosteroid therapy of 1gr/day of methylprednisolone for three days followed by 1mg/kg/day of prednisolone. The infiltration resolved, fever declined and other biomarkers decreased to normal levels within a week.

Conclusions:

Acute fibrinous and organizing pneumonia should be suspected when there is a pulmonary consolidation after lung transplantation even in very early posttransplantation period. The condition probably arised secondary to the graft dysfunction but other causes like drug reactions should be considered.

Disclosure: No significant relationships.

P-229

EARLY AND LATE RESULTS OF NUSS PROCEDURE IN SURGICAL TREATMENT OF PECTUS EXCAVATUM IN DIFFERENT AGE GROUPS

Krystian Pawlak¹, L. Gasiorowski², P. Zielinski¹, P. Gabryel¹, B. Galecki¹, W. Dyszkiewicz¹

¹Department of Thoracic Surgery, WCPIT, Poznan, Poland

²Thoracic Surgery, Poznan University of Medical Sciences, Poznan, Poland

Objectives:

The aim of the study was a comparison of early and late results of the surgical treatment of the funnel chest using the Nuss method in patients in various age groups.

Methods:

556 out of 718 patients operated from June 2002 to October 2012, were included to the retrospective analysis. Patients were divided into three different age groups: Group A - 156 patients from 7 to 14 years old, Group B - 328 patients aged 15 to 20 and Group C - 72 patients older than 25 years old.

Results:

Early and non life-threatening postoperative complications developed in 190 (34.8 %) of total number of cases and their frequency increased with patients' age (Group A 23,1 %, Group B 37,4 %, Group C 44,4 % - $p=0,00283$). This significant difference between age groups concerned especially pneumothorax ($p=0,00919$) and severe chest pain ($p=0,0012$). Good and very good corrective effect were achieved in 97,3 % of entire patients' population. Recurrence of the deformity was more often observed in the youngest patients (Group A - 3,2 %) than in other patients (Group B - 1,2 %, Group C - 1,3 %). Moreover, the most significant correlation with morbidity in early postoperative period was age above 25 years ($p=0,00002$), duration of the surgical procedure above 60 minutes and implantation of more than one corrected bar.

Conclusions:

Good cosmetic results obtained with the use of Nuss operation were not related to the age of patients. The high incidence of minor complications in older patients seems to be an acceptable cost of good cosmetic outcome and stable correction. In the youngest patients, the surgical morbidity is the lowest, but the frequency of the recurrence of deformation is higher than in other groups. Given above mentioned, the optimal time for the funnel chest correction is therefore still open.

Disclosure: No significant relationships.

P-230

OPTIMIZATION OF CHEST STABILIZATION METHODS FOR ACUTE RESPIRATORY DISTRESS-SYNDROME PROPHYLAXY AND TREATMENT IN PATIENTS WITH CRANIOTHORACIC TRAUMA

Volodymyr Pimakhov¹, O. Belov²

¹*Surgery №2, Dnepropetrovsk Medical Academy of Ministry of Health of Ukraine, Dnepropetrovsk, Ukraine*

²*Surgery №1, Dnepropetrovsk Medical Academy of Ministry of Health of Ukraine, Dnepropetrovsk, Ukraine*

Objectives:

To estimate different methods of rib fracture stabilization clinical effectiveness for acute respiratory distress-syndrome prophylaxis and treatment in patients with craniothoracic trauma

Methods:

We made retrospective analysis of treatment results in 46 patients, who were treated from 2011 till 2013 with combined thoracic and brain trauma, and have had rib fracture of 3 and 4 degree by Oxford classification. Severity of trauma varied between 10 till 34 points of ISS (median— $20,2 \pm 2,82$). Surgical chest stabilization was provided for 21 injured (main group): for 15 of them own extra-pleural technique (patent of Ukraine № 56389 from 10.01.11) was used, for 6 of them intramedullar osteosynthesis was provided. For other 25 patients (control group) internal stabilization by artificial lung ventilation was used. Groups were comparable by age, trauma and initial patient status severity, they were also comparable by fracture localization. We analyzed main spirometry results and severity of respiratory distress syndrome, for estimation Lung Injury Score (Murray,1998) was used.

Results:

4 patient of main group developed complication (mild air leakage, $n=3$, apparatus dislocation $n=1$). On the 5th day after trauma, breathing capacity was credibly more in main group $439 \pm 11,2$ ml. ($p<0.01$), (in control was $321,3 \pm 12,3$ ml.), and inspiration pressure was lower - $10,3 \pm 2,2$ mm.hg. ($p=0.01$) (in control group was $14,6 \pm 4,1$ mm.hg). In main group respiratory distress-syndrome was diagnosed more rare (9,5%) and showed more mild clinical course ($1,15 \pm 0,1$ points), than in control (36,0% and $2,1 \pm 0,25$ points) ($p<0.05$). Mortality in main group was 4,7% and in control one it was 10,5 %.

Conclusions:

Using of surgical stabilization methods for treatment of rib fracture in patients with craniothoracic trauma made possible not only to reduce the frequency of respiratory-distress syndrome, but decrease it severity.

Disclosure: No significant relationships.

P-231

**INTERCOSTAL ARTERY ANEURYSM AFTER THORACOTOMY.
A DIFFERENTIAL DIAGNOSIS PROBLEM**

Kostas Kostopanagiotou¹, K. Vachlas², K. Papagiannopoulos²

¹2nd Department of Cardiac Surgery, Onaseio, Athens, Greece

²Thoracic Surgery, St. James's University Hospital, Leeds, United Kingdom

Objectives:

An intercostal artery aneurysm is a rare vascular entity. These are sporadically reported and often relate to congenital aortic coarctation, repair of descending and thoraco-abdominal aneurysms, sternotomy, systemic diseases (neurofibromatosis, Kawasaki disease), penetrating injury and percutaneous chest procedures (pleurocentesis, pleural and lung biopsy). The standard thoracotomy has not been implicated yet. In this case report we describe our experience highlighting the dubious presenting symptoms.

Case description:

A 73 years-old male underwent sigmoidectomy for adenocarcinoma. He developed bilateral pulmonary metastases a year later. These were excised by VATS followed by two right thoracotomies in the 5th intercostal space. At one and three months the patient complained for severe post-thoracotomy pain of increasing intensity. This inverse nature of worsening pain by time without response to increasing analgesics is unusual. A chest x-ray showed a central spherical opacity in the right lung field. This alarming finding has a diverse diagnostic explanation. The possibilities include cancer recurrence, infection, hematoma or aneurysm. A contrast computed tomography showed a 2.2cm aneurysm of the 5th right intercostal artery (thoracotomy level). Treatment options discussed included observation only, surgical ligation and aneurysmatectomy or radiologic embolization. After discussion with the interventional radiologist it was successfully embolized using 3.5mls of thrombin under local anaesthetic. The patient remained 24 hours in hospital and a contrast CT was repeated prior to discharge. Follow-up at three and six months was normal.

Conclusions:

This extremely rare case of vascular pathology relates directly to surgery. The presenting features can easily confuse the inconspicuous physician and be attributed to thoracotomy pain. As such it may be mistreated as chronic pain. Spontaneous rupture can cause catastrophic hemothorax and shock. Conservative management should not be an option. The decision to re-open or embolization depends on the individual clinical setting and available means.

Disclosure: No significant relationships.



P-232

USE OF INTRAOPERATIVE ULTRASOUND PROBE TO DETECT VASCULAR INJURY BY BULLET DURING ENDOSCOPIC REMOVAL OF CHEST WALL BULLET

Kamran Ali, N. Agarwal, A.Z. Khan

Department of Minimally Invasive Thoracic Surgery, Medanta, The Medicity, Gurgaon, India

Objectives:

We present a case of use of intraoperative ultrasound to detect vascular injury during endoscopic removal of chest wall bullet

Case description:

A 30 year old male presented with gunshot injury to chest wall near the clavicle. Clinical examination and CT angiography did not show presence of neuro vascular injury by bullet. An endoscopic removal of bullet was performed. During surgery the bullet was felt to be impacted into the subclavian vein. Fluroscopic imaging could not detect this impaction. An intraoperative ultrasound was used to detect the exact position of the bullet in relation to the subclavian artery and vein. Proximal and distal control of the vessels was achieved prior to removal of the bullet. There was a tear of the subclavian vein due to impaction of the bullet. This was repaired using 4.0 prolene. No neurovascular compromise was observed postoperatively and patient was discharged 2 days later.

Conclusions:

Use of intraoperative ultrasound gives a dynamic representation of vascular structures and helps identify injury by bullet. This enables safe and controlled removal of bullet from the chest wall.

Disclosure: No significant relationships.

