B-001
VATS PLEURODESIS THROUGH GENERAL OR AWAKE ANESTHESIA IN PATIENTS WITH RECURRENT PLEURAL EFFUSION. A RANDOMIZED STUDY
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Objectives: Recently, awake VATS under thoracic epidural anesthesia (TEA) has been employed to treat a series of thoracic conditions. We aimed to assess perioperative outcome of this approach in managing patients with recurrent pleural effusions.

Methods: Between January 2008 and October 2010, 40 patients with recurrent pleural effusion were randomized by computer to undergo VATS pleurodesis performed either by TEA (n=20) or general anesthesia and one-lung ventilation (n=20). Primary end-points were pain control assessed by VAS and the need for additional, perioperative, medical care scored ranging from one (no additional care) to three (major additional care), assessed at fixed time-points. Perioperative changes in PaO2/FiO2 ratio and FVC were regarded as secondary outcome measures.

Results: Overall, 36 patients had cancer-related effusion. Talc insufflation and biopsy was performed in all instances via a single-trocars access, with no difference in feasibility score between groups. Perioperatively, patients undergoing awake VATS showed better results in pain control 1-h after the operation (P=0.03) and medical care score (P=0.03). Repeated-measure ANOVA showed a better preservation of perioperative respiratory function in the study group with smaller changes in PaO2/FiO2 (P=0.01), and in FVC (P=0.007). Yet, in both groups, medical care score was significantly correlated with perioperative PaCO2 from baseline (P=0.03) and VAS-score (P=0.004). Time to drainage removal and rate of effusion recurrence were similar between groups.

Conclusions: In this randomized study, awake VATS pleurodesis resulted into a better medical management, superior preservation of respiratory function and equivalent recurrence rate when compared to results of the general anesthesia group.

B-002
RE-EVALUATION OF THE CURRENT PROGNOSTIC VALUE OF VISCERAL PLEURA INVASION IN STAGE IB NON-SMALL CELL LUNG CANCER USING THE PROSPECTIVE MULTICENTER ACOSOG Z0030 TRIAL DATA SET
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Objectives: Examine the modern prognostic significance of visceral pleura invasion (VPI) in stage IB (T2aN0M0) non-small cell lung cancer (NSCLC) within the context of the seventh edition TNM classification using the data set from a recent prospective multicenter trial.

Methods: One thousand one hundred and eleven early-stage NSCLC patients participating in the ACOSOG Z0030 trial (1990-2004) and submitted to curative pulmonary resection were analyzed. After excluding T2b tumours (>5 cm and >7 cm) and non-size-based T2 factors other than VPI, 289 patients were categorized as stage IB NSCLC (T2aN0M0). Patients were divided into three groups according to size and VPI: tumours ≤3 cm with VPI (‘VPI-alone’, n=83), tumours >3 cm and ≤5 cm without VPI (‘size-alone’, n=156), and tumours >3 cm and ≤5 cm with VPI (‘VPI+size’, n=50). Multivariate Cox regression analysis was used to assess the association of VPI and size with survival, adjusting for age, gender, histology and type of resection.

Results: VPI in stage IB was identified in 133 patients (46.0%). The VPI+size group had a five-year survival rate of 55.0%, significantly shorter when compared to the VPI-alone group (68.3%; P=0.009), and the size-alone group (67.2%; P=0.021). No difference was found between the VPI+size and the VPI-alone groups. Multivariable analysis showed that VPI associated with size (tumours >3 cm and ≤5 cm) was an independent negative prognostic factor for long-term survival, along with older age and limited resection.

Conclusions: Stage IB patients with VPI and tumours >3 cm and ≤5 cm have significantly worse prognosis than those with “T2a” tumours classified as such on the basis of VPI or tumour size alone. Upstaging T2a patients in the VPI+size group from the current IB status to stage IIA may be warranted.

B-003
THE IMPACT OF THE SEQUENCE OF PULMONARY VESSEL LIGATION DURING ANATOMIC RESECTION FOR LUNG CANCER ON LONG-TERM SURVIVAL - A PROSPECTIVE RANDOMIZED TRIAL
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Objectives: The aim of this prospective randomized trial was to assess the influence of the sequence of pulmonary vessel ligation during anatomic resection on long-term survival in patients with NSCLC.

Methods: This prospective randomized study included 385 patients treated surgically by lobectomy or pneumonectomy with standard lymphadenectomy between 1999 and 2003. Patients were randomly assigned to either primary ligation of the pulmonary artery or arteries (group A - 215 patients) or primary of the pulmonary vein or veins (group V - 170 patients). Patients in whom the sequence of vessel ligation was affected related with perioperative PaCO2 from baseline (P=0.03) and VAS-score (P=0.004). Time to drainage removal and rate of effusion recurrence were similar between groups.

Conclusions: Sequence of pulmonary vessel ligation during anatomic resection. There is a trend to lower number of distant metastases in patients with pulmonary vein ligated first.
B-004 DOES FAST-TRACKING POLICY INCREASE THE READMISSION RATE AFTER MAJOR LUNG RESECTION? A CASE-MATCHED STUDY
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Objectives: The most recent evolution of patient management after thoracic surgery implies the concept of fast-tracking. Since 2008 our unit has implemented a program based on clinical protocols and standardized pathways of care aimed to reduce the postoperative stay after major lung resection. The objective of this study was to verify the safety of this policy by monitoring the patient readmission rate.

Methods: This is a prospective observational study on 914 consecutive pulmonary lobectomies performed in our institution from January 2000 to October 2010. Since we started the fast-tracking program in January 2008, we divided the patients in two groups: early period (678 patients, 2000-2007) and recent period (236 patients, 2008-October 2010). Several baseline and operative factors were used to build a propensity score that was applied to match the recent group patients to their early group counterparts. These two matched groups were then compared in terms of early outcome and readmission rate. Readmission was defined as a re-hospitalization for any cause related to the operation within 30 days after discharge. We excluded from the analysis those patients with in-hospital mortality.

Results: Propensity score yielded 232 well-matched pairs operated on in the early (non-fast-tracked patients) and most recent period (fast-tracked patients). The fast-tracking management resulted in a postoperative stay reduction of 2.8 days (P=0.0001), with a three-fold higher proportion of patients discharged before the sixth postoperative day (P=0.0001). Nevertheless, we did not observe differences in terms of readmission rate between the two periods.

Conclusions: In our experience the implementation of a fast-tracking program after pulmonary lobectomy resulted very effective and safe. It led to a postoperative reduction of hospital stay without an increase of the readmission rate.

B-005 TWINTED SINGLE LUNG TRANSPLANTATION: A PRIVILEGED MODEL FOR THE STUDY OF RECIPIENT DEPENDENT FACTORS FOR OUTCOME
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Objectives: Lung transplantation is the only life-saving treatment for end-stage respiratory disease. Outcome will depend on graft quality, surgical conditions and recipient factors. Twinned single-lung transplantation is defined as two different recipients treated with lung grafts from the same donor. Recipient dependent factors of outcome can be studied more accurately as graft quality is supposed equal for both recipients.

Methods: We reviewed all single-lung transplantation performed in France between 1998 and 2008 in the French registry run by the “Agence de Biomédecine” to record all donors to assess graft quality and all twinned recipients. Whole medical history and transplantation outcome was reviewed for each patient and compared to its twin recipient. End-points were primary graft dysfunction (PGD) grade 3, one month, three months and 12 months survival.

Results: A total of 387 single-lung transplantations were performed in 10 French centers. 90 donors led to 180 twinned recipients. Statistical analysis revealed significantly different outcome for PGD only. PGD was significantly higher (P<0.05) in fibrosis recipients compared to emphysema twins. In 28 pairs (31%) outcome was discordant for PGD, and fibrosis was significantly more often involved compared to emphysema (P=0.04). Sixty-two pairs had similar outcome: two pairs showed PGD in both recipients while 60 pairs were free of PGD.

Conclusions: We conclude that recipient’s disease is a major determinant of outcome. Fibrosis is associated with an increased risk for PGD.

B-006 CONTROL OF POST-THORACOTOMY PAIN BY TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS): EFFECT ON SERUM CYTOKINE LEVELS, VISUAL ANALOGUE SCALE, PULMONARY FUNCTION, AND MEDICATION
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Objectives: Transcutaneous electrical nerve stimulation (TENS) has been used to control post-thoracotomy pain with contrastant results. We aimed to assess the efficacy of TENS on post-thoracotomy pain in relation to response of serum cytokines (not been investigated before), visual analogue scale (VAS), pulmonary function, and medication.

Methods: Forty-six patients scheduled to undergo standard postero-lateral thoracotomy were enrolled and randomized in two groups: TENS group (23 patients) who received postoperatively TENS for five days and control group (23 patients) without TENS. In both groups serum cytokines (IL-6, IL-10, TNF-α) were measured by ELISA before surgery and at 6, 12, 24, 48, 72, 96 and 120 postoperative hours (POHs). Yet, we valued how many doses of analgesia were given during postoperative period of five days; the pain score was measured using visual analogue scale (VAS) on 6, 12, 24, 48, 72, 96, and 120 POHs while pulmonary function tests (FEV1, FVC) of predicted value) on 72, 96, and 120 POHs. Variables were expressed as median and range; intergroup differences were assessed by Mann-Whitney test.

Results: Serum IL-6, IL-10, and TNF-α levels in TENS group were significantly lower than in control group during the entire postoperative course. Recovery of FEV1, and of FVC was statistically better in TENS group than in control group on 72, 96 and 120 POHs. VAS score in TENS group was significantly lower than in control group on 12, 24, 48, 72, 96, and 120 POHs. Finally, 25.9% of TENS patients required narcotics compared with 69% of control group patients during the five-day postoperative period (P<0.05).

Conclusions: TENS is a valuable strategy to alleviate post-thoracotomy pain with reduction of cytokine production and of analgesic consumption, and with positive effects on pulmonary ventilation function.
but 44% of the trainees have an abnormal Epworth Sleepiness score. Fifty-one percent of the trainees were screened positive for depression, 25% for burn out positive screenings. Additional work is needed to identify the characteristics of this subgroup and to fight against the cause of these symptoms.

Conclusions: In Europe, training in surgical oncology is linked to a good quality of life. However, a subgroup of trainees presents a high-level of depression and burn out positive screenings. Additional work is needed to identify the characteristics of this subgroup and to fight against the cause of these symptoms.

Results: Thirty-one residents participated in the study (12 experienced, six intermediate, and 13 novice). All 12 experienced participants completed the lobectomy. The other groups were less successful with four of six in the intermediate group and five of 13 in the novice group completing the lobectomy (P=0.002). Mean times for lobectomy-penalty minutes were 35.6±8.1 (experienced), 50.5±13 (intermediate) and 54±20 (novice). Differences between groups were statistically significant for experienced vs. novice (P=0.001) and experienced vs. intermediate (P=0.04). Content validity was assessed by the 18 participants who had previously seen a thoracoscopic lobectomy with a mean of 9.2 of 10 possible points.

Conclusions: The thoracoscopic lobectomy simulator used in this study demonstrates acceptable validity and can be a useful tool for teaching thoracoscopic lobectomy to trainees or experienced surgeons.

Session III - Interesting Cases
Monday, 6 June 2011 11:00-11:30

I-010 MANAGEMENT OF AN AORTOESOPHAGEAL FISTULA IN A PATIENT WITH ARTERIA LUSORIA
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Objectives: We describe the first case of aortoesophageal fistula due to left clavicle Kirschner wire (KW) migration in a 58-year-old man with arteria lusoria. Management for this patient was not optimal. We analyze errors that led to complications that could have been fatal.

Methods: The patient was hospitalized in emergency for chest pain management. Radiologic exams revealed KW migration from the left clavicle to the mediastinum, through the origin of the left subclavian artery (LSA) and the aortic arch. The KW finished its course close to the esophagus, where there was surrounding infiltration (no hemo-or pneumomediastinum).

Results: Initial surgery (performed in another center) was made by a median sternotomy. The identification of the KW and its extraction was impossible. An extension by a supraclavicular cervicotomy and a thoracotomy in the first left intercostal space was necessary. Following extraction of the pin, blood appeared into the mouth followed by hemorrhagic shock. No repair was possible by a sternotomy. Blackmore tube was placed and the patient was transferred to the ICU for treatment of the shock. He was then redirected to our center. We chose stent-graft treatment to close the aortic wound associated with transposition of the lusoria into the right common carotid artery. No intervention was performed on the esophagus because the wound was spotty, with no signs (biology/radiography) of mediastinitis. Postoperative course was marked by pulmonary complications requiring tracheotomy and left pleural decortication. Control CT-scan performed 6 weeks later showed a patent carotid to subclavian transposition and no signs of mediastinitis. Six months later, the patient is alive with no specific treatment.

Conclusions: Intra-thoracic migration of orthopaedic wires is a common complication of clavicle osteosynthesis and must be managed in centres with cardio-thoracic and vascular capabilities. Wires must be withdrawn as soon as possible following bone healing.

I-011 ACUTE HEMOPTYSIS AND PULMONARY HEMORRHAGE AFTER SPORTS
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Objectives: Intralobar sequestration is a rare anomaly that is usually diagnosed with symptoms of cough, expectation, or recurrent pneumonia in children.

Methods: We experienced a case of an 11-year-old boy with massive hemoptysis after judo sports. He was admitted to hospital and intubated due to
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respiratory failure. His chest computed tomography (CT)-scan which was performed without contrast agent revealed a large intrapulmonary hematoma and hemothorax, mimicking traumatic hemothorax. Results: Due to blood loss and circulatory instability, emergency thoracotomy was performed and a massive intralobar hemorrhage due to a ruptured intralobar sequestration artery was found. After lobectomy the patient was stabilized and extubated, but postoperative ARDS occurred. However, the young patient was discharged home three weeks later. Conclusions: In young patients with hemoptysis and intrapulmonary hemorrhage after trauma, the possibility of ruptured intralobar sequestration should be kept in mind. This report shows that intralobar sequestration can have a dramatic course of disease, and for this reason non-urgent resection should be considered in all patients when this diagnosis is made.

I-012
TRACHEAL LACERATION
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Objectives: The case is about a rare complication of a relatively new method of treatment of thyroid nodules (thermal Nd:YAG laser ablation, LTA).

Methods: The patient first refused surgery, then underwent the LTA of her thyroid goiter followed by an important late complication (tracheal perforation), which necessitated a total thyroidectomy plus tracheal reparation; the definitive histology showed an area of papillary carcinoma, and radioactive iodine was definitively administered.