P-233

NOVEL APPROACHES TO COMPLEX CHEST WALL RECONSTRUCTION USING A COMBINATION OF TWO TITANIUM-BASED PLATING-SYSTEMS: A CASE REPORT

Eric Toloza¹, M. Splittgerber², W.W. Zhang², C.C. Moodie¹, J. Garrett¹, M. Hiro², D. Dayicioglu²

¹Thoracic Oncology, Moffitt Cancer Center, Tampa, United States of America

²Surgery, University of South Florida Morsani College of Medicine, Tampa, United States of America

Objectives:

Reconstruction of complex chest wall defects is a surgical challenge following large thoracic tumor resections. We report the first known case of combining two titanium plating systems which use different fixation methods (Synthes uses screws, and Stratos uses clips) to repair chest wall defects that were not reparable with either plating system alone.

Case description:

A 59-year-old woman, with prior left modified radical mastectomy for breast cancer, had subsequent recurrent breast cancer requiring radical left axillary and en-bloc resection of her left clavicle and left 1st-3rd ribs and reconstruction with titanium plates combined from the Stratos rib plating system and from Synthes rib, mandible, and fragmentation plating systems. She was discharged home on postoperative day (POD)#10, complicated only by left subclavian thrombo-occlusion. After 15 months, she developed chest wall breast cancer recurrence requiring resection of her mid sternum, underlying pericardium, and medial aspects of left 2nd-5th ribs, including the anteromedial ends of existing left 1st and 2nd titanium rib plates. The pericardial defect was patched with biologic mesh. The sternum was reconstructed with longitudinally-positioned Synthes titanium sternal plates. The left chest wall was reconstructed with a Synthes titanium rib plate connecting the right 4th rib to existing left 3rd rib Stratos titanium plate, using left 6th rib segment to bridge the new Synthes and old Stratos rib plates. Two halves of a Synthes titanium mandible plate reconstructed left 5th and 6th rib defects. The left chest wall soft tissue defect was reconstructed with biologic mesh and pedicled vertical rectus abdominus myocutaneous flap. She was discharged home on POD#5, without complications.

Conclusions:

We report a case where we combined two different types of plating-systems as well as novel techniques to reconstruct chest wall defects that were not amenable to reconstruction with either screw-fixation plating system versus clip-fixation plating system alone.

Disclosure: No significant relationships.

P-234

THE LONG TERM RESULTS OF DIFFERENT SURGICAL CORRECTION TECHNIQUES IN DIAPHRAGMATIC EVENTRATION

Çagatay Tezel, M. Vayvada, S. Kanbur Metin, S. Urek, S. Bayram, V. Baysungur, I. Yalcinkaya

Thoracic Surgery, Süreyyapasa Chest Disease and Thoracic Surgery Hospital, Istanbul, Turkey

Objectives:

Diaphragmatic eventration is defined by the long lasting or permanent elevation of the diaphragm without defects. There is no definite data about the benefit of different surgical technical corrections of the diaphragmatic location in adults. The aim of the study is to verify the benefit of different surgical correction techniques.

Methods:

Between January 2008 and November 2011, 26 consecutive adult patients with diaphragmatic elevation underwent thoracotomy were retrospectively analyzed. Correction of the diaphragm was achieved either accordion plication (n=10) or double-breasted plication (n=16) through thoracotomy. Operative outcomes with clinical (Medical Research Council-MRC Dyspnea score), radiological and functional improvement trend were compared between groups after 12 and 24 months.

Results:

The mean follow-up was 18.7 ± 5.2 months (range 12-32). Most of the patients (77%) were operated for the left sided diaphragmatic eventration. The mean MRC dyspnea score was 3.0. The mean elevation of the diaphragm was calculated as 5.7 ± 2.5 (3-11) cm. There was no statistically significant difference between both groups in age, gender, etiology, preoperative spirometric values, degree of diaphragmatic elevation and time to surgery. However, in the double-breasted plication group drainage was statistically increased. Although the corrected diaphragm was statistically well preserved in double-breasted plication group, this re-positioned diaphragm showed no effect on the value of spirometry and MRC score. No complication was noted specifically related to techniques.

Conclusions:

The results of the study show that radiological prospect of corrected diaphragm is well preserved with double-breasted plication, but respiratory function did not affected by the technique.

Disclosure: No significant relationships.

P-235

WHY DOES CATAMENIAL PNEUMOTHORAX (CPT) CAUSE FREQUENT POSTOPERATIVE RECURRENCE?Masatoshi Kurihara, H. Kataoka, T. Mizobuchi*Pneumothorax Research Center, Nissan Tamagawa Hospital, Tokyo, Japan***Objectives:**

Surgery for catamenial pneumothorax (thoracic endometriosis: TE) is a partial resection of diaphragm by VATS. But there is high postoperative recurrence rate between 30 and 70% in the previous reports. The aim of this study is to clarify the cause of high postoperative recurrence.

Methods:

66 female patients with CPT underwent VATS. We tried a clinical classification of thoracoscopic and microscopic diagnosis for TE. '0' is expressed no endometriosis, '1' is suspicious and '2' is confirmed. Diaphragm is expressed D, lung is L and thoracic parietal pleura is W each for thoracoscopic diagnosis. They are expressed d, l and w each for microscopic diagnosis. We studied a developmental staging of TE inside thoracic cavity. The a, b or c mean staging of microscopic diagnosis. The A, B or C mean staging of thoracoscopic diagnosis. Stage 0 is no endometriosis anywhere. Stage a or A are endometriosis just in diaphragm. Stage b or B are endometriosis just in two parts of diaphragm or lung or thoracic parietal pleura. Stage c or C are endometriosis in diaphragm and lung and thoracic parietal pleura.

Results:

In VATS, Stage A: 18cases (26%), stage B: 33cases (52%), stage C: 13cases (20%) each. In microscopic examination, Stage 0: 2cases (3%), Stage a: 27cases (44%), stage b: 26 cases (42%) and stage c: 7cases (11%) each. Gland tissue of endometriosis in diaphragm is 21cases (33%) and stromal tissue of endometriosis in diaphragm is 58cases (91%). Most of TE besides diaphragm is at back side of thoracic parietal pleura and at the margin of middle lobe (S4) or lower lobe (S6).

Conclusions:

72% (46cases) of TE is in stage B or C at surgery. Dissemination to intra-thoracic cavity is already visible at surgery. That is the cause of high postoperative recurrence. Stromal tissue is important for microscopic diagnosis on TE.

Disclosure: No significant relationships.



P-236

SUCCESSFUL TREATMENT OF 13 YEARS CHRONIC POST PNEUMONECTOMY EMPYEMA WITH BRONCHOPLEURAL FISTULA IN A PATIENT WITH CLAGETT-WINDOW

Arthur Kostron, D. Schneiter, I. Opitz, W. Weder

Division of Thoracic Surgery, University Hospital Zurich, Zurich, Switzerland

Objectives:

To emphasize the success of our accelerated treatment of post-pneumonectomy empyema.

Case description:

A 67 year old male presented to our outpatient clinic for a second opinion. In 1998 a central squamous cell carcinoma of the right upper lobe was diagnosed and right sided pneumonectomy was performed. A post-pneumonectomy empyema (PPE) developed two months postoperatively and after an unsuccessful thoroscopic debridement a Clagett-window was installed 5 months after pneumonectomy. With persistent bronchopleural fistula (BPF) and chronic PPE the patient suffered from multiple left-sided pneumonias with regular need for hospitalization and intravenous antibiotic treatment. Quality of life was significantly reduced through chronic infection with persistent irritating and productive cough as well as weight loss, exercise induced dyspnea and weakness. We decided to perform our accelerated empyema treatment concept. Re-Thoracotomy with radical surgical debridement and installation of a vacuum system was performed. In total the patient underwent three interventions with a time interval of 3 days between repeated debridement. After the 3rd intervention no macroscopic signs of infection persisted and granulation of the thoracic cavity had progressed. Before definitive closure of the chest, a pedicled right latissimus dorsi flap was placed into the cavity to close the defect of the bronchial stump and to obliterate the chest cavity. The chest cavity was filled with antibiotics. To date the patient is at home without any sign of relapse. Physical strength and weakness improved substantially.

Conclusions:

This case illustrates our successful accelerated treatment concept for post-pneumonectomy empyema with cure of the bronchopleural fistula and definitive closure of the chest; even in late onset chronic empyema.

Disclosure: No significant relationships.

P-237

TALC PLEURODESIS FOR MALIGNANT PLEURAL EFFUSION - EFFICACY AND FACTORS PREDICTING RECURRENCEFederico Tacconi¹, T. Géczi², A. Protopapas¹, P. Froeschle¹¹*Thoracic Surgery, Royal Devon & Exeter Foundation Trust, Exeter, United Kingdom*²*Department of Surgery, University of Szeged, Szeged, Hungary***Objectives:**

To identify potential factors predicting recurrence after talc pleurodesis for malignant pleural effusion.

Methods:

Retrospective study of two cohorts of consecutive patients undergoing surgery for malignant pleural effusion (T VATS/ talc pleurodesis number of procedures N=41, IPC VATS/ Indwelling Pleural catheter catheter N=41). Data analysed: ASA, Performance Status, underlying histology, amount of effusion drained at initial procedure, morbidity, recurrence of effusion (RecEff), redo surgery due to recurrence. The definition of RecEff was based on imaging (at least CxR) and related report issued by a senior Radiologists. Median radiological follow up of both groups was identical (8 months). Statistical analysis was done through SPSS vers 21.

Results:

The RecEff rate was 20% in the IPC group and 32% in the T group. Fifty percent (4/8) of patients with failed pleurodesis in the IPC group required redo surgery compared to 92% (12/13) in the T group, which was significant. Median time to recurrence in the IPC group was 9 months, in the T group 4 months. In the T group the only relevant factor associated with recurrence was lung cancer histology ($p=0.055$). The statistical significance of ASA Score > 2 ($p=0.042$) and Performance Status 2 ($p=0.019$) in this context is difficult to interpret. There were no significant differences between cohorts in Age (69.5 years [60-78.2]), Gender (41 males and 41 females), ASA (3 [2-3]), Performance Status (1 [1-2]), Milliliters of effusion drained (1600 [1000-2550]), site of primary (Mesothelioma 32% of patients, Lung Ca 21%) and morbidity (7%).

Conclusions:

The recurrence rate after talc pleurodesis was notably higher compared to the IPC group in our study and a significant number of patients affected required redo surgery. Lung cancer histology was the only clinically relevant predictor of recurrence in the talc group, potentially favoring the choice of a primary IPC insertion for these patients rather than chemical pleurodesis.

Disclosure: No significant relationships.

P-238

TREATMENT OF PRIMARY SPONTANEOUS PNEUMOTHORAX WITH THIN CATHETER DRAINAGE ASSOCIATED WITH HEIMLICH VALVE. COMPARATIVE ANALYSIS

N. Paleari¹, Juan Braga Menendez¹, J. Ansele¹, L. Pankl², B. Morris¹, D. Chimondeguy¹

¹*Thoracic Surgery, Hospital University Austral, Derqui, Argentina*

²*Thoracic Surgery, British Hospital, Capital Federal, Argentina*

Objectives:

Spontaneous pneumothorax is divided into primary and secondary, distinguish itself from traumatic and iatrogenic. Current treatments include: observation, needle aspiration, pleural drainage and surgery. The Heimlich valve is a portable device designed for the way outpatient management of primary spontaneous pneumothorax. We present our experience using a thin catheter pleural drainage associated with Heimlich valve (VH) for the treatment of primary spontaneous pneumothorax compared with a group of patients treated with conventional chest tube drainage (CCTD).

Methods:

analytical and descriptive, retrospective study, including 126 patients treated for primary spontaneous pneumothorax (PSP). Between January 2000 and December 2013, 83 patients were treated with 8 french pleural drainage set with Heimlich valve (HV) and 43 with conventional 20-28 french chest tube (CCTD) connected to water seal between January 2008 and December 2013. Demographic variables, size and episode of pneumothorax, side affected, surgical time, evacuation and complication rate were similar, without significant statistical difference according to the method used. Patients with secondary, traumatic, iatrogenic, hypertensive and laminar pneumothorax were excluded.

Results:

in HV group, 72 patients (86.7%) were managed as outpatients and 11 cases (13.2 %) required hospitalization with an average of 1.3 days. In the CCTD group, the mean hospital stay was 2.6 days (p0,001). Only 22 patients (26.5 %) of HV group required intravenous analgesia while in the CCTD group 37 patients (86 %) required it (p 0,002). The cost in HV group was USD 599 in outpatient and USD 1854 in which required hospitalization. In CCTD group all the patients needed hospitalization and the cost was USD 3000

Conclusions:

The use of HV was satisfactory and safe for the treatment of SPS and may have benefits for patient comfort and mobility avoiding hospitalization, lower economic cost compared with conventional pleural drainage.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**08:30 - 15:15****NURSE SYMPOSIUM-ORAL****N-239****HOW TO PREVENT THAT PATIENTS UNDERGOING SURGERY IN THE LATERAL POSITION DEVELOP PRESSURE ULCERS**Elisabeth Holbaek, C. Walsøe*Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark***Objectives:**

Pressure ulcers (PU) are a severe complication following an operation. It's a setback for the patient regarding pain, inconvenience and prolonged hospital stay. As part of the Capital Region's goal "no pressure ulcers in 2014", the Operating Department initiated a project researching into the incidence of PU, the development of PU and how to prevent the development of PU in the operating theatre.

Methods:

A review comprised of A) a systematic literature search B) a critical evaluation of the included academic articles and analysis of content relevance. A search of literature was conducted in the databases CINAHL and PubMed.

Results:

Patients undergoing surgery risk developing PU due to intrinsic and extrinsic factors. The intrinsic factors are factors, which can be considered but not necessarily corrected. The extrinsic factors as the type of mattress, positioning equipment, the patients' temperature during surgery, shearing, friction and moisture are all factors, which can increase the risk of developing PU. These are also factors which can be minimized if taken into consideration when planning the care of the patient.

Conclusions:

Actions and interventions preventing the patients developing PU due to the extrinsic factors are now incorporated into the overall nursing standards. Plans of actions such as procedures of transfer of the patient, positioning the patient and overseeing the patients' temperature perioperative have been introduced and implemented in the nursing practice. Cooperation between the wards, the OR and the ICU has been established in order to plan the prevention of PU, when the patient is transferred from one department to another.

Disclosure: No significant relationships.

N-240

WHAT DOES THE PATIENT UNDERGOING AN OPERATION FOR CANCER IN THE LUNG NEED WHEN RECEIVED AT THE OR?Tina Maria Ostrowska*Cardiothoracic Surgery, Rigshospitalet, Copenhagen, Denmark***Objectives:**

Studies show that patients waiting for an operation are anxious and stressed. Anxiety and stress enhances the patients' risk of postoperative complications and may extend the hospital stay and cause the patients' unnecessary discomfort. Multidisciplinary interventions may reduce the patients' anxiety and stress. Knowledge of the patients' needs and experiences are lacking. A study was initiated to gain knowledge of the patients' experiences and needs when undergoing surgery for cancer of the lung.

Methods:

A study with a qualitative approach and the use of a semistructured interview guide. Six patients were included, and interviewed. The interviews were transcribed word for word and analysed using the Steinar Kvale method. The analysis comprised condensation, coding and interpreting the interview.

Results:

Twelve subthemes appeared analysing the interviews. The patients were generally satisfied with how they were received at the OR. The patients especially experienced good teamwork and a good atmosphere between the team members. The atmosphere and the relation were two important factors in making the patients feel secure. This corresponds with the findings in the literature, which concludes that respect among the team members enhance the teamwork and the good atmosphere around the patient. Other studies show that relationship between the patient and the nurse is based upon a social relation more than a physical and emotional relation.

Conclusions:

Making the patient feel secure, confident and establishing a relation to the team in the OR are essential factors in fulfilling the needs of the patients undergoing surgery. Therefore teamwork in the OR must become a priority and warrants further investigation.

Disclosure: No significant relationships.

N-241

THE ENHANCED ADMINISTRATION OF PERIOPERATIVE ORAL HEALTH MIGHT REDUCE POSTOPERATIVE SYSTEMIC INFLAMMATION AND PNEUMONIA IN MINIMALLY INVASIVE ESOPHAGECTOMY: A COMPARATIVE STUDY

H. Wang¹, Min Hu², Y. Ou², L. Tan¹

¹*Thoracic Surgery, Zhongshan Hospital, Fudan University, Shanghai, China*

²*Department of Nursing, Zhongshan Hospital, Fudan University, Shanghai, China*

Objectives:

Recent advances had suggested that oral health health be related with postoperative inflammation. We herein attempted a protocol of enhanced administration of perioperative oral health for the patients who underwent minimally invasive esophagectomy (MIE). The protocol involved implementation of teeth brushing TID and chlorhexidine gluconate (0.12%, 20ml) oral rinse BID from hospital admission until discharge after surgery which was assisted and supervised by ward nurses. The aim of this study was to examine the efficacy of this enhanced administration with comparison to conventional care (only preoperative teeth brushing based on the patient's habit without supervision).