Results: The patient, a 73-year-old woman with a normo-functioning multinodular goiter, refused surgery and underwent, in the endocrine unit of our hospital, LTA of thyroid nodular tissue under ultrasound real-time assistance. There was no early complication. After almost two months from the procedure the patient had hoarse, dyspnea and stridor; a first bronchoscopy showed a greyish, irregular 1 cm² area of the tracheal mucosa in the right posterior-lateral part of the second and third ring with integrity of the mucosa. The patient was treated by antibiotics and cortisone. After one week, a second bronchoscopy showed clearly a necrotic area, with some tissue (thyroid) penetrating into the tracheal lumen, causing a partial obstruction. The patient was operated on through a cervicotomy. An intense inflammatory and fibrotic reaction completely surrounded the right inferior laryngeal nerve. The left nerve ran normally. After the completion of the thyroidectomy, it was evident an orifice (diameters 2×1 cm) on the right posterior-lateral part of the second and third tracheal ring, through which the thyroid penetrated into the trachea. A resection-anastomosis was not necessary, and it was enough to close the tracheal defect by five sutures of PDS® 4-0. The postoperative course was normal. The histology showed a multinodular goiter with a capsulated focal area of papillary carcinoma and the patient was treated with radioactive iodine remnant ablation.

Conclusions: The follow-up and endoscopic control 10 months after the operation are normal.
Session IV - Moderated Posters
Monday, 6 June 2011
13:00-14:00

P-013
SURGICAL TREATMENT OF A RARE CASE OF EPITHELIOID HEMANGIOENDOTHELIOMA OF THE AZYGOS VEIN
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Objectives: Epithelioid hemangioendothelioma of soft tissues is a rare low-grade vascular tumour, with variable malignancy. Mediastinal localization is exceptional. We report the first case ever described in the literature of a radically resected epithelioid hemangioendothelioma of the azygos vein.

Methods: A 47-year-old man presented to our institution with an asymptomatic incidental neck-chest CT evidence of a 3-cm mediastinal mass, resembling a station 4R lymphadenopathy, with rather distinct margins, strictly adjacent to the azygos vein. 18F-FDG-PET/CT revealed a SUV max of 2.3. Fiber bronchoscopy with trans-tracheal needle aspiration of station 4R yielded non-diagnostic cytology result. A right lateral thoracotomy revealed an ovoid mediastinal mass originating from the azygos vein, unreatsectable from it but showing cleavage from the superior vena cava. The mass with the involved azygos vein was resected en bloc by vascular stapler.

Results: Histopathology revealed a venous epithelioid hemangioendothelioma arising from the azygos vein. For the low mitotic rate and small tumour size, no adjuvant therapy was administered. Total body CT-scan at one year from surgery shows neither local recurrence, nor distant metastases.

Conclusions: Epithelioid hemangioendothelioma should be considered in the differential diagnosis of mediastinal masses in adult patients. After radical removal prognosis is generally favourable, but strict follow-up must be performed because aggressive forms have been described.

P-014
TRAUMATIC FALSE ANEURYSM OF THE LEFT VENTRICLE: A SERIOUS COMPLICATION AFTER VIDEO-ASSISTED THORACOSCOPIC SURGERY
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Objectives: Video-assisted thoracoscopic surgery has been rapidly accepted as a safe and credible technique since 1990. Indications are well defined in the management of thoracic diseases. Lung injury is one of the main complication described after video-assisted thoracoscopy. There are few data about cardiac trauma and false aneurysm of left ventricular wall has not been reported yet.

Methods: We report the case of a 66-year-old woman with a left recurrent supplicative pleurisy. Medical treatment failed to reverse the infectious syndrome despite 15 days of intravenous antibiotics and pleural drainage. A video-assisted thoracoscopy was then performed for bacterial sampling and surgical drainage. A massive hemotherax happened after thoracoscope intruion. A left thoracotomy was necessary to stop bleeding because of severe pleural adherences.

Results: An apical systolic murmur was found two weeks later during a systematic clinical examination. The patient was asymptomatic and had no personal history of cardiac disease. Color Doppler echocardiography showed two spurious aneurysms on the left ventricular free wall without any hemopericardium. There was any left ventricular dysfunction at that time and the patient never presented any acute coronary syndrome since the surgical procedure. Pericardial enhancement around the left ventricular wall was observed on the computerized tomography thoracic scan with contrast. After careful excision of the two false aneurysms, a surgical repair with strengthened suture was realized under cardiopulmonary bypass. The postoperative course was uneventful.

Conclusions: This case highlights a rare complication of thoracoscopic surgery: left ventricular traumatic false aneurysm. It is associated with a high mortality rate due to spontaneous rupture. Color Doppler echocardiography and computerized tomography scan with contrast are useful for diagnostic. Traumatic aneurysms of the heart to have been involved in intensive care unit in association with cardiovascular surgeons.

P-015
WANDERING CERVICAL SCREW: FROM CERVICAL VERTEBRA TO INTERMEDIARY BRONCHUS
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Objectives: A foreign body was detected incidentally on a chest X-ray of a 75-year-old male patient.

Methods: History of cervical surgery for anterior plate fixation of the cervical vertebrae, was present. Although loosened screw was absent at follow-up cervical X-ray, it was unnoticed by the neurosurgeon.

Results: Screw eroded in the trachea and migrated through right main bronchus. Screw was detected in the intermediary bronchus by flexible bronchoscope and extracted by rigid bronchoscope. Postoperative chest X-ray was normal.

Conclusions: This case exhibits a very uncommon complication of a cervical surgical procedure.

P-016
PNEUMOMEDIASTINUM AND CERVICAL SUBCUTANEOUS EMPHYSEMA AS FIRST SIGNS OF COLON PERFORATION
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Objectives: Pneumomediastinum secondary to colon perforation occurred very rarely. A case of pneumomediastinum and cervical subcutaneous emphysema resulting from a retroperitoneal sigmoid diverticulum perforation is reported.

Methods: A 56-year-old man presented for fever and swelling of the face and neck suddenly developed. A diffuse subcutaneous emphysema with crepitations of soft tissue was present in the upper thorax, neck and palpbral regions. Chest examination was normal. The abdomen was slightly tender on deep palpation in the left lower quadrant, without signs of peritoneal irritation. A chest X-ray showed an unexpected pneumomediastinum; no air was present below the diaphragmatic dome. A chest CT-scan confirmed free air in the mediastium, subcutaneous emphysema with no signs of pneumothorax. Bronchoscopy disclosed no evidence of tracheo-bronchial lacerations. A spontaneous pneumomediastinum was hypothesized. Abdominal soreness was stable; an abdomen-ultrasound revealed an uncomplicated acute diverticulitis. Peristalsis was active; body temperature, white blood cell and platelet counts were normal. Twelve hours later, patient was febrile and leukocytosis was noted. A contrast enema demonstrated free gas in stomach and air in the retroperitoneum. An urgent laparotomy was performed.

Results: Sigmoid bowel was fixed on left psoas muscle. After mobilization, a perforation on the posterior wall of the sigmoid colon and a large retroperitoneal abscess were noted. The drainage of the abscess was followed by a segmental colon resection and end-colostomy. Culture of the pus revealed aerobic and anaerobic micro-organisms. Pneumomediastinum and subcutaneous emphysema disappeared quickly after the operation. Postoperatively the patient developed a right pulmonary embolism and anti-coagulant therapy was started. Histopathology examination showed strong inflammation with no signs of tumour; the hole measured 0.6x0.5 cm surrounded by inflamed and thinned mucosa. Three months later he underwent intestinal recanilization. Eighteen months postoperatively he remains symptom-free.

Conclusions: Pneumomediastinum and cervical subcutaneous emphysema occurred very rarely after intestinal perforation. Seemingly unrelated complaints must be correctly interpreted to avoid life-threatening complication.

P-017
BRONCHIAL PERFORATION BY ANTERIOR THORACIC PLATE
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Objectives: Serious complications after anterior spine surgery are rare. They are mainly of infectious origin, pulmonary or implant-related. We report a complication that occurred three years after implantation of an anterior thoracic plate for fracture.
Methods: This is the case of a 48-year-old man who suffered three years earlier a thoracic spine trauma which necessitated anterior and posterior fixation. He was referred for removal of the anterior placed material, the material had indeed broken through the right bronchus.

Results: The patient was operated through a posterolateral thoracotomy and the material on the thoracic spine was exposed. One corner of the plate disappeared in the bronchus. The remaining screws were removed and a laceration of 2-5 cm in the right bronchus was exposed. This was primarily closed with resorbable material over a intraluminal stent as a protection for collaps. The suture was posteriorly reinforced with an intercostal muscle flap. The postoperative course was normal and his pulmonary function has returned to normal.

Conclusions: We report, to our knowledge, the first case of bronchial erosion by anterior thoracic plate for spine fixation.

P-018
MULTIMODAL TREATMENT OF SECRETING MEDIASTINAL PHEOCHROMOCYCTOMA
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Objectives: Pheochromocytomas are catecholamine-secreting neuroendocrine tumours arising from adrenal medulla chromaffin cells or extra-adrenal paraganglia, which are referred to as extra-adrenal pheochromocytomas or paragangliomas. Due to secretion they cause potentially lethal cardiovascular complications making their management demanding. We describe a case of complicated mediastinal pheochromocytoma.

Methods: In 2002, a 21-year-old man presented thoracic pain and pleural effusion. CT-scan revealed a right posterior mediastinal 10 cm sized tumor. During surgical biopsy a massive bleeding was hardly managed and an hypertensive crisis occurred. Surgical intervention was interrupted. Histology revealed a pheochromocytoma. Urinary and plasma catecholamines, urinary metanephrine and vanillylmandelic acid were abnormally high. In order to remove the tumor, the patient underwent selective arterial embolization. Despite premedication, the procedure was interrupted because of a life-threatening hypertensive crisis. Partial embolization was obtained. Operative risks were considered prohibitive, therefore he was referred to I-MIBG metabolic therapy. In 27 months he received a total activity of 27.65 GBq.

Results: Periodic follow-up shows tumor size stability and absence of catecholamines secretion. Surgery was avoided considering still high operative risks and good results achieved by metabolic treatment.

Conclusions: Two percent of pheochromocytomas are mediastinal. Their management is based on preoperative antihypertensive medication and surgical removal. Treated benign tumor survival rate is 95%. Malignancy is rare and related to bad prognosis (five years survival rate is 50%). Hypertension persists in 50% of all patients. However, particular cases present intra and perioperative complications requiring a different treatment with less invasive procedures. Our successful experience suggests arterial embolization and I-MIBG therapy as alternative. Results of metabolic therapy are encouraging and two other cases of preoperative embolization are reported. We conclude that when surgical removal is not achievable, a combined multimodal treatment should be considered to obtain a long-term disease stabilization and absence of secretive activity.

P-019
A CASE OF PERSISTENT PNEUMOTHORAX IN RHEUMATOID DISEASE
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Objectives: We describe the case of a woman affected by rheumatoid arthritis who developed a multiple, severe pleuro-pulmonary pattern of the disease, refractory to surgery. The ‘wait and see’ strategy, instead of the advanced surgical option of ‘open thoracotomy’, gave a satisfactory clinical and radiological recovery.

Methods: A 43-year-old female patient in treatment for rheumatoid arthritis, presented with cough, chest pain and dyspnoea. CT-scan showed bilateral parenchymal nodules, left exudative pleurisy and subsequent pneumothorax. Regarding family history, spontaneous pneumothorax occurred in two brothers. Pleural drainage evacuated puruloid fluid with prolonged air leaks. Rheumato logic therapy was interrupted to restore immunocompetence and pleural toilette was performed through thoracotomy. No peel was identified and pleural surface was porous, with air and puruloid exudate leaking from it.

Results: Cultures on parenchymal exudates and pleural fluid were negative. Histology showed pleuro-parenchymal flogosis with fibrinoid stratiﬁcation on pleural surface. The woman returned to methotrexate, methylprednisolone and ibuprofen therapy and became a chronic carrier of pleural drainage with prolonged air leaks, despite a second operation for parenchymal sutures. We decided not to proceed to open window thoracotomy and a ‘wait and see’ strategy was adopted. The patient was discharged with a Heimlich valve system. Chest X-rays after out-patient tube removing showed a non-totally expanded left lung; clinical checks revealed air from thoracontomy incision during cough. Hydroxylcholine sulfate was added to therapy. A two months-outpatient clinical visit showed the complete thoracotomy incision healing, and the total re-expansion of the left lung with absence of the parenchymal nodules at CT-scan.

Conclusions: Pneumothorax is not an exceptional complication of rheumatoid arthritis and requires full integration of medical and surgical therapy, often for a prolonged period. Probably, a simple drainage and medical therapy are the best treatment.

P-020
PRIMARY PULMONARY PARAGANGLIOMA
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Objectives: Primary pulmonary paragangliomas (PPP) are very uncommon tumors arising from paragangliocytic tissue. Two types of primary pulmonary paragangliomas have been reported; multiple miliary tumors and solid tumors. Multiple miliary paragangliomas probably arise due to an ischemic condition of paragangliocytic cells. Solid paragangliomas are rare. In the last WHO classification parasymphathetic paragangliomas were named as PPP.

Methods: A 59-year-old non-smoker woman, presented with cough was referred to our clinic. Her physical examination and laboratory tests were within normal ranges. Chest X-ray showed a solid mass sized 4 cm at right lower zone. CT-scan revealed a 4.2×3.3 cm nodular homogene, annular mass in the superior segment of right lung lower lobe besides multiple enlarged mediastinal lymph nodes. Bronchoscopy and transthoracic needle biopsy revealed no sign of malignancy. In PET/CT, there was pathologic increased uptake on mass-SUVmax= 4.3.

Results: Mass was totally resected via thoracotomy. Intraoperative frozen section study revealed malignant epithelial tumor so a right lower lobectomy and mediastinal lymph node dissection were performed. Macroscopic examination revealed a 4 cm sized, well circumscribed, homogene, solid tumor. Histology showed perivascular extension of fascia, S-100 protein and vimentin, there was negative reaction for actin, vimentin, desmin, melan-A and a Zellballen pattern was present so final histopathologic diagnosis was reported as a primary pulmonary paraganglioma.

Conclusions: The patient was discharged on the fifth day after operation in good clinical condition.

P-021
RUPTURE OF THE TRACHEA COMBINED WITH INJURY TO THE BRACHIOCEPHALIC TRUNK
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Objectives: Traumatic rupture of the trachea caused by an indirect mechanism is a rare yet life-threatening injury. Similarly, blunt trauma to the brachiocephalic trunk is also a rare, but often lethal complication of deceleration injuries. Concurrent injury to both structures leads to asphyxia or exsanguination and usually ends fatally even before adequate treatment is provided.

Methods: We present the case of a 19-year-old male, who was treated at the First Department of Surgery in Olomouc after a car accident during which the man suffered direct rupture of the trachea combined with a pseudoaneurysm of the brachiocephalic trunk. Injury to the trachea was preoperatively repeatedly described as a mere contusion; vascular injury was overlooked and diagnosed only peroperatively. The arterial aneurysm was resected and replaced with a temporary PTFE prosthesis, which enabled satisfactory access to both tracheal stumps.
Results: Rupture of the trachea was repaired using a transthoracic approach upon mobilization and dissection of the aorta and superior vena cava. A temporary arterial by-pass was then shortened to the appropriate length. The postoperative course was without complications; follow-up virtual broncho-CT and MR angiography describe a favorable postoperative state.

Conclusions: The severity of concurrent injuries determines the chance of survival. Correct diagnosis is founded on an understanding of the mechanism of injury and correct interpretation of the results of paraclinical examinations. Immediate surgical treatment provides the best chance of a good result.

P-022
ONE-STAGE OPERATION VIA RIGHT THORACO-PHRENIC-LAPAROTOMY AND VATS FOR A GIANT HEPATO-PULMONARY HYDATID CYST WITH BRONCHOBILIARY FISTULA
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Objectives: A case of giant hepato-pulmonary hydatid cyst with broncho-biliary fistula is presented. We discuss in detail the clinical steps from the admission of the patient to the discharge. All that is supported by videos of the CT scan and of the procedure.

Methods: A 79-year-old man was admitted to our institution with the complaints of cough, hemoptysis, and right-sided chest pain. While being hospitalized, the patient presented an episode of pydemic vomica. Ultrasound and computed tomography showed a giant hepato-pulmonary hydatid cyst with broncho-biliary fistula. The optimal treatment plan was established by an urgent multidisciplinary meeting and the patient subsequently underwent a right thoracopreaparotomy, right lower lobectomy, pericycystectomy and resection of the broncho-biliary fistula. VATS was an useful adjunct in performing the lower lobectomy through the thoracotomy at the 10th intercostal space. The technique used is described in detail and shown in video clips.

Results: The patient had a successful surgical outcome and he was discharged home after 28 days. The patient at the one-year follow-up visit is well, without any evidence of cyst recurrence or functional disability. Conclusions: Bronchobiliary fistula is an uncommon but life-threatening complication of hydatid disease of the liver. Surgery is the treatment of choice. The proposed technique was effective in the management of this challenging case with excellent functional result and control of the disease.

P-023
IMPACT OF EPIDERMAL GROWTH FACTOR RECEPTOR AND KRAS MUTATIONS ON CLINICAL OUTCOME IN RESECTED NON-SMALL CELL LUNG CANCER PATIENTS
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Objectives: Final results of prospective randomized study to assess applicability of Tachosil® on mediastinum after systematic lymphadenectomy are presented.

Methods: In 29 patients from the Tachosil® group 1-3 large pieces of Tachosil® on mediastinum after systematic lymphadenectomy were presented.

Results: EGFR and KRAS mutations were detected in 22 (9.6%) and 39 (19.3%) patients. By nested PCR and sequenced in both sense and antisense direction. EGFR (exons 18–21) and KRAS (exons 2 and 3) genes were amplified in 72 patients (182/48/52. EGFR (exons 18–21) and KRAS (exons 2 and 3) genes were amplified by nested PCR and sequenced in both sense and antisense direction. Kaplan-Meier estimates of overall survival (OS) and disease-free survival (DFS) were calculated for clinical and biological variables using Cox model.

Results: EGFR and KRAS mutations were detected in 22 (9.6%) and 39 (19.3%) patients, respectively. The most common KRAS mutations were G12C (42.0%), G12V (33.0%) and G12D (6.7%). Both EGFR and KRAS mutations were associated with adenocarcinomas (19/22, 86.4% P<0.000 and 24/39, 61.5% P<0.002, respectively). EGFR mutations in adenocarcinomas were more frequent in women (P=0.001) and in never-smokers (P=0.003). Furthermore, EGFR exon 19 deletions and 858R mutations were associated with better DFS (P=0.03). No differences in outcome were seen between patients harboring KRAS mutations.

Conclusions: The use of Tachosil® in lymphoedema after systematic mediastinal lymphadenectomy are presented.

P-024
THE USE OF TACHOSIL® IN LYMPHOSTASIS AFTER SYSTEMATIC MEDIASTINAL LYMHPHADENECTOMY IN LUNG CANCER PATIENTS
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Objectives: Results of prospective randomized study to assess applicability of Tachosil® on mediastinum after systematic lymphadenectomy on clinical outcome, except decreased amount of total postoperative drainage. It also showed a significantly higher concentration of IL-6 in pleural fluid on postoperative day 1 and 2, which may be the result of local immune response to Tachosil®, without any impact on postoperative complications.

Methods: In 29 patients from the Tachosil® group 1-3 large pieces of Tachosil® on mediastinum after systematic lymphadenectomy were presented.

Results: EGFR and KRAS mutations were detected in 22 (9.6%) and 39 (19.3%) patients. By nested PCR and sequenced in both sense and antisense direction. EGFR (exons 18–21) and KRAS (exons 2 and 3) genes were amplified in 72 patients (182/48/52. EGFR (exons 18–21) and KRAS (exons 2 and 3) genes were amplified by nested PCR and sequenced in both sense and antisense direction. Kaplan-Meier estimates of overall survival (OS) and disease-free survival (DFS) were calculated for clinical and biological variables using Cox model.

Results: EGFR and KRAS mutations were detected in 22 (9.6%) and 39 (19.3%) patients, respectively. The most common KRAS mutations were G12C (42.0%), G12V (33.0%) and G12D (6.7%). Both EGFR and KRAS mutations were associated with adenocarcinomas (19/22, 86.4% P<0.000 and 24/39, 61.5% P<0.002, respectively). EGFR mutations in adenocarcinomas were more frequent in women (P=0.001) and in never-smokers (P=0.003). Furthermore, EGFR exon 19 deletions and L858R mutations were associated with better DFS (P=0.03). No differences in outcome were seen between patients harboring KRAS mutations.

Conclusions: These findings suggest that EGFR and KRAS mutations are frequent in adenocarcinomas. KRAS is not a prognostic factor for survival. EGFR mutations could be used to identify patients suitable for adjuvant treatment with targeted therapy resulting in significantly improved outcomes.

P-025
STAGE I NON-SMALL CELL LUNG CANCER: THE PRESENCE OF LYMPHOCYTE-SPECIFIC PROTEIN TYROSIN KINASE IN THE TUMOR INFLTRATE IS ASSOCIATED WITH A BETTER LONG-TERM PROGNOSIS
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Objectives: The prognostic value of the presence of tumor-infiltrating immune cells in patients with lung cancer is controversial. For this reason, we studied the expression in the tumor infiltrate of a T-cell activation marker, the lymphocyte-specific protein tyrosin kinase (LCK), to assess if it could be associated with a better prognostic outcome in early stage non-small cell lung cancer (NSCLC) patients.

Methods: This retrospective study included 25 patients undergoing lobectomy with standard hilar mediastinal lymphadenectomy for pathological stage I NSCLC between July 2003 and June 2005. The presence of LCK was detected in the tumor infiltrate by immunohistochemistry on the specimen of all patients. No patient received adjuvant therapy.

Results: Resection was radical in all the patients. There was no postoperative mortality. Twelve patients resulted LCK-positive and 13 LCK-negative. The distribution of patients according to T-stage was similar between the LCK-positive group (6 T1, 6 T2) and the LCK-negative group (6 T1, 7 T2).
Median follow-up time was 56 months (range: 48-73). Median overall survival (OS) time was 61 months in the LCK-positive group and 30 months in the LCK-negative group (p < 0.01, Log-rank test). Overall survival was longer than 40 months in 72% (9/12) of the LCK-positive patients and in 30.7% (4/13) of the LCK-negative patients (p < 0.01, Fisher’s exact test). Median time to relapse (TTR) resulted significantly longer in LCK-positive patients than in LCK-negative patients (not reached vs. 25 months; p < 0.001, Log-rank test).

Conclusions: LCK-positive tumor-infiltrate is clearly associated with a longer OS and TTR in patients with radically resected stage I NGILC.

P-026
WHAT IS THE EFFECT OF THORACOTOMY ON CEREBRAL BLOOD VELOCITY?
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Objectives: The purpose of this study was to determine the impact of one lung ventilation (OLV) time and decubitus position on carotid artery flow dynamics in patients undergoing thoracotomy.

Methods: In our clinic, 30 patients are included in the study that we have operated between 2008 and 2009. Thirty patients undergoing thoracotomy were prospectively recruited and underwent preoperative. In the operation room, angle-corrected time averaged flow velocity, pulsatility index (PI), resistive index (RI) and flow volume were measured. Changing according to the duration of the operation in each patient 3-5 exams were performed which were one in the supine position, at least 15 min after the start of the general anesthe-sia. 2. In the lateral decubitus position after waiting for 15 min but before the OLV. 3. 15 min after the start of the OLV. 4. Each hour during the OLV.

Results: There was no significant difference between the flow velocities, PIs, RIs and flow volumes measured within the supine and decubitus positions and during one-lung ventilation. Also, there was no significant difference between flow parameters of upper and lower carotids measured in the lateral decubitus position before and after the one-lung ventilation. There was no association between any of the flow parameters and the duration of the one-lung ventilation.

Conclusions: Thoracotomy operations and one-lung ventilation does not create a negative impact on cranial blood flow. These operations are reliable in terms of blood flow in brain operations.

P-027
THIRTY-DAY MORTALITY AFTER RESECTION FOR LUNG CANCER – DATA FROM A NATIONAL DATABASE
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Objectives: Thirty-day mortality is one of the key indicators of quality in surgical outcome after resection for lung cancer. Data in the literature mostly reflect single institution experience. The Danish Lung Cancer Registry was established in 2000 and holds information on all patients who underwent surgery for lung cancer in Denmark. During the same period involved specialists audit all 30-day mortality annually.

Methods: Data from patients who were operated during the first 10-year period were analysed. Data completeness was established by cross-linkage with other national databases including pathology and the death-registry.

Results: Six thousand and six hundred and ninety-eight patients underwent surgery for lung cancer and 248 died before POD-30 (3.7%). During the 10-year period 30-day mortality rate declined from 4.9% to 2.5% per year. The median age of the 248 patients was 68 years (range 45-87) which did not differ from the main cohort. Thirty-day mortality was significantly lower in females (72 vs. 17% or 2.3% vs. 0%). Histology differed between sexes: adenoc–squamous- other types were 50%/21%/29% in females and 31%/43%/26% in the male group and squamous-cell subtype was a predictor for 30-day mortality in both groups. During the 10-year period pneumonectomy-rate declined from 20% to 7% and lobectomy-rate increased from 58% to 77%.

Conclusions: This study provides national data on 30-day mortality which is one of the key indicators of quality in surgical outcome. Thirty-day mortality rate declined after establishing a national registry with national guidelines. Changes in surgical strategies may also have aided to the reduction in 30-day mortality just as we believe that annual national audits may have played a role. Male gender and squamous-cell histology are predictors of 30-day mortality.

P-028
MOLECULAR DETECTION OF BACTERIA AND VIRUS IN DISTAL AIRWAYS OF PATIENTS UNDERGOING LUNG CANCER SURGERY
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Objectives: To assess with a molecular approach the incidence of airways colonization in patients submitted to lung cancer surgery.

Methods: A prospective study of all patients undergoing major lung resections for cancer was performed. Bronchial aspirations were obtained from broncho-alveolar lavage or lung biopsies from the resected lung specimen during surgery. Micro-organisms were detected using real-time PCR (polymerase chain reaction) assays targeting bacterial 16S rRNA gene, CMV and HSV. All postoperative events were recorded and compared to the results of the preoperative microbiological assessment.

Results: A total of 240 samples obtained from 87 successive patients were investigated by PCR. Sixteen were positive in 13 patients (15%) constituting the positive-PCR group. The remaining 74 patients constituted the negative-PCR group. Colonizing agents were exclusively CMV and HSV. All the 16S rRNA PCR remained negatives. Postoperative respiratory complications occurred in 18 (24%) patients of the negative-PCR group and nine (69%) in positive-PCR group (P = 0.003). Pneumonia occurred in six (8%) in negative-PCR group and in four (31%) in positive-PCR group (P = 0.039). On multivariate analysis, positive-PCR was the sole risk factor of postoperative respiratory complications (OR: 6.7, 95% CI: 1.3-33). Positive predictive value of positive-PCR in detection of postoperative respiratory complications was 0.70 (95% CI: 0.5-0.9).

Conclusions: When tested by molecular techniques, lung parenchyma and distal airways are free from bacteria but CMV was found in a high proportion. With a good positive predictive value, CMV-PCR should be seen as a reliable marker to identify patients at risk of postoperative respiratory complications.

P-029
PULMONARY METASTASECTOMY IN COLORECTAL CANCER: IMPROVING THE EVIDENCE BASE
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Objectives: The European Society of Thoracic Surgeons Working Group established that lung metastasectomy is commonly performed, there is wide variation in practice, there are no randomised trials, no control data, and that "the level of evidence to support current practice is too low to set firm recommendations to the members of ESTS". (JTO 2010 Supplement 2:120) Our objective is to improve the evidence base for practice.

Methods: The Thames Cancer Registry includes Dukes stage and the date of operation. Due to the variation in practice, there are no randomised trials, no control data, and we estimated survival amongst registry patients with similar characteristics.

Results: Survival rates predicted in the model (PSYS) for similarly selected patients were in each case higher than that observed (OSTS).

Conclusions: The assumption that few if any of the patients in highly selected series would have survived five years may not be correct. In the absence of control data, reported series cannot be relied upon as evidence for effectiveness of metastasectomy in prolonging life. We have therefore obtained National Cancer Research Institute support and Cancer Research UK funding for a prospective randomised trial called PuMiCC (Pulmonary Metastasectomy in Colorectal Cancer) which is now enrolling patients in the UK. Details can be found on the PuMiCC website: http://www.rhbt.mhs.uk/PuMiCC.
P-030
HOARINESS INCIDENCE AFTER MEDIASTINOSCOPY FOR LUNG CANCER STAGING: DOES VIDEO-ASSISTED MEDIASTINOSCOPY PROVIDE LOWER RATES OF HOARINESS COMPARED WITH STANDARD CERVICAL MEDIASTINOSCOPY?

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Objectives: The mediastinoscopy is performed with acceptable rates of morbidity in non-small cell lung cancer (NSCLC) staging. Traditionally, video-assisted mediastinoscopy (VAM) is defined as a method that provides a decrease in complications compared to standard cervical mediastinoscopy (SCM). We investigated whether the incidence of hoariness decreased in VAM compared with the rates reported after SCM.