Methods:

A total of 220 consecutive esophageal cancer patients between May 2012 and October 2013 were included. All patients underwent thoracoscopic MIE with the placement of nasogastric tube drainage for about 7 days. The initial 110 patients implemented conventional care (Group CC), and the later 110 implemented enhanced administration of perioperative oral health (Group EA). Patient' 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. Post-operatively, the increased WBC count was much less in Group EA than Group CC on POD1 ($(5.72 \pm 2.24) \times 10^9$ vs. $(6.38 \pm 2.13) \times 10^9$, $p=0.025$), on POD4 ($(5.64 \pm 2.31) \times 10^9$ vs. $(6.51 \pm 2.09) \times 10^9$, $p=0.004$) and on POD7 ($(4.27 \pm 1.76) \times 10^9$ vs. $(4.85 \pm 1.69) \times 10^9$, $p=0.013$). The days amount of abnormally increased temperature ($>38.0^\circ\text{C}$) was less in Group EA than Group CC ($(2.9 \pm 1.4)\text{d}$ vs. $(3.4 \pm 1.6)\text{d}$, $p=0.037$). Besides, the occurrence of pneumonia was less in group EA than in Group CC (5.8% vs. 10.9%, $p=0.140$).

Conclusions:

The enhanced administration of perioperative oral health seems to be beneficial to reduce post-operative systemic inflammation and pneumonia in MIE. However, further randomized controlled trials are required to confirm these findings.

Disclosure: No significant relationships.

N-242

POSTOPERATIVE REHABILITATION IN OPERATION FOR LUNG CANCER. A RANDOMISED CLINICAL TRIAL WITH BLINDED EFFECT EVALUATION: RATIONALE AND DESIGN (PROLUCA)

Maja Schick Sommer¹, K. Trier¹, M. Missel², K.R. Larsen³, J. Vibe-Petersen¹, J.H. Pedersen², H. Langberg⁴

¹Research Centre, Copenhagen Centre for Cancer and Health, Copenhagen, Denmark

²Department of Thoracic Surgery, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark

³Pulmonary Department, Bispebjerg Hospital, University of Copenhagen, Copenhagen, Denmark

⁴University of Copenhagen, Department of Public Health, Copenhagen, Denmark

Objectives:

The purpose is, in a non-hospital setting, to investigate the efficacy of early postoperative rehabilitation in patients with operable lung cancer - with focus on exercise.

Methods:

We are conducting a trial of a continuous response variable (VO_{2peak}) from independent experimental and control participants (1:1). One hundred and eighty participants (90 in each group) with histological evidence of non-small cell lung cancer (NSCLC) at disease stage I-IIIa, referred for surgical resection at Department of Cardiothoracic surgery RT, Rigshospitalet, will be randomly assigned to postoperative rehabilitation initiated either (1) two weeks after surgery or (2) fourteen weeks after surgery. The postoperative rehabilitation program consists of a supervised group exercise program comprising resistance and cardiovascular training two hours weekly for 12 weeks (exercise intensity at 60-90% of VO_{2peak} and 60-80 % of one-repetition-maximum) combined with individual counseling. The primary study endpoint is VO_{2peak} (direct measurement). Secondary endpoints include: Perioperative complications (registered prospectively up to 30 days after surgery), 6 MWT, 1 RM, patient-reported outcomes (e.g., quality of life, fatigue, depression, lifestyle), hospitalization time, sick leave, work status, and survival. All endpoints will be assessed at 5 predetermined appointments; (1) baseline (the day before surgery), (2) 2 weeks (only 6MWD), (3) 14 weeks, (4) 26 weeks and (5) 52 weeks postoperatively.

Results:

A feasibility study (n=48) indicate that the PROLUCA postoperative rehabilitation program for patients with NSCLC is safe and feasible and the plan is to present preliminary results from the feasibility at the ESTS conference in June 2014. The results of PROLUCA will identify the optimal postoperative rehabilitation for NSCLC patients with focus on exercise initiated as early as 14 days post surgery.

Conclusions:

This study will contribute to establish rehabilitation guidelines for operable NSCLC patients.

Disclosure: No significant relationships.

N-243

EXERCISE INTERVENTION FOR PATIENTS WITH OPERABLE LUNG CANCER: A QUALITATIVE LONGITUDINAL FEASIBILITY STUDY

Malene Missel¹, J.H. Pedersen¹, C. Hendriksen², M. Tewes³, L. Adamsen²

¹*Department of Thoracic Surgery, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark*

²*Faculty of Health And Medical Sciences, Copenhagen University, Copenhagen, Denmark*

³*The Heart Centre, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark*

Objectives:

To explore operable lung cancer patients' experiences of participation and the feasibility of an intervention comprising exercise two times per week in a longitudinal perspective.

Methods:

Lung cancer patients referred for surgery at the department of thoracic surgery were recruited for the exercise intervention. The first twenty patients enrolled in the intervention took part in qualitative interviews at three time points: the day after surgery, seven weeks and four months after surgery. The analysis was conducted based on Ricoeur's theory of interpretation using a phenomenological hermeneutical approach. Themes that emerged that identified patients' experiences of participation in the exercise intervention and the change over time will be presented.

Results:

Analysis are not performed yet but is expected to be completed ultimo May 2014. The following will be presented: Demographic data and physical activity level prior to intervention, data on comorbidity, surgical procedure, type of surgery, adjuvant chemotherapy, medical characteristics, dropouts of the intervention and reasons for dropping out, attendance rate, unexpected reactions/adverse events and themes from the analysis

Conclusions:

While the study used a qualitative design and by its nature the results are not generalisable, it will provide evidence of the patient perspective of participation in an exercise intervention. Thus the study does not prove the effect of the intervention but highlights the patients' perceived advantages and barriers of participating. The findings of this study should be used in qualifying the exercise intervention and might inspire clinicians and multidisciplinary teams to develop interventions, which are clinically based on operable lung cancer patients' specific needs.

Disclosure: No significant relationships.

N-244

NURSES' KNOWLEDGE LEVEL ABOUT MANAGING CHEST TUBE-DRAINAGE SYSTEM

Gamze Çetinkaya, S. Sümer, H. Melek, S. Çolakoğlu, M.M. Erol, A.S. Bayram, C. Gebitekin
Thoracic Surgery, Uludag University, Faculty of Medicine, Bursa, Turkey

Objectives:

A nurse is responsible for managing a chest tube and drainage system after insertion either in theatre or in the ward. The aim of the study was to evaluate the nurses' knowledge level about managing a chest tube-drainage system and to define the in-service training needs.

Methods:

The data were collected using survey method. The questionnaire was performed with 150 nurses by face-to-face interviews. In total, 18 questions (some with pictures) were asked to evaluate nurses' knowledge in the thoracic as well as the other related wards such as cardiac, general surgery, ICU, PICU etc. The questions were related to thorax drain bottle preparation, carriage, drainage level follow-up and urgent interventions. Every question was scored as 10 and a total of 100 points (knowledge score) was the highest score. A score 60 or lower was poor, 70-80 moderate, and 90-100 were defined as high level of knowledge. Statistical analysis was performed using SPSS 17.

Results:

All but 13(8.7%) nurses were female with a mean age of 31.4 (22-50) years. The mean knowledge score of the all nurses was 76 (40-100) points. The mean score of the nurses working in the Thoracic and cardiac surgery departments (TCSD) was 93.1 and 70.8 working in the other units. It was determined that nurses working in the TCSD were more successful. One third of the nurses that had never worked in TCSD and followed up 10 or more patients had poor level of knowledge (31.6%). There were no major differences between education, experience, age and knowledge level.

Conclusions:

The knowledge level of nurses working in other clinics (although they follow up many patients with chest tube) about managing a chest tube-drainage system is inadequate. In addition, this study reveals the importance of in-service training, particularly new devices and equipment, for nurses working in non-thoracic units.

Disclosure: No significant relationships.

N-245

THE DIAGNOSIS AS THE FIRST CRITICAL MOMENT IN THE DAILY LIFE AND TREATMENT TRAJECTORY FOR OPERABLE LUNG CANCER PATIENTS – AN EXPLORATION OF THE PATIENTS’ LIVED EXPERIENCESMalene Missel¹, J.H. Pedersen¹, C. Hendriksen², M. Tewes³, L. Adamsen²¹*Department of Thoracic Surgery, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark*²*Faculty of Health And Medical Sciences, Copenhagen University, Copenhagen, Denmark*³*The Heart Centre, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark***Objectives:**

There has been a significant improvement in the surgical treatment of lung cancer while the patients’ experiences of diagnosis and treatment trajectory related to their daily life are sparsely investigated. The objective are therefore to explore patients’ experiences of being diagnosed with operable lung cancer and how the diagnosis interferes with the daily life in order to explore operable lung cancer patients potential needs of early initiated care interventions.

Methods:

A longitudinal design where interviews are performed at four time points ‘four critical moments’ within the first four month following diagnosis and surgery has been chosen. The four critical moments are: 1) the diagnosis, 2) surgery and hospitalization, 3) the period after discharge, 4) the return to daily life. In present abstract results from the first critical moment ‘the diagnosis’ is presented. Data were collected 7-10 days following the lung cancer diagnosis. Nineteen patients are included and analysis is based on Paul Ricoeur’s theory of interpretation. The contextual framework of the study is phenomenological and was carried out in the field of supportive care in cancer. The theoretical framework is inspired by Alfred Schutz’s phenomenological sociology.

Results:

The results are presented as themes emerged from the analysis and are an expression of how the diagnosis interferes and disrupt the patients’ daily life; the cancer diagnosis is a chock, the cancer diagnosis affects the patients’ existence, the cancer diagnosis affects the patients emotionally, the cancer diagnosis disrupts the social relations.

Conclusions:

The diagnosis is considered as the first critical moment and interrupts the patients’ daily life. The patients have a need for psychosocial support and information in the period between diagnosis and surgery, and the interaction between the patient and health care professional are important.

Disclosure: No significant relationships.

N-246

CHANGES IN SYMPTOM OCCURRENCE FROM BEFORE TO FIVE MONTHS AFTER LUNG CANCER SURGERY

Trine Oksholm¹, C. Miaskowski², J. Kongerud¹, S. Paul², B. Coope², S. Solberg³, T. Rustoen⁴

¹*Department of Respiratory Medicine, Oslo University Hospital, Oslo, Norway*

²*School of Nursing, University of California,, San Francisco, United States of America*

³*Department of Cardiothoracic Surgery, Oslo University Hospital, Oslo, Norway*

⁴*Division of Emergencies and Critical Care, Oslo University Hospital, Oslo, Norway*

Objectives:

Symptoms are important postoperative outcomes. Patients operated for lung cancer need information about the usual course of recovery. The purpose of this study was to evaluate for changes in symptom occurrence prior to and following surgery.

Methods:

Patients were recruited from three university hospitals. They completed questionnaires prior to and 1 and 5 months after surgery. Medical records were reviewed. The Memorial Symptom Assessment Scale (MSAS) was used to evaluate 32 symptoms. Symptom occurrence were analyzed for the six most common physical symptoms (i.e., pain, lack of energy, feeling drowsy, difficulty sleeping, shortness of breath (SOB), cough) and the most frequent psychological symptom (i.e., worrying) reported after 5 months. Changes in symptom occurrence were evaluated using multilevel growth models.

Results:

The 212 patients who provided data at five months had a mean age of 66.1 (SD=8.3) years, 57.1% were men. After five months, 36% of the patients were using analgesics, compared to 15% at the preoperatively and 75% at 1 month. Total number of symptoms increased significantly from preoperative (Mean=9.1 SD=7.0) to 1 month (Mean=12.8, SD=6.7, $p < 0.001$) assessment. At 5 months, the number of symptoms was lower than at 1 month but significantly higher (Mean=11.0, SD=6.9, $p < 0.001$) than preoperatively. The trajectories for the occurrence of the seven symptoms were variable. SOB increased at 1 month and remained high at 5 months. Pain, lack of energy, and feeling drowsy increased significantly one month after surgery then decreased at month 5. Occurrence for cough, difficulty sleeping and worrying did not change over 5 months.

Conclusions:

These findings suggest that patients who undergo lung cancer experience a high number of symptoms 5 months after surgery. Clinicians need to ask for symptoms and develop effective interventions to improve symptom management for these patients.

Disclosure: No significant relationships.

N-247

THORACIC SURGERY NURSE LED CLINIC SERVICE. THE LEEDS EXPERIENCE

Sithatshisine Dlamini, P. Tcherveniakov, R. Milton, K. Papagiannopoulos
Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom

Objectives:

A nurse led clinic initiative was established in 2007 in response to the demands of a growing thoracic service. Aims included cost reduction, release outpatient clinic capacity, reduction of in hospital stay and fast access to the thoracic service for surgical patients who developed or had complications following surgery.

Methods:

Experienced senior ward staff leads the clinic, once weekly. It is located in the thoracic ward utilising both treatment rooms. Thirty-minute slots allow 16-20 patients to be served each week. Patients attend for chronic Chest drain and wound management, blood tests and urgent imaging studies. Access to medical review and direct admission to the ward is available if deemed necessary. All consultations are documented in patients notes and attendance recorded on Patient Admin System, generating income for the Department

Results:

635 attendances were recorded within 12 months. An audit conducted amongst patients revealed that the service was rated as excellent, very good and good at 31%, 56% and 10% respectively. Patients found the service convenient, familiar and easy to use as they were attended by staff already known to them.

Conclusions:

The advent of the nurse led clinic has provided an effective and efficient way to review surgical patients. Patient experience included fast and efficient consultation, with privacy within a friendly environment and an appropriately kitted treatment room. Activity was recorded for legal, auditing purposes allowing increased activity within the same capacity and generation of significant income for the Department. None of these patients experienced the long waiting times at emergency departments having an appropriate plan of action drawn with no delays and decisions made on the spot.

Disclosure: No significant relationships.



N-248

**EXCHANGES OF EXPERIENCES FROM PATIENT TO PATIENT:
A STUDY IN LUNG CANCER OPERATED PATIENTS**

Britt Borregaard, L. Bjerregaard, S. Petersen, I. Aagaard, E. Jakobsen

Department of Cardiothoracic and Vascular Surgery, Odense University Hospital, Odense, Denmark

Objectives:

In present years focus has been targeted on patient involvement in the health care system and applying patient experiences in improving quality of the patient journey. Studies have shown that patients use experiences of fellow patients in regard to well-being, surgery and recovery. Former patients know the pathway, thoughts, emotions and needs connected to the disease. They have a different understanding of various aspects of living with and recovery from a disease than the health professionals. Experiencing that former patients have recovered from same disease is expected to improve patient healing, recovery and comfort.

Methods:

The aim of this study is to establish patient-to-patient interaction among presently hospitalized and formerly lung cancer operated patients. The project will be evaluated by a qualitative interview study of patients who exchanged experiences with former lung cancer operated patients. The interviews will be analysed thematically to derive findings on the effect of the patient-to-patient contact on the whole disease, recovery and the quality of life of presently hospitalized patients.

Results:

The project will start in the spring of 2014 and interviews will be performed continuously during the project period. Evaluation of the effect of the patient-to-patient contact will be presented on the poster.

Conclusions:

If positive effect of the contact between former and presently hospitalized patients are observed, the set-up will be elaborated to all patient groups in the department including patients who have undergone vascular, heart and lung surgery.

Disclosure: No significant relationships.

MONDAY, 16 JUNE 2014**17:00 - 18:05****NURSE SYMPOSIUM-POSTERS****N-249****DEVELOPMENT AND DELIVERY OF A NURSE LED VACUUM ASSISTED CLOSURE THERAPY IN PLEURAL SPACE INFECTIONS**

Lisa Hill, S. Begum, S. Dixon, K. Papagiannopoulos

*Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom***Objectives:**

Conventional treatment of pleural empyemas following either an episode of pneumonia or following surgery often requires treatment with an open window thoracostomy. This necessitates frequent, often painful dressing changes and is associated with prolonged hospitalisation. The wound is often malodorous; causing significant social distress to patients. We assessed the value of utilising vacuum-assisted closure (VAC) therapy in managing patients with a persistent infected pleural space. Nurses played a paramount role, driving the service in the community.

Methods:

12 patients were included in this study. One patient had developed an empyema following an episode of pneumonia. The other 11 patients had recently undergone a thoracic surgical procedure. All of the patients underwent open drainage of the pleural cavity and debridement. The wound was then packed and a VAC therapy system was inserted the day after surgery. The patients then went on to have the VAC dressing replaced every 4-10 days. Patients were discharged home with the VAC therapy system in-situ with the dressing being changed by nurses in the community. Over a period of time the pleural space was cleaned and the residual space obliterated.

Results:

The use of VAC therapy facilitated early discharge, rehabilitation and obliteration of the empyema cavity. None of the patient required a further surgical procedure to definitively close the wound cavity. None of the patients reported any pain or odour associated with the VAC therapy system. Community nurses led the program at domiciliary level.

Conclusions:

Our observations suggest that the use of VAC therapy to treat such patients facilitates early discharge and recovery and improves patient satisfaction. It allows community-nursing teams to get directly involved and take authorship in the management of these patients. It keeps patients away from hospitals, reduces overall stress and links nurses with patients through regular treatment cycles.

Disclosure: No significant relationships.