Methods: Between 2006 and 2010, 448 patients with NSCLC underwent mediastinoscopy for staging, were retrospectively investigated. The number of the lymph node stations and nodes, the complications and false negativity were analyzed. The clinical record of each patient was examined and grouped as VAM (n=261) and SCM (n=187) according to surgical method. These groups were indifferent statistically with respect to age, gender, T staging and tumor localization.

Results: Although the mean number of nodal stations sampled were not of statistical significance between VAM (n=4.29±0.81) and SCM (n=4.14±0.84) (P=0.069), the number of sampled nodes were higher in VAM (n=7.91±1.97) compared to SCM (n=6.5±1.79) (P<0.001). Hoarseness was reported in 24 patients (5.4%). We observed a high incidence of hoariness in VAM (6.9%) with respect to SCM (3.2%) (P=0.087) and detected more in the left side tumors with a statistically significant difference according to the location of the primary tumor (P=0.038). Of the 309 patients (VAM=181, SCM=128) who were found to be pN0 after mediastinoscopy and underwent thoracotomy, mediastinal lymphadenectomy was performed which revealed a false negativity rate of 4.4% in VAM and 5.5% in SCM, respectively (P=0.67).

Conclusions: As VAM provides a higher rate of mediastinal lymph node station exploration and a higher rate of sampling, the complication rate owing to this procedure is also reported to be high. Despite rigorous attempts to preserve recurrent laryngeal nerve hoarseness is observed more after mediastinal exploration of left side lung tumors.

P-031
PROPHYLAXIS OF SUPPURATIVE AND INFLAMMATORY POSTOPERATIVE COMPLICATIONS IN LUNG CANCER PATIENTS USING ANTIOXIDANT AND IMMUNOMODULATING DRUGS

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Objectives: Homeostasis in cancer patients is characterized with disorders in natural resistance system, which are pathogenic factors for the development of postoperative complications. The aim of the study was to reduce the postoperative supplicative and inflammatory complications in lung cancer patients through perioperative supportive therapy with antioxidant and immunomodulating drugs.

Methods: Antioxidant preparations, laptrot (LP, human milk lactoferrin) and ceruloplasmin (CP, human blood ceruloplasmin), and immunomodulators, imunophan (IMA, a synthetic hexapeptide) and galavit (GL, a phthaldehydride derivative) were used. Lung cancer patients undergoing surgery (n=148) were randomized into groups according to their clinical status, perioperative therapy, and surgical treatment; control group (n=47) without supportive therapy, and four groups treated with various combinations of antioxidant and immunomodulating drugs, "CP+GL" (n=24), "LP+IM" (n=31), "LP+GL" (n=28), and "CP+IM" (n=18). The number and severity of complications were registered. Examination of laboratory indices of peripheral blood cells, immune and anti-immunocyte status were performed before and after the pre- and postoperative supportive therapy.

Results: Leukocytosis or leukopenia, especially in combination with immunosuppression, before surgical treatment indicate high-risk of developing postoperative complications and may serve as the criteria for administration of antioxidant and immunomodulating drugs. Supplicative and inflammatory complications were detected in 12.8% of patients from the control group, and 83.3% of them were severe (pleura empyema and pneumonia). In "LP+IM" group, complications were detected in 9.7% of patients, but only 33.3% of them were severe (pneumonia). No complications were observed in "CP+IM" group.

Conclusions: Perioperative supportive therapy, especially one that includes Imunophan in combination with ceruloplasmin or laptrot, reduces the number and severity of supplicative and inflammatory postoperative complications.

P-032
A COMPARATIVE COST ANALYSIS STUDY OF LOBECTOMY PERFORMED VIA VIDEO-ASSISTED THORACIC SURGERY AND THORACOTOMY

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Objectives: The cost analyses studies which were performed in Western countries report that the over-all costs of lobectomies performed via video-assisted thoracic surgery is similar or even less than that performed via thoracotomy approach. The situation may be different in a developing country.

Methods: We retrospectively reviewed the hospital records of 81 patients who underwent lobectomy between September 2007 and March 2009 either via video-assisted thoracic surgery approach (video-assisted thoracic surgery group, n=32) or via thoracotomy (thoracotomy group, n=49). Patient characteristics, pathology, perioperative complications, additional surgical procedures, length of hospital and intensive care unit stay, outcomes of both groups were recorded. Detailed cost data for medications, anesthesia, laboratory, surgical instruments, disposable instruments and surgery cost itself were also documented. Statistical analyses were done to compare the groups.

Results: The two groups were homogeneous in regard to age, sex, pathology and perioperative morbidity. The mean duration of hospitalization in the video-assisted thoracic surgery group was significantly shorter than that of the thoracotomy group (7.78±5.11 days vs. 10.65±5.78 days, P<0.05). Although there were no statistically significant differences in the charges for medications, laboratory examinations, anesthesia and the surgical fees between the two groups, overall mean final cost in video-assisted thoracic surgery group was significantly greater than that of thoracotomy group ($)3970±1873 vs. $3083±1013, P=0.002). This significant difference relies mostly (or totally) on the cost of surgical disposable instruments which were used much more in video-assisted thoracic surgery group than thoracotomy group ($2252±1856 vs. $427±47, P<0.05).

Conclusions: In contrast to Western countries, in a developing country a video-assisted thoracic surgery lobectomy may have a greater cost than a lobectomy via thoracotomy. The relatively more expensive disposable surgical instruments and relatively cheaper hospital charges leads final over-all cost to be greater in video-assisted thoracic surgery lobectomy patients.

P-033
PREDICTING RISK OF INTENSIVE CARE UNIT ADMISSION AFTER RESECTION FOR NON-SMALL CELL LUNG CANCER: A VALIDATION STUDY

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Objectives: A simple model has reported good discriminating ability to predict the risk of intensive care unit (ICU) admission after lung resection, and advocated for patient management and benchmarking centre performance. However, it has not been validated outside of the derivation cohort. The aim of our study was to validate the predictive model at our institution.

Methods: We conducted a retrospective review of a series of consecutive patients who underwent major lung resections at our institution over a six-year period. Test performance was evaluated by area under the receiver operator characteristic (ROC) curve.

Results: Between January 2003 and July 2008, 425 patients underwent major lung resections for primary lung cancer. The mean age (S.D.) of the cohort was 65 (10) years and 241 (57%) were men. A total of 77 (18%) patients were admitted to ICU, 47 for elective admission and 30 (7%) for treatment of post-procedure complications. Of the 30 patients admitted for treatment (post-operative complications), the median time to ICU admission (interquartile range) was the postoperative day 2 (1-4 days); and the median length of ICU (interquartile range) stay was 3 days (1-15 days). The mortality rate among ICU admissions for complications was 1%. The area under the ROC curve for our cohort of patients was 0.66 (95% CI 0.53-0.79), indicating moderate discriminating ability.
Conclusions: The Brunelli scoring system had only moderate discriminating ability to predict the risk of ICU admission; admission to ICU for postoperative complications carries a high risk of death.

P-034

ARM AND SHOULDER FUNCTION AND QUALITY OF LIFE AFTER TRIMODALITY TREATMENT FOR PANCOAST TUMOURS: DOES THE SIDE MATTER?

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Objective: Patients with Pancoast tumours may complain of pain or neurological deficit in the ipsilateral arm or shoulder. Also treatment with chemoradiotherapy and surgery may affect the function of arm or shoulder, reducing the quality of life (QOL). This study was done to evaluate and arm and shoulder function and QOL of patients treated for Pancoast tumours by concurrent chemoradiotherapy and surgery.

Methods: The arm and shoulder function and QOL was evaluated in patients in whom a Pancoast tumour was resected after induction chemoradiotherapy at our centre between 2002 and 2010. The following tests were used: DASH (disability of arm and shoulder) questionnaire, ARA (action research arm) test, nine-hole peg (NHP) test, ROM (range of motion) test and SF-36 questionnaire.

Results: The study period 66 patients were operated [median neoadjuvant radiotherapy dose 50 Gy (range 39–66 GY)]. The number of surviving patients when this study was done in 2010 was found to be 20, of whom [11 mean age 55 years, mean follow-up 42 months (range 9–101 months)] could be evaluated with all tests: eight had had the tumour on their dominant side and three on the non-dominant side. The ARA test, NHP test and ROM did not differ between the two groups. However, the DASH score and SF-36 indicated less disabilities in daily life and a better QOL for the domains pain, vitality and emotional in patients treated for a Pancoast tumour on their dominant side.

Conclusions: This study suggests that patients with a Pancoast tumour on their dominant side end up with less disabilities and a better QOL after trimodality treatment.

P-035

PROGNOSTIC SIGNIFICANCE OF THE PRESENCE OF CARCINOMA IN SITU ADJACENT TO STAGE I TO IIIA RESECTED LUNG CANCER

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Objective: To evaluate the prevalence and prognostic significance of the presence of carcinoma in situ (CIS) in stage I to IIIA resected non-small cell lung cancer (NSCLC).

Methods: A retrospective study was conducted upon 1490 patients resected for stage I to IIIA NSCLC from 1979 to 2004. Univariate and multivariate analyses were conducted.

Results: There were 74 segmentectomies (4.9%), 1080 lobectomies (71.95%) and 347 pneumonectomies (23.11%). One hundred and forty-six patients (9.72%) had bronchial wedge or sleeve lobectomy. Resection was complete in 1332 (90.73%), microscopically incomplete (R1) in 113 (7.58%) and macroscopically incomplete (R2) in 36 (2.41%). There were 267 stage I A, 350 IB, 94 IIA, 393 IIB and 386 IIIA. One hundred and twenty-six CIS (8.45%) were found in the vicinity of the resected lung cancer (distant and/or at the bronchial margin). There was no statistical differences between CIS and control group. Overall operative mortality rate was 7.59%. Overall survival rate was 35.9% at five years (65.6% to 23.2%). The presence of CIS was not correlated to survival either in univariate nor multivariate analysis. However, after uni- and multivariate analysis, age, some comorbidities, the side of the tumor, tumor stage, type of resection and bronchial margin positivity were predictive of survival.

Conclusions: Long-term survival of patients resected for stage I to IIIA NSCLC is adversely affected by factors related to the patients health status, to the tumor and to the treatment but not by the presence of CIS in the vicinity of the resected tumor.

P-036

ACUTE PHASE RESPONSE AND CLINICAL OUTCOME AFTER LOBECTOMY: TRIMODALITY TREATMENT FOR PANCOAST TUMOURS VS. ANTERO-LATERAL MUSCLE-SPARING THORACOTOMY

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Objective: Many studies confirmed that video-assisted thoracoscopic surgery (VATS) approach is less invasive than conventional posterolateral thoracotomy including its immunological effect. In this prospective study we compare the clinical data and acute phase responses after VATS or open lobectomy performed by less invasive anterolateral muscle-sparing thoracotomy.

Methods: From 2009 to 2010, 139 consecutive patients were included in this study. Seventy-four patients (48 males and 26 females) underwent thoracoscopic lobectomy (VATS group) and 59 (40 males and 19 females) were operated on by anterolateral muscle-sparing thoracotomy (thoracotomy group). There was no difference between these groups regarding: age, gender, tumor size, preoperative lung function and comorbidity. Outcome variables analyzed included: length of hospitalization, chest tube duration, blood loss, 30-day mortality, morbidity and length of surgery. White blood cells count and following acute phase proteins were analyzed: C-reactive protein (CRP), haptoglobin (HAP), α-1 acid glycoprotein (AGP), α-1-antitrypsin (AAT) at 6, 24, 72 and 144 h postoperatively.

Results: There was no difference between VATS and thoracotomy group in terms of 30-day mortality. In the VATS group length of hospitalization (mean 7.6 days ± 3.4 vs. 9.8 days ± 4.8), chest tube duration (mean 4.0 days ± 2.1 vs. 5.5 days ± 2.5) and length of surgery (mean 117 min ± 29 vs. 133 min ± 35) were shorter than after thoracotomy. Blood loss (mean 89 ml ± 25 vs. 265 ml ± 109) and morbidity rate (21.6% vs. 45.8%) were lower in the VATS group. The increase of leucocytes and acute phase proteins was observed in both groups but were higher in the thoracotomy group. Significant differences were reached for AGP, AAT and HAP at 72 h and 144 h, for CRP at 24 h and 72 h and for leucocytes at 24 h and 144 h.

Conclusions: VATS lobectomy is associated with more favorable postoperative clinical outcome and reduced perioperative acute phase responses compared to antero-lateral thoracotomy lobectomy.

P-037

SLEEVE RESECTIONS WITH UNPROTECTED BRONCHIAL ANASTOMOSES ARE SAFE EVEN AFTER NEOADJUVANT THERAPY

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Objective: Sleeve resection is the operation of choice in patients with centrally located tumors, in order to avoid a pneumonectomy. Most surgeons protect the bronchial anastomoses with tissue to prevent insufficiencies. The purpose of this study is to report on outcome of unWrapped bronchial anastomoses, especially after neoadjuvant chemo- or chemoradiotherapy.

Methods: From 2000 and 2010, 103 patients [58 years±1.3 (range 16-80 years) 40 females] underwent bronchial sleeve resections without coverage the anastomosis with a tissue flap. We retrospectively reviewed the data for morbidity, mortality and survival in regard to type of resection, neoadjuvant therapy and stage.

Results: Sleeve lobectomy was performed in 88, sleeve-bilobectomy in eight, sleeve-pneumonectomy in four and sleeve resection of the main bronchus in three patients. Twenty-seven patients had a combined vascular sleeve-resection. Neoadjuvant chemotherapy was performed in 25 and radio-chemotherapy in five patients. Non-small-cell lung cancer (NSCLC) was present in 76 (squamous cell carcinoma in 44, adenocarcinoma in 24, large cell carcinoma in six, mixed cell in two) and neuroendocrine tumor in 20 and other histological types in seven patients. The pathologic tumor stage in NSCLC was stage I in 26, stage II in 26, stage IIIA in 16, stage IIIB in seven, and stage IV in one patient. There were no anastomotic complications especially no fistulas. Twenty-four patients had early postoperative complications, including 11 surgery-related complications (air-leakage, nerve injury, hemothorax or mediastinal emphysema). The 30-day mortality was 2.9% (one patient died due to heart failure and two with multigorgan failure). The five-year survival rate was 63% in NSCLC patients, and 86% in neuroendocrine tumor patients.

Conclusions: Sleeve resection without wrapping the bronchial anastomoses with a tissue flap is safe even in patient who underwent neoadjuvant chemo- or chemoradiotherapy. Therefore, wrapping of the bronchial anastomoses is not routinely mandatory.
P-038
SURGICAL TREATMENT OF 549 PATIENTS WITH LUNG METASTASES OF COLORECTAL ORIGIN: A PROSPECTIVE MULTICENTER SPANISH STUDY (GECMP-CCR-SEPAR)
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Objectives: A prospective multicenter study for the clinical diagnostic factors implicated in the surgical treatment of lung metastases of colorectal origin.

Methods: From March 2008 to February 2010, 32 hospitals prospectively collected data on all patients with lung metastases of colorectal origin, surgically treated with curative intention.

Results: Five hundred and forty-nine patients were included, 352 males (65.4%) and 197 females (34.6%), 32-88 years old (mean 64.5 years). The number of nodules: 1-12 (mean 1.88), bilateral in 120 patients (22.8%). Surgical approach: unilateral (UNI) in 446 (85%) and bilateral (BIL) in 81 (15%), 23.7% in the same surgical session. Six hundred and nine total surgical resections: 488 (80.1%) wedge, 19 (3.1%), segmentectomy, 98 (16.1%) lobectomy and 4 (0.7%) pneumonectomy. Number of lung metastases removed: 1-25 (mean 1.8). Nodules detected by CT/confirmed histologically: Same in 76.6% of patients (79.4% if UNI and 60.3% if BIL, P<0.001), less in 9.3% (7% UNI, 20.1% BIL P=0.001) and more in 14.1% (13.5% UNI 16.7% BIL). PET sensitivity was 84% (64% if <1 cm; 93% if >1 cm) and specificity 76% (83% if <1 cm; 50% if >1 cm). Systematic lymph node dissection (SLND) was performed in 51 patients (20.4%), sampling in 96 (38.4%) and less than that in 103 (41.2%). Lymph node removed: 1-41 (mean 5.5). N status: 77.7% N0; 2.4% N1; 7.7% N2 and 12.1% Nx. Morbidity in 81 patients (15.4%): air leak in 17 (3.2%), atelectasis in 14 (2.6%) and pneumonia in 12 (2.2%). Postoperative mortality in two patients (0.4%) because of ventricular fibrillation and sepsis.

Conclusions: Wedge resection is the most used technique. When multiple and bilateral nodules, simultaneous resection is an option. There was a significant difference between the number of nodules detected by CT and confirmed histologically when unilateral vs. bilateral, SLND or sampling are not performed routinely. Morbidity and mortality are low.

P-039
ASSOCIATION BETWEEN LYMPH NODE STATION AND RECURRENCE IN NSCLC TREATED WITH SURGERY
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Objectives: To describe survival, incidence and localization of recurrence in NSCLC patients treated with surgery and single pN1 disease, multiple pN1 and single unsuspected pN2.

Methods: Between 2005 and 2009, we treated 378 lung cancer patients with surgery with radical intent, 151 cases were pN1 or pN2. Of this, we excluded patients with neoadjuvant treatment, incomplete resection, incomplete lymph node dissection, metastasis, CN2 disease, multiple pN2, SCLC and lack of PET-TC. All patients were staged with TNM classification 2010. The sample was 72 patients: 21 single pN1, 26 multiple pN1 and 25 single unsuspected pN2. The statistical analysis included descriptive statistics, χ², Kaplan-Meier and Log Rank test.

Results: There were 62 men (86%) and 10 women (14%), mean age 64±9 years. The most frequent histological type was squamous carcinoma (49%). The three subgroups were homogeneous in age, comorbidities, cTNM, pT and type of resection (P>0.05). Adjuvant treatment was performed in 55 patients (76%). The four-year survival of single pN1 was 77%, multiple pN1 36% and single unsuspected pN2 53% (P=0.32). The mean survival of single pN1 was 52±5 months, multiple pN1 42±5 months and single pN2 29±4 months. Single pN1 presents 5 patients with recurrence (24%): local recurrence in 4 and metastasis in 2. Multiple pN1 presents 14 patients with recurrence (54%): local recurrence in 8 and metastasis in 8. Single unsuspected pN2 presents 8 patients with recurrence (32%): local recurrence in 1 and metastasis in 8. The incidence of local recurrence was higher in patients with pN1 disease (P<0.03), whereas the incidence of metastasis was higher in multiple pN1 or single pN2 (P=0.07).

Conclusions: The survival of patients with single unsuspected pN2 is similar to patients with multiple pN1. Patients with pN1 disease present more local recurrence, while patients with multiple pN1 or single unsuspected pN2 present more metastasis.

P-040
MAXIMUM STANDARDIZED UPTAKE VALUE (SUVmax) OF FLUORODEoxyGLUCOSE POSTION EMISSION TOMOGRAphY (FDG-PET) OF PRIMARY TUMOR IS A GOOD PREDICTOR FOR PATHOLOGICAL NODAL INVOLVEMENT IN CLINICAL N0 NON-CELL LUNG CANCER (NSCLC)
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Objectives: FDG-PET plays an important role in evaluating resectable NSCLC. However, histological nodal involvement cannot be detected with this modality, resulting in stage migration for resectable lung cancer. In this study, we tried to evaluate the possibility to predict histological nodal involvement in patients with NSCLC using SUVmax of FDG-PET of the primary tumor instead of that of lymph nodes themselves.

Methods: Between February 2008 and January 2011, 695 patients underwent lung cancer surgery at our Institute. Among them, we retrospectively analyzed 196 patients with clinical N0 NSCLC patients, who underwent preoperative FDG-PET. Relationship between clinicopathological features including the findings of FDG-PET and pathological nodal involvement were investigated. Investigated factors were as follows: age, gender, preoperative carcinoembryonic antigen titer, maximum tumor dimension, SUVmax in the primary tumor.

Results: Of 196 clinical N0 NSCLC patients, 155 (79.1%) had pathological N0 status and 41 (20.9%) had hilar and/or mediastinal pathological lymph node involvement. Among 48 patients with NSCLC showing 10 or more SUVmax of FDG-PET, 18 (43.9%) patients had nodal disease, while 23 (19.4%) had nodal disease of 148 patients with <10 SUVmax of FDG-PET (P=0.002). On multivariate analysis, SUVmax of primary tumor was only significant predictor for pathological nodal disease (risk ratio: 3.130, 95% CI: 1.588-6.986, P-value: 0.015).

Conclusions: Postoperative nodal status was significantly predicted with SUVmax of FDG-PET of the primary tumor instead of lymph nodes themselves. Patients with NSCLC showing 10 or more SUVmax could have occult nodal metastases, and may be indicated further preoperative modality for accurate staging.
section rates were generally low. Potential reasons for the low SLND rate include trusting the PET stage, practising selective lymph node and sweeping mediastinal nodes into the main specimen.

P-042 PNEUMOCENTSY AFTER INDUCTION TREATMENT: IS IT JUSTIFIED?
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Objectives: Pneumocentosy (PN) is a controversial type of resection partic-
ularly after induction treatment in the management of NSCLC. Our aim was
to present the results of pneumocentosy performed after induction treat-
ment and compare the results to the patients without induction treatment.
Methods: All pneumocentosy performed for NSCLC between January 1997
and January 2011 were retrospectively reviewed. One hundred and seven-
teen pneumocentosy were performed in the period and 42 (36%), Group 1,
were performed after induction therapy (chemotherapy or chemoradiation)
whereas 75 (64%) patients, Group 2, had no treatment before surgery. All
results were compared between the groups.
Results: All but four patients were male with a mean age of 57 (range 34-82).
There were 16 (38%) right and 26 (62%) left PN in Group 1, 37 (49%) right and
38 (51%) left in Group 2. P<0.05. Major morbidity was observed in 24% of the
patients in Group 1, whereas 37% in Group 2, P<0.05. Although mortality was
not observed in Group 1, there were three patients (4%) died in the postoperative period
in Group 2. P>0.05. Bronchial stumps was closed with staplers in all but 13 patients.
Overall BPF rate was 3.5% (4/114 patients), two patients in each group.
Conclusions: The results of our experience suggest that cannabis abuse can
present prolonged air-leaks after bullectomy. Furthermore, cocaine, when
smoked together with marijuana, seems to aggravate marijuana-induced lung injury.

P-043 CANNABIS ABUSE AND SPONTANEOUS PNEUMOTHORAX: A RETROSPECTIVE
STUDY
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Objectives: The link between cannabis abuse and spontaneous pneumotho-
orax is still unclear, due to the lack of reports in literature. However, the
number of marijuana-smoking young adults presenting with spontaneous
pneumothorax is continuously increasing. This is a retrospective analysis of
young cannabis-smoking patients admitted to our hospital with spontaneous
pneumothorax.
Methods: In the last six years, 11 young cannabis smokers were evaluated.
Clinical history, chest imaging studies, perioperative and postoperative data
were assessed and the findings of this group (group A) were compared with
those of 61 young non-cannabis smokers presented with primary spontaneous
pneumothorax in the same period (group B).
Results: The median age was 29 years (range 22-38) in group A and 24 years
(range 17-42) in group B. All patients in group A had a tobacco smoking his-
tory and 3 also were cocaine consumers, while 42 group-B patients (69%)
were tobacco smokers. CT-scan showed multiple emphysematous bullae
(size: 3.2-7.0 cm) in all the group A patients; the three cocaine consum-
ers showed larger bullae with pleural thickening (size: 5.1-12.0 cm). Only
33 group-B patients (54%) showed small apical blebs (size: 0.5-2.0 cm). All
the group-A patients were treated by VATS for prevention of recurrent
pneumothorax. Forty-three group-B patients (65%) underwent VATS. Mean
postoperative drainage stay was longer in group A (6.6 vs. 2.8 days; P<0.05).
The three group-B cocaine consumers showed a worse postoperative course
(mean drainage stay: 7.8 days).
Conclusions: The results of our experience suggest that cannabis abuse can
play an important role in the early development of bullous emphysema. Our
Cannabis-smoking patients with spontaneous pneumothorax showed large
bullae similar to those seen in elderly patients with bullous emphysema and
presented prolonged air-leaks after bullectomy. Furthermore, cocaine, when
smoked together with marijuana, seems to aggravate marijuana-induced lung injury.
Methods: We retrospectively reviewed 104 patients with PNp undergoing VATS in two different hospitals between January 2007 and December 2008. Patients underwent apical lung resection or bullectomy and pleurodesis, being distributed in two different groups depending in the type of pleurodesis [mechanical pleural abrasion (MPA) at Hospital A, and talc pleurodesis (TP) at hospital B]. The follow-up was until December 2010. Variables analyzed were: recurrence, complications, mortality, days of air leak, days of chest tube drainage and postoperative stay.

Results: We performed 106 interventions in 104 patients (89 males, 15 females, mean age 28 years). Right PNp was identified in 64 patients (60.38%) and 68 (64.15%) smoked before the first episode of NTX. Surgery was offered when second episode of ipsilateral PSP occurs (46.26%), in contralateral PSP (14.15%), and PSP with persistent air leak (26.42%). Median follow-up was 38 months. No mortality was related in neither group, and 4 patients (3.77%) presented a recurrence of PSP after surgery. Median air leak was 0.78 days, median chest tube drainage was 1.95 days and median hospital stay was 2.68 days. MPA (group A) was carried out in 74 patients (69.81%) and TP (group B) in 32 (30.19%). Both groups were homogeneous: age 26.73 (group A) vs. 31.12 years (P=0.083); male 67.41% (group A) vs. 82.35% (P=0.219), right PNp 54.05% (group A) vs. 75.00% (P=0.053), and pre-PSp smoking rate 62.13% (group A) vs. 68.75% (P=0.516). Results were not significantly different between the MPA and TP group in recurrence [4.05% vs. 3.13% (P=0.810)], complications [6.76% vs. 12.5% (P=0.448)] or mortality (0%). However, median hospital stay was lower in MPA than TP (2.22 vs. 3.75 days, P=0.005).

Conclusions: VATS is a safe procedure for the management of PNp. In combination with apical lung resection or bullectomy, results of MPA do not significantly differ from TP, but patients undergoing MPA suffered half of complications and a significant lower hospital stay. Considering these results, we should recommend a multicenter clinical trial comparing both techniques to determine which one is preferable to provide a higher level of scientific evidence in an area yet to be defined.

P-047
SURGICAL TREATMENT OF SPONTANEOUS PNEUMOTHORAX OCCURRING ON A SINGLE LUNG (FUNCTIONAL OR AFTER PNEUMONECTOMY): ABOUT 14 CASES
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Objectives: To assess the results of surgical treatment of spontaneous pneumothorax occurring on a single lung (functionally or after pneumonectomy).

Methods: From 1985 to 2007, 14 patients (13 males, mean age: 61.3 years) were operated on for a pneumothorax occurring on a single lung. In group 1 (8 patients), the pneumothorax occurred after a mean period of 22 months (0-57 months) after pneumonectomy for cancer treatment (2 cases), trauma (6). In group 2 (6 patients) the contralateral lung to the pneumothorax was evaluated as non-functional: lobectomy for cancer followed by radiotherapy (3 cases), destroyed lungs by benign disease (2 cases), lobectomy for bronchiectasis (1 case). In all operation was scheduled from the first episode (due to the general condition of the patient or low tolerance) and was performed within a mean delay of 10.9 days. Symphysis was performed under general anesthesia, for 3 patients by isolated talcage by pleuroscopy and for 11 others by auxiliary thoracotomy: six apical bullectomies, nine subtotal pleurectomies associated with four talcages and two isolated mechanical abrasions. Five patients (group 2) had a double lumen tracheal tube.

Results: Two patients had a tracheostomy, one of which permanent. Five patients died in the postoperative period (50 days), from multivisceral failure (3), pneumonia (1) and bronchial cancer recurrence (1). One patient had a medically treated pneumothorax relapse. The mean survival period is 53.3 months. Seven patients died after 4, 27, 30, 48, 72, 84 and 108 months. Two patients are still alive (47 and 148 months). There is no difference between the groups.

Conclusions: Surgical treatment of pneumothorax occurring on a single lung is effective, despite a high morbidity-mortality rate. Sporadic cases have been published, some of which were operated with ECMO.

P-048
PROLONGED AIR LEAK AFTER LUNG RESECTION. DOES INTRAJPULMONARY PRESSURE MATTER?
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Objectives: Digital drainage systems can measure intrapleural pressures data, which are usually considered not relevant. The study hypothesis was that these data may be informative and that intrapleural pressure may be related with postoperative air leak after lung resection.

Methods: The study was designed to prospectively enroll 100 patients undergoing pulmonary resection. Postoperative air leaks were monitored by the use of a digital chest drainage system (DigiVent, Millcote AB, Sweden). Drains were removed when no air leak was recorded for more than 24 h. Maximum, minimum intrapleural pressures and air leak flow during the first 72 postoperative hours were compared between patients who had their drains removed within PODs (group A), those in which they were removed between POD6 and POD15 (group B) and those who had drains removed later (group C).