N-250

POST LUNG CANCER SURGERY REHABILITATIONS. Petersen, P. Mikkelsen, Inge Aagaard, C. Rasmussen, E. Jakobsen*Department of Cardiothoracic and Vascular Surgery, Odense University Hospital, Odense , Denmark***Objectives:**

A specialized program of rehabilitation for lung cancerpatients who have recently undergone lung surgery has been developed

Methods:

The project is conducted as a qualitative study. Data are collected on quality of life, smoking habits, spirometry and 6 minute walk test. The physical rehabilitation begins three weeks post surgery and takes place twice a week throughout the total length of the program of 4-10 weeks. A specially trained physiotherapist is responsible for tests and physical exercise. The physical rehabilitation is accompanied by patient interviews conducted by a specially trained nurse and also by supervision from other health professionals. The areas of focus of the nurse intervention are dyspnea, coughing, nausea, loss of appetite, pain, fatigue, smoking habits, and other psychological symptoms, and consultation with specially trained nurse is offered 3, 6, 9, and 12 months postoperative. At the same time the patient is offered a CT scan. Due to ethical standards no control group of patients was established in this study

Results:

The nurse intervention has shown a clear positive effect on the patients smoking habits. Data shows that physical and emotional rehabilitation has a very positive effect on the patients' life quality, functionality, and capability, and it also shows a positive effect on Spirometry and 6 minute walk test after physical training. The results on the effect on dyspnea, coughing, nausea, loss of appetite, pain, fatigue, smoking habits and psychological symptoms will be presented on the poster

Conclusions:

The project has shown that patients respond positively to the follow-up and rehabilitation after lung cancer surgery and the design is now been successfully implemented in the department

Disclosure: No significant relationships.

N-251

EMERGENCYPROCEDUREINCASEOFUNCONTROLLEDBLEEDINGDURING MINIMALLY INVASIVE SURGERY (VATS AND RATS)Frédéric Lourdaux¹, J.M. Baste¹, C. Picot², C. Peillon¹, J. Melki¹, P. Rinieri¹¹*Thoracic Surgery, Rouen University Hospital, Rouen, France*²*Anesthetic Unit, Rouen University Hospital, Rouen, France***Objectives:**

Uncontrolled bleeding during minimally thoracic surgery is a rare but potentially fatal complication. The time critical nature of such an event and high stress levels for medical and paramedical staff may threaten optimal management. Few reports have addressed this problem. How can we optimize operative management in cases of uncontrolled bleeding during minimally invasive thoracic surgery?

Methods:

A systematic review of a prospective database of VATS and RATS major lung resection was performed. All per-operative events were reviewed with or without conversion. VATS major resection have been done mainly in intent to treat. Contraindication of VATS are bulky and proximal tumors with sleeve resection scheduled. Our study is based on analysis from the surgical, anesthetic and paramedical teams during morbid-mortality meeting.

Results:

From January 2009 to December 2013, we have performed 270 VATS and 40 RATS major lung resections with 9 (2%) cases of uncontrolled bleeding. Blood lost was 2500 (3500-1500) ml with 2 cardiac arrests necessitating massage and defibrillation. No intraoperative death or salvage pneumonectomy was observed. Predifined roles for each team member, practice sessions of simulated events and a new emergency tray with 2 suckers, one rib retractor, large swab on a stick and one vascular clamp may improve future management of this complication.

Conclusions:

Standardization of an emergency procedure for uncontrolled bleeding during minimally thoracic surgery by written protocol, a specific emergency tray and simulation have the potential to optimize the management of this stressful and time critical emergency.

Disclosure: No significant relationships.



N-252

“TIME” PRINCIPLES FOR THE MANAGEMENT OF STERNAL OSTEOMYELITIS WOUND

D. Segura, L. Llanos, Carlos Enrique García Franco, D. Díaz, J.A. Plasencia, J. Herrero
Thoracic Surgery, University Hospital Candelaria, S/C Tenerife, Spain

Objectives:

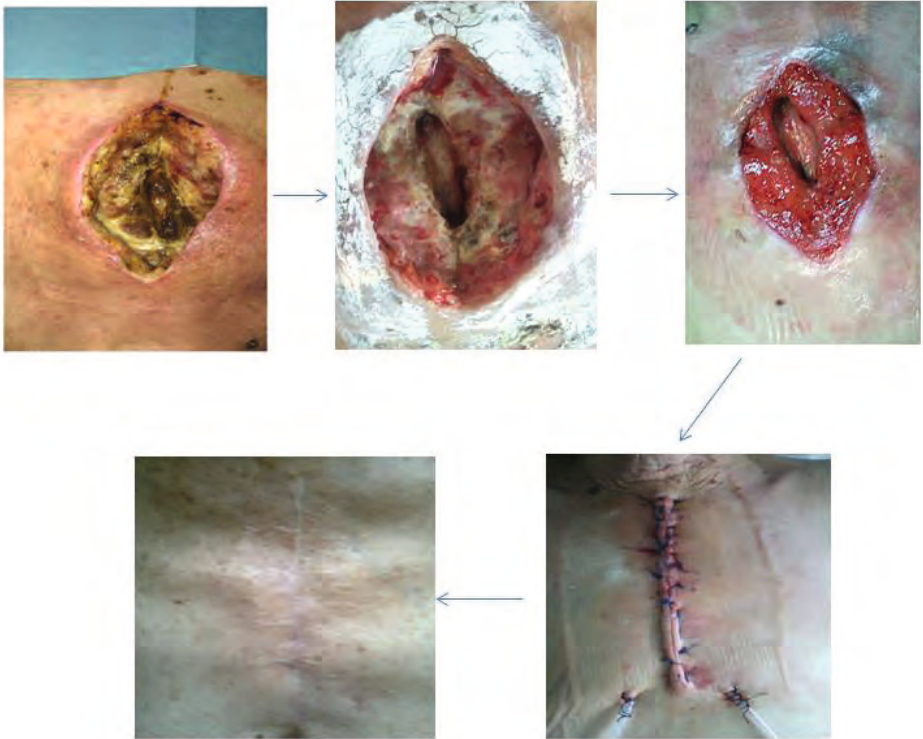
Primary sternal osteomyelitis just represents around 0.3% of all types of osteomyelitis. They normally happen in immunosuppressed patients and its management is in most cases a medical and nursing challenge. We described the case of a 58-year-old female, immunosuppressed due to liver transplantation treatment, suffering from a primary sternal osteomyelitis wound that was managed successfully following TIME wound care principles.

Methods:

TIME wound care goes for: 1) T- Removing Necrotic Tissue; 2) I- Infection control 3) M- Moisture control; 4) E- Stimulation of the wound Edges. This technique was described for the management of chronic wounds. We applied this sort of care to an acute sternal wound infection, after regular nursing care for acute wound infection did not work.

Results:

Firstly surgical opening and debridement of sternal abscess was performed. Intravenous antibiotics and surgical re-debridement were applied, while regular nursing care for acute wound infection was implemented. This care consisted in twice-a-day superficial mechanical debridement/local antiseptics, for 5 weeks; resulting in a poor healing outcome. As soon as TIME technique was started on the wound bed, a favourable healing of it was observed in one week time. Once the wound bed was clean and soft tissue surrounding it proliferating, the defect on the chest wall was covered using pectoralis muscle flap. The healing of the wound and patient recovery were complete. We show in photographs the different moments of the patient's healing process.

**Conclusions:**

Nursing care of an acute infected sternal wound following TIME strategy: a) Reduces wound care variability when treating this rare entity. b) Assists in the rational use of nursing resources. c) Optimizes medical and surgical results. d) Favors adding new clinical evidences

Disclosure: No significant relationships.



N-253

PATIENT JOURNEY INTERVIEWS. A TOOL FOR SERVICE IMPROVEMENT IN THORACIC SURGERY

Sandra Dixon, J. White, K. Papagiannopoulos

Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom

Objectives:

A Thoracic Nurse Specialist (TSNS) initiative in collaboration with the Yorkshire Cancer Network (YCN) led to commissioning of a marketing agency, to develop a Patient Interview Process model and conduct interviews. These aimed at promoting service user involvement in shaping the delivery of services allowing patients and carers to tell their own story in their own words.

Methods:

- interviewer elicits information by encouraging story telling using open questions as prompts
- interviews lasted 45 – 100 minutes
- patient journey is defined from the onset of early symptoms to post-discharge
- written consent obtained prior to commencement of interview
- face to face interviews with patients and carers
- all sessions were recorded and transcribed
- all recordings were destroyed after being transcribed

Results:

These narratives captured a powerful insight relating to the patient experiences and provided informative material about the priority issues to be tackled to improve patient experience. Key deficiencies were identified such as:

- unanimous dissatisfaction with their experience on admission day;
- lack of support dealing with clinical and written information;
- Under utilisation of written information;
- grievances with waiting time in Pre Assessment Clinic;
- lack of support for patients who were carers of spouses and discharge advice;

No access to a person centred service or patient representative group

Conclusions:

- The Patient Interview Report and action plan was published, disseminated and presented to the YCN
- A Patient Education Programme and Enhanced Recovery Programme
- was implemented by the TSNS
- A change of times for patients to ring ward on the admission day was implemented
- Patient information booklets underwent a fresh consultation process and subsequently rewritten by TSNS
- Courtesy, safety calls were established to patients following discharge

Disclosure: No significant relationships.