Results: Study enrollment was stopped after 90 cases as the digital device became unavailable. Patients distribution was: group A 51 cases (56.6%), group B 17 cases (18.8%) and group C 22 cases (24.4%). Median air leak was significantly lower in group A after the first 24 h (P=0.03), meanwhile no difference was recorded between group B and group C. Maximal intrapleural pressure curves had a different pattern in each subgroup: minimal shifts and continuous negative values in group A, large shifts and almost continuous negative values in group B, large shifts and more positive values in group C (P=0.04). No difference between groups was detected in terms of minimal intrapleural pressures.

Conclusions: Intrapleural maximal pressures and air leak flows are related and their interaction changes according to the duration of postoperative air leak. This information opens interesting perspectives on the potential predictive value of maximal intrapleural pressure in early definition of patients who will need chest drain for a long period of time.

P-049
BUILDING A PULMONARY THROMBOEMBOLIC DISEASE PROGRAM IN TURKEY: PRELIMINARY RESULTS
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Objectives: Pulmonary endarterectomy (PEA) is the treatment of choice for Chronic Thromboemolic Pulmonary Hypertension (CTEPH) patients who are considered operable by an experienced surgeon and interdisciplinary teams. For the first time, a PEA program is being established in Turkey and in this study, we review our short-term results of patients undergoing PEA.

Methods: In the period of September 2009-January 2011, 26 patients underwent PEA. The clinical data were collected prospectively. Diagnosis was confirmed by right heart catheterisation, ventilation-perfusion scintigraphy, CT and/or pulmonary angiography.

Results: Twenty-six patients (20 male; mean age: 48.5±15.8 years) underwent PEA. Median time from CTEPH diagnosis to surgery was 25 months (1-48). Prior to surgery all patients were in NYHA functional class III or IV, 6-min Walk Test of 218±144 meters, mean pulmonary ateral pressure (mPAP) of 31.4±12.2 mmHg in right heart catheterisation and a mean pulmonary vascular resistance (mPVR) of 9.4±4.4 wood. Bilateral PTE was performed sequentially under total circulatory arrest with intraoperative cardiopulmonary bypass and deep hypothermia (18C). Nitric oxide (NO) was used after the end of circulatory arrest and inhaled iloprost was used after extubation. In-hospital mortality was 15% (4/26) with an uncontrollable intraoperative massive hemopthysis and heart failure (n=1), sepsis on postoperative 22nd day (n=1), heart failure following a massive bleeding from the left pulmonary artery (n=1) and a sudden reperfusion lung edema on the first postoperative day (n=1). Morbidity was seen in four patients (17.3%). Mean intubation time was two days, mean time in intensive care unit was 17 days and mean hospital stay after surgery was 11 days. SPP decreased from 9.0±24.6 to 42±16.2 mmHg (P=0.001) after PEA. Median follow-up of discharged 22 patients was 155 days and all of them are NYHA class I or II.

Conclusions: Management of CTEPH patients in specialized centers suggest high quality care as indicated by low operative mortality and good early results. Future follow-up data will support critical decision-making regarding operability and treatment options for these patients.
P-050
SURGICAL TREATMENT OF NECROTIZING PNEUMONIA AND LUNG GANGRENE
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Objectives: Necrotizing pneumonia, pulmonary abscess and lung gangrene are rare complications of severe pulmonary infection with devitalization and sloughing of lung tissue. Pulmonary necrosis is often associated with alcoholism and other chronic disorders with known immunodeficiency. Mortality is significant and both treatment strategies as well as the role of surgery are controversially debated.

Methods: In a retrospective review at a German tertiary referral hospital 17 patients with pulmonary resection for necrotizing lung disorders were identified since 2008. All procedures were performed by the same thoracic surgeon (MS). At hospital admission all patients suffered from pulmonary sepsis and despite adequate medical treatment progressing parenchymal destruction and devitalization took place. The majority of the patients developed pleural effusions (11/17) and four patients a persisting air leak. On account of failing medical therapy six patients (35%) developed severe sepsis with septic shock and four patients (24%) were already preoperatively ventilated. Chronic alcoholism was present in 8 patients (47%).

Results: Gangrene of a complete lung was seen in four cases. Lobar gangrene or necrotizing pneumonia complicated by fulminant abscess was seen in the right lower lobe (7/17), middle lobe (4/17) and right upper lobe (2/17). Procedures included pneumectomy (4/17), lobectomy (11/17) and limited resection (2/17). The bronchial stump was reinforced with a pedicle muscle flap in seven cases. There were three postoperative deaths due to septic shock with multi-organ-failure. The remaining 14 patients (82%) recovered well and were transferred to rehabilitation clinics specialized on pulmonary disorders.

Conclusions: Necrotizing pulmonary infections are infrequent but life-threatening disease entities. Patients often present with severe comorbidity and chronic disorders causing immunodeficiency. If initial medical therapy fails surgery offers a reasonable therapeutic approach. Aim of surgical therapy is resection of all gangrenous lung parenchyma and effective drainage of pleural effusions. Then recovery is feasible in up to 80%.

P-051
THORACOSCOPIC BULLECTOMY FOR DYSPNOEA IN EMPHYSEMA: DEFINING NEW BOUNDARIES
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Objectives: There exists only limited guidance on patient selection for giant bulllectomy in emphysema which is now 20 years old. Mortality was reported as 10%, and patients with FEV1 <50% predicted were excluded. Our modern experience with lung volume reduction surgery has reduced our selection threshold. Thus, we reviewed our results and their implications for patient selection.

Methods: Between June 1997 and November 2009, 55 patients [45 male;10 female; median age 61 years (range 39-76 years)] with significant dyspnoea associated with giant emphysematous bullae underwent surgery. Their median preoperative FEV1 was 31% predicted (range 9-93%). Twenty nine patients had FEV1<50% predicted and fifteen <25% predicted. Eight patients (6%) required postoperative ventilation. Thirty-day mortality was only 3.6% (2 patients). One year survival was 94.5% (52 patients). Symptomatic improvement in dyspnoea was reported in 73% patients. Median follow-up of our patients was six years (range 1-13 years). In a subgroup study of the 15 most recent patients there was an improvement in postoperative FEV1 in 14, with a median improvement of 15.2% at one year after the operation (range 1-41%).

Conclusions: The selection of patients for VATS giant bulllectomy for symptomatic relief should be extended to those with severe airflow obstruction and borderline respiratory failure.

P-052
DIFFERENCES IN CLINICAL PRESENTATION, SURGICAL APPROACH AND RESECTION TYPES IN BRONCHIECTASIS: A MULTICENTER STUDY
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Objectives: Despite the declining prevalence, surgical resection is the treatment of choice in patients with symptomatic bronchectasis. It remains controversial as to which subgroups of patients would benefit from which surgical management. We aimed to investigate the variations in surgical approach, surgical indications and predictors of successful surgery in bronchectasis patients in a multi-institutional setting.

Methods: One hundred and seventy consecutive patients (81 men, 89 women) who were operated on for bronchectasis between January 1998 and August 2010 in four thoracic surgery departments were analyzed retrospectively. Mean age was 30.6 years. The disease was bilateral in 6 patients. Eight patients had pulmonary tuberculosis. A posterolateral or anterior thoracotomy was performed in 155 patients (91%), whereas 15 patients (9%) had videothoracoscopic lobectomy. Follow-up data were obtained in 134 patients.

Results: Complete resection was achieved in 161 patients (94.7%). There was five operative mortality (2.9%). Forty-three patients (25.3%) developed at least one complication. Postoperatively the patients were asymptomatic in 94.7% of patients, improved in 2.4%. An immunological pathology was notified in five patients (2.9%). Univariate analysis disclosed that, videothoracoscopic lobectomy was associated with fewer complications (P=0.044), shorter hospital stay (P=0.035) and less total chest tube drainage (P=0.001). Older age was not associated with higher morbidity. Pneumonectomy was performed in only one institution. An institution was found to be associated with left-sided resections (P=0.01). Logistic regression extracted the videothoracoscopic resection for complication free surgical procedure with statistical significance (P=0.04).

Conclusions: Despite decreasing prevalence, indications and resection types greatly vary among institutions. Videothoracoscopic resection can be performed safely and is associated with fewer complications, shorter hospital stay.

P-053
ANTEROIR FLAY CHEST AND NUSS TECHNIQUE
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Objectives: Chest trauma associated with a flail chest in 5-15% of cases. Shunters are an independent factor of gravity. Their support is little or no systematic. The objective of this study is to describe an original technique of stabilisation of flail chest.

Methods: Retrospective study from March 2001 to March 2010 on four patients who received anterior flap surgical stabilization by the Nuss technique on a series of 44 patients with flail chest caused by trauma hospitalised service resuscitation. A bilateral thoracotomy was performed, drainage and removal of two cavities and implementation of the retrosternal bar.

Results: For each it was an unstable component associated with a wide sternal fracture with indication for fixation was raised in a failure of respiratory weaning (eight days to one month). The duration of response was brief (75-90 min). Three of these patients showed a favorable trend (extubation J3-34) with removal of material to three months. The fourth patient died in a context of multiple organ failure due to sepsis of pulmonary origin.

Conclusions: The Nuss technique could be efficient for the stabilisation of the flaps previous lesions at high-risk of instability wall. The advantage of this technique relies on the fact that a single action, short, is made to contain outbreaks of multiple fractures, sometimes complex and incompletely accessible to surgery. This technique could facilitate a strategy of rapid attachment and early traumatic anterior osteosynthesis.
Objective: Surgical repair of the pectus deformities are mostly performed operatively 6th month. The data was analysed using paired parents (or partners according to their age), preoperatively and on the post-operatively in quality of life and overall satisfaction in patients who have undergone a last decade. This prospective study was conducted to explore the changes repair has become the treatment of choice for pectus excavatum in the last 10 years. Nineteen percent of the patients were satisfied with the surgical methods. Twenty-five patients with lung cancer underwent chest wall resection between 1996 and 2009 at our institutions. Of those, 9 who underwent chest wall removal with rib head resection via a CTLR approach (group A) and 16 without rib head resection (conventional rib resection, group B) were retrospectively analyzed. Results: Three patients in group A underwent chemoradiotherapy and one in group B underwent chemotherapy as induction therapy. All rib head resections were conducted through a CTLR approach without postoperative complications. There were no hospital deaths in group A and one in group B. The mean number of resected-rib heads was 1.9 in group A, while a mean 2.1 ribs were removed in group B. There was no significant difference for operation time between groups A and B (346±99 and 295±102 min, respectively, P=0.129). Local recurrence was seen in no patients in group A and 4 in group B (P=0.10). The median survival time was 920 and 727 days, respectively, while 5-year survival rates were 0.25 and 0.35, respectively. Conclusions: A rib head resection via a CTLR approach is a feasible procedure for T3 lung cancer infiltrating the rib head.

Objective: Surgical repair of the pectus deformities are mostly performed operatively 6th month. The data was analysed using paired parents (or partners according to their age), preoperatively and on the post-operative process removal. Methods: Twenty-five patients with lung cancer underwent chest wall resection between 1996 and 2009 at our institutions. Of those, 9 who underwent chest wall removal with rib head resection via a CTLR approach (group A) and 16 without rib head resection (conventional rib resection, group B) were retrospectively analyzed. Results: Three patients in group A underwent chemoradiotherapy and one in group B underwent chemotherapy as induction therapy. All rib head resections were conducted through a CTLR approach without postoperative complications. There were no hospital deaths in group A and one in group B. The mean number of resected-rib heads was 1.9 in group A, while a mean 2.1 ribs were removed in group B. There was no significant difference for operation time between groups A and B (346±99 and 295±102 min, respectively, P=0.129). Local recurrence was seen in no patients in group A and 4 in group B (P=0.10). The median survival time was 920 and 727 days, respectively, while 5-year survival rates were 0.25 and 0.35, respectively. Conclusions: A rib head resection via a CTLR approach is a feasible procedure for T3 lung cancer infiltrating the rib head.

P-054
RIB HEAD RESECTION VIA COSTOTRANSVERSE LIGAMENT RELEASE APPROACH FOR PATIENT WITH NON-SMALL CELL LUNG CANCER INVADING CHEST WALL
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Objective: Lung cancer located in the paravertebral region occasionally invades the rib head (T3), but not the vertebral (T4). In such cases, a costotransverse ligament release (CTLR) approach might be useful for complete resection without transverse process removal.

Methods: Twenty-five patients with lung cancer underwent chest wall resection between 1996 and 2009 at our institutions. Of those, 9 who underwent chest wall removal with rib head resection via a CTLR approach (group A) and 16 without rib head resection (conventional rib resection, group B) were retrospectively analyzed. Results: Three patients in group A underwent chemoradiotherapy and one in group B underwent chemotherapy as induction therapy. All rib head resections were conducted through a CTLR approach without postoperative complications. There were no hospital deaths in group A and one in group B. The mean number of resected-rib heads was 1.9 in group A, while a mean 2.1 ribs were removed in group B. There was no significant difference for operation time between groups A and B (346±99 and 295±102 min, respectively, P=0.129). Local recurrence was seen in no patients in group A and 4 in group B (P=0.10). The median survival time was 920 and 727 days, respectively, while 5-year survival rates were 0.25 and 0.35, respectively. Conclusions: A rib head resection via a CTLR approach is a feasible procedure for T3 lung cancer infiltrating the rib head.

P-055
QUALITY OF LIFE OUTCOMES AFTER MINIMALLY-INVASIVE REPAIR OFPECTUS EXCAVATUM
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Objective: Surgical repair of the pectus deformities are mostly performed due to the cosmetic, psychological and social problems. Minimally-invasive repair has become the treatment of choice for pectus excavatum in the last decade. This prospective study was conducted to explore the changes in quality of life and overall satisfaction in patients who have undergone a minimally-invasive repair of pectus excavatum.

Methods: One hundred and forty patients, 120 male and 20 female, with a median age of 16 years (range: 6-35) were included in the study. A modified two-step Nuss Questionnaire was applied twice to both the patients and their parents (or partners according to their age), preoperatively and on the post-operative 6th month. The data was analysed using paired t-test to determine statistical significance of differences, with a <0.05 level of significance.

Results: The results based on these data revealed a statistically very significant improvement (P<0.0001) on the overall quality of life and a high level of satisfaction following surgery. Both the psychosocial (P<0.0001) and physical (P<0.0001) components revealed a statistically very significant improvement. Ninety-five percent of the patients were satisfied with the surgical outcome. Only seven patients fell into a low satisfaction group, six of them requiring reoperation for unsuccessful repair.

Conclusions: Minimally-invasive repair has a positive impact on both the physical and psychosocial well-being of children and young adults who are suffering from pectus excavatum.

P-056
EXTENDED LATISSIMUS DORSI AND THORACOLUMBAR FASCIA FLAP FOR MASSIVE FULL THICKNESS THORACIC WALL DEFECTS
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Objective: Chest wall resection and reconstruction can be performed with the soft tissue elements of the chest wall were allowed to collapse against the non-compliant lung parenchyma to obliterate the residual space. Results: No air-leak or infectious complications were present postoperatively. The patients were discharged within five days with no intercostal drains in situ.

Methods: We report a technique for this purpose using a modified latissimus dorsi flap harvested in continuity with the thoracolumbar fascia. The vascularized fascia was sutured into the chest wall defect, providing a stable base for the muscular component of the flap. Patients requiring large full-thickness resections of the anterolateral chest wall for chronic infections were treated accordingly.

Results: Ten patients underwent chest wall locally infected resection with reconstruction by modified latissimus dorsi flap. There were no intraoperative or postoperative complications and prompt extubation was possible without postoperative ventilation or tracheotomy. Healing of the infected chest wall was observed in all patients. Postoperative cine-magnetic resonance imaging revealed concordant movements of the replaced segments with no evidence of paradoxical motion during inspiration and expiration.

Conclusions: This technique is easy and safe. It allows a stable and satisfactory reconstruction after large anterolateral full-thickness chest wall resections of infected and previously irradiated tissues using only well-vascularized autologous tissue.

P-057
THORACOSCOPIC DIaphragm Plication FOR PATIENTS WITH ACQUIRED DIAPHRAGM PARALYSIS
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Objective: There is still limited data on the advantages and disadvantages of VATS diaphragm plication. Some authors describe the difficulties of positioning a sufficiently tense diaphragm using VATS. We would like to describe our technique and results of diaphragm plication by VATS.

Methods: Between January 2008 and December 2010, seven adult patients with acquired diaphragm paralysis (DP) were underwent VATS diaphragm plication by proposed method. Mean age was 37±7 years. The etiology of paralysis was trauma (2 cases), cardiac bypass surgery (4 cases) and idiopathic (1 case). Five patients had left- and two right-sided paralysis. Surgical technique: double-lumen endotracheal ventilation was used. The first trocar we insert along the midaxillary line - through the third intercostal space. The second trocar we place in the lowest point of the costo-vertebral sinus along the posterior axillary line. Then, drawing down the diaphragm, we insert the third trocar in the contralateral sinus. We continue to draw down the diaphragm using folded retractor until arising of two diaphragmatic plicas along the edges of the instrument. Using EndoStitch we suture tissue excess above the instrument and perform duplication. Thereby we replace dome of the diaphragm at a level of the eighths to ninth intercostal space creating several duplications.

Results: There were no operation-related morbidity and mortality rate. Control CT-scan in the 2nd and 6th weeks after operation showed diaphragm position on level between VIII and IX intercostal spaces in all cases. All patients have sustained pulmonary function tests improvement (P<0.05 and FEV1).

Conclusions: VATS diaphragm plication allows to treat DP in early stages of disease without excessively operation trauma related with standard thoracotomy. According to our experience it is secure and effective operation, that could be consider as a method of choice for patients with acquired DP.

P-058
MODIFIED SAWAMURA THORACOPLASTY: AN OLD TECHNIQUE STILL CURRENT FOR MANAGING COMPLEX EMPYEMAS IN ADULTS WITH EXCELLENT FUNCTIONAL AND AESTHETIC RESULTS
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Objectives: Thoracoplasties operations are complex and include resection of osseous chest wall elements to obliterate a rigid and septic intrapleural space. Alternatively a fenestration may be performed. In the later scenario a second “muscle flap transfer”, ciggert or thoracoplasty procedure is necessary to obliterate the residual space. The journey is complex for patients and surgeons and costly for any health care system. Additionally, such procedures are cosmetically not acceptable from patients, leading to a variable degree of shoulder dysfunction as well.

Methods: We managed two adults (mean age 51 years) with supplicative complex pleural effusions and trapped lungs after failed medical therapy by a modified Sawamura technique which seems to have been abandoned at recent years. Ribs were essentially stripped from periosteal beds but preserved and the soft tissue elements of the chest wall were allowed to collapse against the non-compliant lung parenchyma to obliterate the residual space.

Results: No air-leak or infectuous complications were present postoperatively. The patients were discharged within five days with no intercostal drains in situ.
The respiratory performance remained unchanged. The cosmetic result was excellent with the scapula and shoulder supported by the unresected rib arcs. Considering the modified Sawamura the reconstructive technique should be one of the options to be offered in patients with complex empyemas after previously failed medical or surgical treatment. It requires meticulous and generous ‘stripping’ of the ribs corresponding to the empyema space with no intercostal bundle and soft tissue disruption. There is no visual chest wall deformity upon completion of the procedure with aesthetically pleasing results. It offers a single cost effective procedure for treating complex empyema spaces with no need for revisions. It is extremely attractive in practices were community or tertiary care resources and finances are limited.

P-059
EXTENDED CHEST WALL RESECTION FOR AGGRESSIVE FIBROMATOSIS OF BREAST
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Objectives: The fibromatosis is rare of primary breast tumors. This is a non-malignant disease of the breast. After successful surgical treatment the local recurrence is up to 25% of the cases. At an advanced stage the fibromatosis can infiltrate the chest wall. In our paper we take a report about a surgical treatment of aggressive fibromatosis with chest wall infiltration by mesh graft and transverse rectus abdominis myocutaneous (TRAM) flap.

Methods: We present the case of a 23-year-old woman who had surgical resection by right breast tumor, after fine needle aspiration cytology and mammography examinations. The pathological report showed aggressive fibromatosis of the breast. A half year later we detected local recurrence of the tumor. At this time the CT examination showed infiltration of the sternum margin. The woman was pregnant so she did not take the surgical treatment at this time. The tumor expanded during her second pregnancy. We were able to perform the final surgical treatment two and half years after the detection of the local recurrence of the tumor. We resected the tumor together with the half part of the right breast. We performed the partial resection of the sternum and four ribs. We reconstructed the chest wall by artificial mesh graft and right TRAM flap.

Results: We did not have postoperative complication. The patient lives in a good plastic condition without any local recurrence.

Conclusions: We have good surgical possibility by treatment of the aggressive fibromatosis of the breast. The results of the successful surgical treatment are better at the earlier stage of the tumor.

P-060
EVALUATION OF MORBIDITY AND MORTALITY AFTER CHEST-WALL RESECTION
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Objectives: Chest wall involvement occurs in <8% of patients with newly diagnosed non-small-cell lung cancer. There is only less information about the morbidity and mortality after combined lung-chest wall resection. We analyse the morbidity and mortality after chest wall resection in our institution. Methods: By using the prospective database we analyse the complications followed chest wall resections in all patients with non-small-cell-lung cancer, operated in our institution between 2006 and 2009 and compare the data with the morbidity and mortality after normal lobectomy in the same period. We generate three groups: 1. En-bloc resection of lung and chest-wall in case of a pancoast tumor; 2. en-bloc resection of lung and chest wall without a pancoast tumor; 3. single chest wall resection.

Results: From 2006 to 2009, we perform 1280 anatomical resections for lung cancer in our institution. Seventy-eight cases are en-bloc resection of the lung and the chest wall (6%). The percentage of pancoast tumors in this group is 42% (group 1). Group 2 includes 45 Patients and we perform 64 chest wall resections without lung resection (group 3). Ninety-one percent of the patients in group 1 had a neoadjuvant radiochemotherapy.

Conclusions: The rate of pulmonary complications after en-bloc resection of lung and chest wall is significantly higher in comparison to isolated lung or chest wall resection. In the pancoast group the morbidity and mortality rate after resection is higher than in case of lower tumor localization. Mortality rate after combined resection of a pancoast tumor is 4 times higher than after a standard lobectomy. Neoadjuvant radiotherapy seems to be an independent risk factor. Because there are no comparable curative treatment options, the increased morbidity and mortality is maintainable.

P-061
FUNCTIONAL RESULTS AFTER CHEST WALL STABILIZATION WITH A NEW SCREWLESS FIXATION DEVICE
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Objectives: Prospective study of chest wall integrity and pulmonary function in patients who underwent chest wall stabilization with a new screwless fixation device (STRATOS™, MedXpert, Germany). Methods: Between 2008 and 2010, 80 patients (65 males, 15 females) with a mean age 54 years (22-88) underwent chest wall stabilization. Indications included anterolateral flail chest and dislocated rib fractures with shrinkage. Titanium rib clamps were placed and fixed to the stable parts of the most effected ribs and connected by titanium plates. Clinical outcome, pulmonary function testing and dynamic assessment of the chest wall mobility by cine MRI were performed six months following surgery. Results: 42 (25.5%) patients had various combination of injuries of the thorax, head, abdomen and extremities. Median number of stabilised ribs was 4.17 (2-9) with a medium delay from admission till operation of 5.4 days (1-14). No plate dislocation was observed during the follow-up. Due to local infection, the implants were removed in 2 (2.5%) cases. In-hospital mortality rate was 1.25% (1 of 80). Pulmonary function testing at six months after the operation was done till now in 61 (76.25%) patients. The data show no restriction. Median ratio of the recorded vital capacity (VC) was 86.1%. Cine MRI showed symmetrical movement of the chest wall. Conclusions: Our results suggest that in selected patients, extended chest wall injury accompanied by respiratory insufficiency can be effectively stabilised by screwless titanium fixation device. Early restoration of the chest wall integrity and respiratory pump function prevents restriction-related lung dysfunction.

P-062
MINIMALLY-INVASIVE REPAIR OFPECTUS CARINATUM: A SINGLE INSTITUTION EXPERIENCE
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Objectives: Minimally-invasive repair of pectus carinatum was defined by Abramson as a modification of the Huss procedure, and it has been gaining support in the recent years. We have been performing minimally-invasive repair of pectus carinatum in our institution since 2006. This prospective study describes our experience with our own bar and stabilizing system developed for the minimally-invasive repair of pectus carinatum.

Methods: Following the first 3 case being operated on placing regular excr- etatuum bars presternally, we developed our own carinatum bar and stabilizing system in 2008. Between July 2008 and January 2011, 35 pectus carinatum patients between the ages of 10 and 27 (median: 15) were operated using this minimally-invasive technique following the basic surgical principles described by Abramson.

Results: One bar and two stabilizers were used in all patients for the correction of the deformity. The median operation duration was 60.5 min (range: 45-110) and the median duration of hospital stay was 4.5 days (range: 2-10). Excellent esthetic results obtained regarding the postoperative course, verified with the patients’ and parent’s answers on a satisfaction questionnaire; all patients except one (97.2%) feeling satisfied with surgical outcome. Five of the bars have been removed on planned time without any recurrence.

Conclusions: Minimally-invasive repair of pectus carinatum placing a pect- esternal bar can be preferred for the short operating time, low morbidity and high levels of patient satisfaction.

P-063
ANALYSIS OF TEN CONSECUTIVE CASES OF THORACO-BILARY FISTULA
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Objectives: To analyse the outcome of surgery for thoraco-biliary fistula developed as a complication of prolonged subdiaphragmatic suppuration.

P-064
INFLUENCE OF AIRWAY EXPOSURE ON POSTOPERATIVE OUTCOME IN PATIENTS WITH CARCINOMA OF THE LUNG
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Objectives: To determine the influence of airway exposure on postoperative outcome in patients undergoing lung resection for lung cancer.

Methods: From May 2008 to May 2012, 360 patients of 471 operated for lung cancer were included in the study. The patients were divided into two groups according to the airway exposure during surgery. Group 1 included 180 patients (49.98%) with no tracheal manipulation, while Group 2 included 180 patients (50.02%) with tracheal manipulation. Analysis of the preoperative and postoperative periods was performed. Results: There were no significant differences in the preoperative period between the two groups. In the postoperative period, patients in Group 2 had longer hospital stays (p = 0.01), more complications (p = 0.02), and higher mortality rates (p = 0.007) than those in Group 1. Conclusions: Our findings suggest that tracheal manipulation may negatively affect the postoperative outcome in patients with lung cancer.

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Methods: Between 1 January 1985 and 31 December 2010 in our unit we treated 10 patients with thoraco-biliary fistula complicated with intrathoracic suppurations requiring major surgery. Primary etiology was hydatid disease in 8 patients and biliary lithiasis in 2 patients. Treatment consisted in thoracotomy with solving of the intrathoracic lesions through decortication and/or resection, phrenotomy with debriadiation and drainage of the hepatic/subphrenic cavity and closure of the diaphragmatic defect. In five cases we were able to perform immediately the abdominal part with deobstruction and drainage of the common bile duct through a separate laparotomy (one-stage bipolar approach) while in the other five patients this was impossible due to poor biological status. Outcome in terms of mortality, morbidity and recurrence was followed. Results: We encountered one postoperative death through uncontrollable sepsis. In terms of morbidity, all the major complications occurred in the group of patients in whom we were unable to perform deobstruction of the common bile duct in the same stage (two recurrences of the thoraco-biliary fistula requiring reoperation and one external fistula treated conservatively) while in the one-stage bipolar approach we encountered only one pleural empyema treated by operated thoracentesis and one future granuloma. Postoperative hospitalisation ranged between 21 and 156 days, with a median of 55 days. At late follow-up (between 1.5 and 20 years) we encountered no recurrence of the fistula. Conclusions: Thoraco-biliary fistula is a rare but very serious situation due to the extension of the lesions and sepsis. It requires complex procedures involving an extremely high morbidity. Use of less invasive procedures may improve the outcome of these patients.

P-064 PROSPECTIVE TRIAL EVALUATING SONOGRAPHY AFTER THORACIC SURGERY (SATS) IN POSTOPERATIVE CARE AND DECISION-MAKING E. Goudie, I. Bah, M. Kherba, P. Ferraro, A. Duranceau, J. Martin, V. Thiffault, M. Liberati Thoracic Surgery, Chum Endoscopic Tracheobronchial and Oesophageal Center (CETOC), University of Montreal, Montreal, Canada

Objectives: Following thoracic surgery, daily chest X-rays (CXRs) are performed to assess patient evolution and to make decisions regarding chest tube removal and patient discharge. Sonography After Thoracic Surgery (SATS) has the potential to be an effective, convenient, inexpensive and easy to learn method. We hypothesized that SATS could alleviate the need for repetitive CXRs, thus reducing the related costs, risks and inconvenience.

Methods: This study consisted of a prospective cohort trial. All patients scheduled to undergo thoraco surgery at a single academic medical center were eligible. Postoperative bedside pleural ultrasound was performed whenever a CXR was ordered by the treating team. Investigators specifically assessed patients with the goals of identifying pleural effusions and pneumothoraces. Study investigators were blinded to CXR results. SATS findings were compared to CXRs, which were considered the “gold-standard” in routine postoperative pleural space evaluation.