N-254

SUCCESSFUL DEVELOPMENT OF A NURSE LED THORACIC SURGICAL FOLLOW-UP CLINIC

Jenny Mitchell, E. Belcher, E. Black

Thoracic Surgery, Oxford University Hospitals NHS Trust, Oxford, United Kingdom

Objectives:

The successful introduction of a nurse-led chest drain clinic in Oxford led us to consider expanding our nurse-led services. We devised guidelines and competencies to facilitate the development of a nurse-led thoracic surgical follow-up clinic.

Methods:

We undertook consultation with stakeholders in thoracic surgical follow-up, including respiratory physicians, radiologists, oncologists and lung cancer nurses. Benchmarking was undertaken against established nurse-led follow-up clinics. Trust competencies for advanced nurse practitioners (ANP) were utilised to establish specific novel clinic competencies including qualifications in advanced history taking and physical assessment and non-medical prescribing. An approved post-holder IRMER protocol was established.

Results:

148 patients were reviewed by the ANP between December 2012 and December 2013. Diagnoses included primary and secondary lung cancers, thymoma, endobronchial valve and surgical lung volume reduction surgery, trauma and endobronchial stents. Issues were identified in 86 patients. 39 patients were referred for additional investigations or procedures, requests for review at lung MDT and smoking cessation. In the remaining 47 patients issues were addressed directly at consultation including pain management, infections and pulmonary rehabilitation. Direct communication from the ANP to GP is conducted via letter. There have been no complaints and verbal feedback from patients has been good. There have been no adverse clinical incidents as a result of nurse-led follow-up.

Conclusions:

The establishment of nurse-led thoracic surgical follow-up clinic is safe and feasible. We feel this has resulted in greater patient satisfaction, a reduction in complaints and has enhanced the training of thoracic surgical registrars by their ability to attend new patient clinic consultations.

Disclosure: No significant relationships.

N-255

NURSE LED, LONG TERM INDWELLING CATHETER SERVICE FOR MANAGING RECURRENT MALIGNANT PLEURAL EFFUSIONSDeborah Rowett, S. Dixon, K. Papagiannopoulos*Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom***Objectives:**

Lung cancer remains UK's commonest cause of cancer death. Unfortunately, 80% of patients present with advanced disease. Indwelling chest drainage catheters (PleurX) have been used over a decade in our Department for palliating recurrent malignant pleural effusions. They offer an innovative method of patient symptom control and allow discharge, and care in the community; hence, they free Tertiary centre resources with patient care at familiar, domiciliary level.

Methods:

A standardised, nurse lead protocol is operational following discharge. All patients receive:

- a drainage kit;
- spare dressings;
- a UK medical information pack including a training DVD, and order codes;
- a 'safety net' Nurse Led Clinic appointment for 1st post discharge drainage;
- a warning discharge notice faxed to the local General practitioner within 24 hours.
- A District Nurse and Industry partner/supplier referral requesting drain management and consumables.

Results:

Over 700 patients have been managed so far with PleurX drain insertions ranging from 60 to 90 annually. Patients and District Nurses have the support of a Specialist Nurse Led Clinic and the Thoracic Surgical Nurse Specialist for any advise or suspected complications. A region wide ongoing training module has been developed for District Nurses, with the active participation of the responsible Industry partner. This has become available to all patients and carers who feel comfortable enough to carry out the 'drainage procedure' at domiciliary level or while on holidays offering additional freedom and enhancing quality of life.

Conclusions:

A nurse led Regional service managing long term indwelling catheters offers: 1. standard, safe, audited treatment for all 2. aids District nurse role and adds comfort 3. centres patient care in the community therefore 4. coordinating all available primary care resources while freeing up Tertiary care ones, with a financial benefit to health care systems.

Disclosure: No significant relationships.

N-256

QUALITY OF SLEEP AMONG LUNG CANCER OPERATED PATIENTS

Susanne Petersen¹, L. Thrysøe²

¹*Department of Cardiothoracic and Vascular Surgery, Odense University Hospital, Odense, Denmark*

²*Cardiology, Odense University Hospital, Odense, Denmark*

Objectives:

Studies have shown that patients who have undergone surgery are at risk of getting sleeping disorders after surgery due to surgical stress. Generally, sleeping disorders can have a large impact on the quality of life. Another reason for sleeping disorder in lung cancer operated patients can be a state of crisis due to a short span of time from initial examinations to receiving the diagnosis of e.g. cancer. An internal audit has shown that 7 of 12 operated patients have received sleeping pills in the days after surgery and nurses add that it is difficult to fulfil the optimal conditions to secure the sleep of patients.

Methods:

The study is performed as a two-part quantitative study using a validated questionnaire (Pittsburg Sleep Quality Index, PSQI) which is handed out to the patients during the hospital stay and 3 months after discharge and a questionnaire having focus on factors on elements, which can affect sleep during hospitalisation.

Results:

The answers to the questionnaires 3 months after discharge show that 11 of 18 patients slept worse than before surgery. 7 of 18 patients slept better than before surgery. 6 patients had slept especially well before the operation and of these 3 had a substantial worse sleep after operation. The results show that fellow-patients is described as the most disturbing factor for most patients but talk among staff, noise from wagons, doors and bells are also factors which affect many patients.

Conclusions:

It is concluded that two third of the hospitalised lung surgery patients sleep badly after operation. It is shown that the factors affecting sleep is fellow patients, staff and noise from equipment or other electric installations.

Disclosure: No significant relationships.

N-257

IMPORTANCE OF COMMUNICATING SKILLS/PRINCIPLES IN THORACIC SURGERY CAREBirthe Roelsgaard*Cardiothoracic Surgery, Aarhus University Hospital/skejby, Aarhus, Denmark***Objectives:**

Approximately 200 patients a year are treated with chest tube for pleuraexudat/empyema at Department of Cardiothoracic surgery Aarhus university hospital/Skejby, and approximately 75 of these patients are discharged to further treatment at regional hospital or home Care. Communication the principle for treatment are essential for the outcome for the patients regarding cure and quality of life, as well as the frontline practitioners (nurse/assistant) performing the treatment to have theoretical knowledge and practical training.

Methods:

Case: A 75 year old very active man had an accident with his horse and was hospitalized with haemopneumothorax at a regional hospital. He was treated with chest tube and blood transfusion. When stabilized he was transferred to Department of Cardiothoracic Surgery at Aarhus University hospital/Skejby for further treatment and follow-up. After transferral the standard procedure was followed: three times Sreptase installed in pleura via the chest tube to dissolve blood coagulates. Subsequently when progress in the condition of the patient, the nursing staff continues manual rinse in pleura using lukewarm sodium chloride via the chest tube once or twice a day, and the patient is discharged to home care to continue the procedure for one or two weeks. When the procedure is well performed the patient usually recovers without symptoms and the chest tube is removed within two weeks. This patient felt unwell, tired and lost weight. He came for consultation.

Results:

Photo chest tube

Conclusions:

It is essential the thoracic nurse have a profound knowledge and understanding for the principles of any given treatment, and furthermore are able to communicate to those who take over treatment/care of the patient

Disclosure: No significant relationships.

N-258

NURSE-LED TELEPHONE FOLLOW-UP IN LUNG CANCER OPERATED PATIENTSBirgitte Kjersgaard Rasmussen, D. Lindskjold, B. Borregaard*Department of Cardiothoracic and Vascular Surgery, Odense University Hospital, Odense, Denmark***Objectives:**

Every year 4000 patients in Denmark are diagnosed with lung cancer. Lung cancer is often discovered by chance and the patients have often not had many symptoms or felt ill. When lung cancer is suspected, the patients are included in a standardised course, which secures fast diagnosis and possible treatment. Fast diagnosis may involve the risk that the patients have difficulties relating to the diagnosis and are at risk of becoming psychologically affected. Studies indicate that follow-up with a nurse after discharge from hospital can lead to increased patient comfort.

Methods:

A qualitative interview study. The patients are contacted twice by phone, 3-4 days after discharge and the second time 14 days after the patients have been informed of the result of the pathological test. The conversation with the nurse proceeds on the basis of the needs of the patients and the nurse follow up on these needs.

Results:

Seven patients had a great need of the phone conversation with a nurse after hospital discharge. The conversations dealt with information of the course of the hospital stay, medicine, tending of operation wound, pain, physical activity and the future follow up on the illness. One patient did not have a need for the conversation and the remaining 4 patients had mixed needs. Female patients, younger patient and patients who were single had a greater need for the conversation than the remaining patients.

Conclusions:

Nurse-led telephone follow-up after hospital discharge has a beneficial effect on worries and problematic issues of patients. 68 % of the patients had a great need of contact and 16 % had no need. Since not all patients have a need of telephone follow-up after discharge, it must be further investigated how and if it is possible to differentiate between patients in regard to an offer of contact after hospital discharge.

Disclosure: No significant relationships.

N-259

DEVELOPING A THORACIC SURGICAL SPECIALIST NURSE ROLE WITHIN A CANCER SERVICE

John White, S. Dixon, K. Papagiannopoulos

Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom

Objectives:

The Leeds Thoracic Surgical Unit is a regional centre receiving referrals from 9 hospitals. It delivers 1600 procedures annually of which 80% present from district Hospitals. The main deficiency was lack of nursing link between patients, local MDT'S and the Tertiary centre leading to:

- Inadequate information provision for patients prior to, during and after surgery and post-discharge support
- poor information flows between the Regional centre and District Hospitals
- increase in patient complaints
- increasing pressure for the Leeds based Cancer Nurse Specialist (CNS) team to attend non-Leeds patients

Methods:

A tailor made CNS role was deemed necessary to address several of these issues such as:

- a comprehensive, co-ordinated and timely communication with patients throughout the surgical pathway
- deliver knowledge and understanding of a fully co-ordinated and pre-planned pathway
- liaise comprehensively and timely with the Unit Multidisciplinary teams (MDT)
- educate and professionally develop the hospital and community based teams
- provide robust links to Thoracic Site Specific Group
- and implement quality assurance processes

Results:

Within a year the new Thoracic Cancer Specialist Nurse proved a necessity to a large Tertiary Regional Thoracic service providing:

- a patient education program
- a link between all nursing and medical teams dealing with Thoracic patients
- an educator for Specialist and Community Nurses
- a coordinator to smoothen up complex patient pathways and
- an auditor of patient experience



Conclusions:

Our experience proves that specialist Services require Specialist teams within a wider generic team. They provide an essential link in large Cancer Networks, navigating services through patient centred care and vice versa. They have a wealth of specialist knowledge of the cancer management, can offer advice to both local community teams and patients and present themselves as the beacon of an often complex service.

Disclosure: No significant relationships.

N-260

**DIAGNOSING, STAGING, MANAGEMENT AND SUPPORT OF PATIENTS
DIAGNOSED WITH MALIGNANT MESOTHELIOMA IN THE YORKSHIRE
CANCER NETWORK:
A SURVEY OF MULTI DISCIPLINARY TEAM (MDT) MEMBERS**

Simon Bolton, K. Papagiannopoulos

Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom

Objectives:

To identify how Lung cancer core MDT members view the current state of mesothelioma services with particular emphasis on the role of a specialist MDT, access to surgery and specialist nursing support.

Methods:

All members of the thoracic Network Site Specific Group (NSSG) were invited to participate and complete an online 15 question survey. The local Lung Cancer Nurse Specialist (LCNS) provided a link to the survey and a paper copy was also available at each MDT in the region for a four week period in October November 2012.

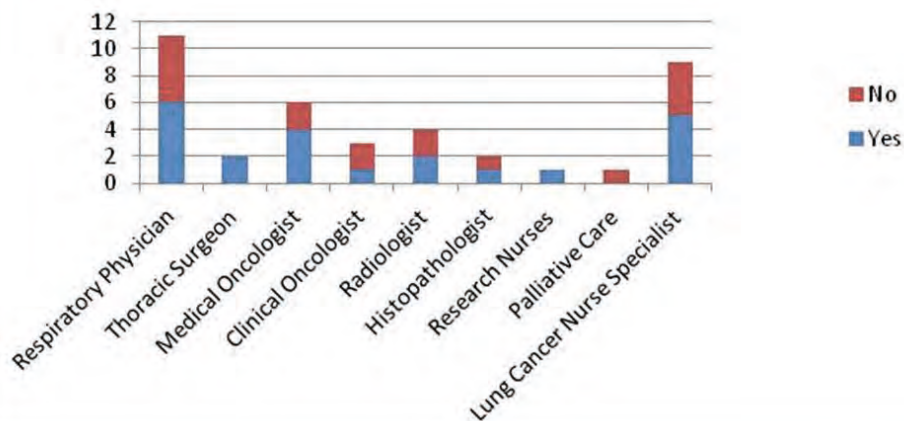
Results:

40 responses were received. All 7 hospital trusts contributed and all core MDT specialities were represented with 3 of the 7 clinical leads taking part. 51% rated the importance of a specialist MDT 1-5 with 49% rating it with greater importance (6-10), on a scale of 1-10. 54% felt there was a need for a regional mesothelioma nurse specialist. 57% felt radical surgical options should be explored further. 92% of responders felt there was a need for a regional mesothelioma support group.

Conclusions:

An expression of interest will be submitted to Mesothelioma UK when they next seek to appoint another 'Regional Mesothelioma UK CNS'. With little clinical evidence to support radical surgery, the thoracic centre in Leeds had in recent years opted not to offer anything more than diagnostic and symptom management procedures. The recent audit has regenerated the feel (Figure 1) that the role of radical surgery should be re visited. The centre has subsequently expressed an interest in becoming a MARS 2 trial centre. The development of a patient/carer information and support group which meets every six weeks has been a fantastic outcome from the survey. Although yet to be formally evaluated, the group has grown in numbers every meeting and has seen a number of supportive relationships flourish.

Q12. Surgery-Lung sparing total pleurectomy/decortication. Do you feel that your patients who are of good performance status should be offered it?



Disclosure: No significant relationships.

N-261

CAN AND SHOULD A PATIENT/CARER INFORMATION AND SUPPORT GROUP ADDRESS THE UNMET NEEDS OF PEOPLE AFFECTED BY MESOTHELIOMA? A NURSE LED AUDIT

Simon Bolton, K. Papagiannopoulos
Thoracic Surgery, St James's University Hospital, Leeds, United Kingdom

Objectives:

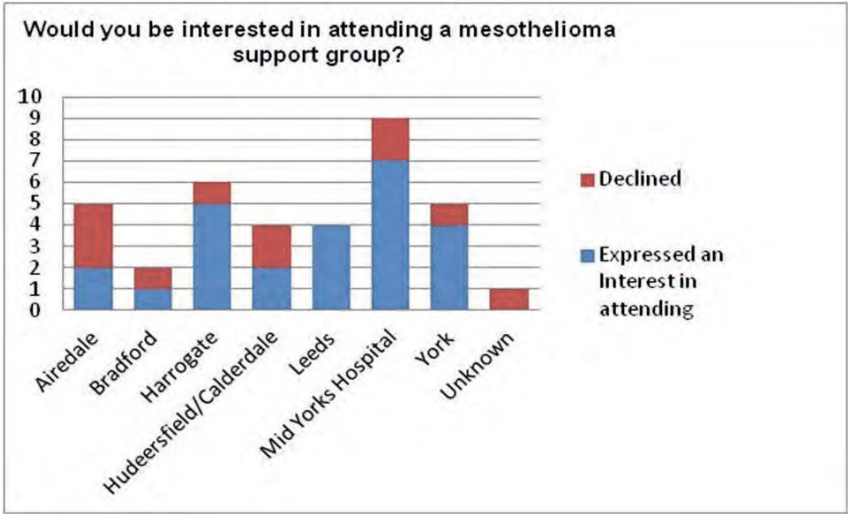
To establish a mesothelioma patient/carer information and support group across a region served by 7 NHS Trusts. Currently in the UK, approximately 2500 people are diagnosed with malignant Mesothelioma each year and within the Yorkshire Cancer Network Region over 100 new cases are diagnosed annually. All treatments for Mesothelioma are currently considered to be non-curative and 50% of patients die within a year of diagnosis. The Yorkshire Cancer Network was made up of seven NHS Trusts which covered a population of approx 2.8 million.

Methods:

A short survey was sent to all known mesothelioma patients across the region by the local lung cancer CNS's. The main aim was to determine the level of interest in such a group. The survey also sought their views on how frequently the meetings should take place, how far they would be willing to travel and would they attend alone or with a family member, friend or carer. Another important consideration was to explore participation without reimbursement.

Results:

36 patients responded to the survey. Over 64% of those who responded expressed an interest in attending a support group.



Conclusions:

The group now meets every 6 weeks in a convenient venue. Numbers increased with every meeting. The CNS's from the 7 local trusts have agreed a rota whereby there will always be at least 3 nurses to facilitate and provide advice and support at each meeting. Clinicians from the hospitals have responded to requests to provide educational sessions to the group. An initial start up grant of £1000 was secured by applying to a development fund set up in the memory of a former member of the Yorkshire Lung Cancer Nurses Group (herself an advocate of patient support groups). A further annual donation of £2000 has been awarded by a well known mesothelioma research fund.

Disclosure: No significant relationships.

NOTES

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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