Results: One hundred and twenty patients were prospectively enrolled over a 5.5 month period. Three hundred and fifty-two ultrasound examinations were performed (mean 3.0±2.4 exams per patient). The time interval between the ultrasound and the comparative CXR was 16±149 min. The mean time required to perform SATS was 11±7 min per exam. To detect pleural effusion, SATS yielded a sensitivity of 83.1% and a specificity of 59.3%. In the detection of pneumothoraces, a sensitivity of 21.2% and a specificity of 94.7% were obtained.

Conclusions: Postoperative ultrasound may alleviate the need to perform routine CXR in patients with a previously ruled out pneumothorax. SATS used selectively may be able to reduce the number of routine CXRs performed, however, does not have enough accuracy to replace CXRs.

P-065 AUTOFLORESENCE VATS EXPERIENCE: 23 CASES S.T. Liman, A. Elicora, A.G. Akgil, S. Mehmetoglu, S. Topcu Thoracic Surgery Department, Kocaeli University, Faculty of Medicine, Kocaeli, Turkey

Objectives: Videothoracoscopy is the frequently used surgical technique in thoracic surgery. It is performed for both diagnosis and treatment of pleural pathologies. It is seen that white light is insufficient in some lesions especially for pre-malignant lesions in endoscopic procedures like bronchoscopy and autoflorescence systems is used. It has been used in thoracoscopy also. We would like to discuss our 23 cases here, even it is a small series there is very small amount of information in literature. Autoflorescence VATS was first used in our clinic in Turkey.

Methods: Autoflorescence VATS was used in 23 cases (7 female, 16 male) in our clinic. The diagnosis was not achieved from previously performed examinations to explain the etiology of pleural fluid in all cases.

Results: There were 13 autoflorescence positive and 10 autoflorescence negative results. Autoflorescence examination showed positive results in five cases with malignant mesothelioma. In four cases with chronic pleuritis, one case with adenocarcinoma, one case with adenoid cystic carcinoma metastasis, one case with lymphoma metastasis and one case with gastric carcinoma metastasis. Two necrotising granulomatous pleuritis had negative results. The other negative results were detected in six chronic pleuritids. Two patients with malignant mesothelioma had negative result. Conclusions: This system is very useful in determining the biopsy sites and mapping of pleural pathologies. It was seen that for autoflorescence examination, malignant mesothelioma may be one of the situations that this system may give false negative results. In other pleural malignancies there was no false negative results even they were low grade malignancies. Autoflorescence VATS was positive in four cases with benign pathology. Those results showed us that correct evaluations might be achieved if the number of cases were getting larger.
Ten-year survival for benign and malignant SFTsP were 92.9% and 55.1%. Postoperative complications occurred in one patient (2.3%). Follow-up was for malignant SFTsP and 5.3 for benign. Operative mortality was 2.3% (1/44). Resection was complete in all patients with benign tumor and incomplete in 16 (33.4%); it was benign in 35 cases (72.9%) and malignant in 13 (27.1%).

Tumors originated from visceral pleura in 34 cases, and from parietal in 4, and multiple symptoms in 7). Operative approach included thoracotomy in 19 cases, decortications, three exploratory thoracotomies for chest wall or inferior mediastinal lesions in 22 left-sided. Forty patients underwent EPP, one pleural decortication, two thoracoscopic thoracotomies for chest wall or inferior vena cava invasion, and one laparoscopy for peritoneal metastases. One patient were no surgical proposed for macroscopically evidence of extended disease and received chemotherapy. Thirty-seven patients had epithelioid tumor. The median follow-up for all surviving patients was 36 months. Disease free survival were 11 and 21 months for the high and low SUV groups, respectively. Median survivals were 16 and 29 months for the high and low SUV groups, respectively. In a multivariable analysis, high SUV tumors were associated with a 4.1 times greater risk of death than low SUV tumors (P=0.04).

Conclusions: PET/CT appears to give a good support in staging and prognosis in MPM. A systematic use of PET scan could be anticipate the recurrence of MPM in follow-up period in EPP submitted patients.

P-070

DOES AN INCREASED INTEREST IN MESOTHELIOMA SURGERY WITHIN A MULTI-DISCIPLINARY TEAM HAVE AN IMPACT ON TREATMENT TRENDS?

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Objectives: The last decade has seen an increased surgical interest in Malignant Pleural Mesothelioma (MPM). A multi-disciplinary approach to management has been established to improve patient care. In our unit, this resulted in the continuous appointment of surgeons with an interest in mesothelioma surgery since 2006. We aimed to study the impact on our surgical practice of this increased interest in surgical management within the confines of various MDT.

Methods: A review of a prospective database of patients who underwent surgery from 2001 to 2010 was carried out. Patients treated from 2001 to 2005 (Group A) were compared to those treated in the second half of the decade (Group B). Demographics, Peri-Operative and Survival data were compared between the 161 patients (134 male, median age 67 (range 36-84) years) in Group A, and the 130 patients (114 male, median age 69 (range 47-83) years) in Group B.

Results: Spirometry was better in Group B (median FEV1 of 66% vs. 57% in Group A, P=0.01). Fifty-one percent of patients in Group A were not subtyped by histopathology while only 2% of Group B were reported as ‘non-specific MPM’, P=0.001. The overall median survival (±S.E.M.) of Group A was 9.01±0.8 vs. 15.59±1.04 months in Group B (P=0.003). The operative mortality was not significantly different (P=0.2), but median hospital stay increased from six to seven days (P=0.01).

Conclusions: In second half of last decade, patients undergoing mesothelioma surgery were older, their histological assessment was more complete, and underwent an increased rate of debulking/‘radical’ procedures. We have observed a demise of open palliative procedures. An overall improvement in survival is clear, probably multifactorial in origin.

P-071

RESULTS OF ADJUVANT INTENSITY MODULATED RADIATION THERAPY INCORPORATED TRIMODALITY TREATMENT IN MALIGNANT PLEURAL MESOTHELIOMA


1Department of Radiation Oncology, Acibadem University, Istanbul, Turkey; 2Thoracic Surgery, Marmara University Hospital, Pendik, Istanbul, Turkey; 3Department of Internal Medicine, Division of Medical Oncology, Marmara University Hospital, Istanbul, Turkey

Objectives: Locoregional recurrence is a significant problem in malignant pleural mesothelioma (MPM). We analyzed our MPM patients who received IMRT as the adjuvant radiotherapy treatment following surgery. Patients underwent pleurectomy or extrapleural pneumonectomy (EPP) and were referred to radiation oncology service for definitive treatment (group A) or palliative treatment (group B).

Methods: Patients with clinical stage III-IV MPM, who underwent surgery, adjuvant IMRT and chemotherapy between 2008 and 2010, were included. Patients underwent pleurectomy or extrapleural pneumonectomy (EPP). One month following surgery, patients were treated with intensity modulated radiotherapy with inverse treatment planning algorithm. CT images were obtained with a 2 mm slice thickness of the whole thorax and abdomen. The clinical target volume was defined as the whole thoracic cavity for EPP patients, and tumor bed around the lung for pleurectomy patients. The target volume and critical organs were contoured by the same physician (HBC). Patients also received adjuvant chemotherapy (Pemetrexed- Cisplatin). Patient characteristics, treatment toxicity, recurrence and survival were recorded.
A PROSPECTIVE PHASE II STUDY FOR TREATMENT OF MALIGNANT PLEURAL MESOTHELIOMA: RESULTS OF HYPERTHERMIC CISPLATIN-GEMCITABIN AND EXTERNAL RADIOTHERAPY P-072

Survival rates were 87% and 66%.

Mild-moderate toxicity occurred in four patients (1 pleurectomy). Toxicities were dysphagia and pneumonitis. Ten patients received at least three cycles of chemotherapy. Loco-regional recurrence was seen in 4 patients at an average of 18.6 months (2 abdominal and local, 2 local). Two patients died at 13 and 18 months, one from non-mesothelioma related causes. One and 2-year survival rates were 87% and 66%.

Conclusions: IMRT incorporated multimodality treatment appears to achieve good local control and acceptable survival in MPM with low toxicity rates.

P-072 EXTRAPLEURAL PNEUMONECTOMY WITH INTRACAVITARY INTRAOPERATIVE HYPERTERMISCH CISPLATIN-GEMCITABIN AND EXTERNAL RADIOTHERAPY FOR TREATMENT OF MALIGNANT PLEURAL MESOTHELIOMA: RESULTS OF A PROSPECTIVE PHASE II STUDY N. Venissac1, O. Aze2, D. Pop2, L. Brouchet3, S. Khelof2, S. Silbon2, P. Guiraudet2, J. Mouroux2 1Thoracic Surgery, Pasteur Hospital, CHU Nice, Nice, France; 2Pasteur Hospital, Nice, France; 3Larrey Hospital, Toulouse, France

Objectives: The aim of this prospectively phase II study was to determine the feasibility and safety of hyperthermic intraoperative intracavity based on cisplatin and gemcitabine perfusion association, after extrapleural pneumonectomy in the treatment of malignant pleural mesothelioma. Secondary objective was survival.

Methods: The therapeutic protocol consist in Patients with proved (meso-path) mixed or epithelioid mesothelioma who were surgical candidates. They underwent extrapleural pneumonectomy followed by hyperthermic intraoperative intracavitary chemotherapy infusion (42°C). This consisted of 1 h intra-thoracic lavage with cisplatin 100 mg/m² and gemcitabine 1250 mg/m². Morbidity and mortality were recorded prospectively.

Results: Eighteen patients were enrolled for extrapleural pneumonectomy. In two cases, local tumor invasion give up resection. Sixteen underwent resection and 15 received hyperthermic intraoperative intracavitary chemotherapy (1 case of failure because of technical problem). All were men and median age was 60 years. Histology was epithelioid for 14 patients and mixed for two patients. Ninety days mortality was 6.6% (1 patient). Major morbidity was 57%. In four cases, atrial fibrillation, in one case (before use of thiouislate as renal protection, one reversible renal failure requiring dialysis, 14 received blood transfusion (median 8 units). Fourteen patients underwent 54 Grays external radiotherapy (78%). Recurrence appeared in seven patients, two local (13%) and 5 distant, in a median time of 14.3 months. Median survival was 25 months. Three and five years survival rates were, respectively 46% and 23%.

Conclusions: For selected patients, extrapleural pleuropneumonectomy with hyperthermic intracavitary cisplatin-gemcitabin perfusion can be safely performed. Seventy-eight percent of patients in our study completed the treatment. Morbidity and mortality are acceptable with a good local control. Morbidity and mortality were recorded prospectively.

V-074 NEW MINIMALLY-INVASIVE TECHNIQUE FOR CORRECTION OFPECTUS CARINATUM D. Pérez-Alonso, J.R. Cano, S. Quevedo, L. López Thoracic Surgery, Complejo Hospitalario Universitario Materno Insular, Las Palmas de Gran Canaria, Spain

Objectives: We describe a new video-assisted operative technique for correction of pectus carinatum (PC) using a modified Nuss procedure.

Methods: A new design of the steel bar was developed, so that it could be inserted and placed in a suitable position through very small skin incisions. Substantial modifications were introduced in the bar length and shape aimed at facilitating insertion and subsequent removal when required. All the surgical maneuvers took place under direct vision using a 30° thoracoscope. Results: Single unilateral fixation of the bar in a subpectoral pocket provided satisfactory stabilisation without the need for lateral stabilisers. Adequate correction of the deformity was achieved with minor postoperative scars. Conclusions: Our results support the view that minimally-invasive surgical repair should be preferred over open surgery for correction of pectus carinatum in young adults and children.

V-075 LEFT SEGMENT 9 SEGMENTECTOMY USING INDOCYANINE GREEN DYE FOR LUNG CANCER: A NEW METHOD FOR DETECTING INTER-SEGMENTAL PLANE S. Oh, K. Suzuki, K. Takamochi, Y. Miyasaka, T. Matsuanga, Y. Kitamura, M. Fukui General Thoracic Surgery, Juntendo University, Tokyo, Japan

Objectives: Segmentectomy could be one of the mainstay for the treatment for resectable lung cancer. Randomized control trials of lobectomy vs. segmentectomy for small lung cancer are ongoing now. One of the most difficult points in a complete segmentectomy is to detect the inter-segmental plane while maintaining enough surgical margin. The method for detecting the inter-segmental plane remains controversial.

Methods: The patient had an about 14 mm nodule in left segment 9. We judged that she had an early lung cancer. And we recommended her the operation of left segment 9 segmentectomy. Operative procedures: 1) Expose the pulmonary artery, vein and bronchus. 2) Ligate a segmental bronchus following the division of pulmonary artery and pulmonary vein. 3) Then inject indocyanine green into the segment through bronchus. 4) The segment turns green following the injection. 5) The border of an inter-segmental plane is easily detected not only pleural surface but also pulmonary parenchyma. Conclusions: After indocyanine green injection, we recognized the inter-segmental plane between segment 8 and 9, segment 9 and 10. And we performed the segment 9 segmentectomy easier and safely. There were no complications concerned with the dye injection. The bleeding and air leakage of this procedure was a little.

Conclusions: Even though segmentectomy of a central segment{9}, such as left segment 9 is difficult, we can perform the segmentectomy safely and easily.
We developed a new technique for performing segmentectomy. As segmentectomies become more and more prevalent, the indocyanine green method will allow for greater precision and ease.

V-076  
UNIQUE RECONSTRUCTION TECHNIQUE IN A YOUNG PATIENT AFTER MANUBRIAL RESECTION IN GRADE II CHONDROSARCOMA

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Objectives: Approximately 30% of malignant, primary bone tumors are chondrosarcomas, a most frequent develop on the anterior chest wall. Patients who are treated with adequate surgical intervention recover, 10 years survival rate is 97%. Besides the aesthetic outcome, preservation of breathing and loading are crucial.

Methods: Authors present a case of a 44-year-old male patient operated on Grade II chondrosarcoma of the manubrium. Concerning the youth of the patient, immediately reconstruction was carried out. The infiltrated part of the sternum was resected with wide margins. The reconstruction was performed with Dual Mesh covered by a pedicled left sided pectoral major muscle. As a unique technique, authors used the tendon of the semitendinosus muscle to fix both clavicles together to give the stability and function for the chest wall.

Results: After an uneventful postoperative period the patient had a fast recovery.

Conclusions: There are no data in the literature for such a method to fixate the anterior chest wall. The method is suggested by the authors.

V-077  
ONE STAGE RECONSTRUCTION OF A COMPLEX TRACHEO-BRONCHIAL ANOMALY

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Objectives: Congenital anomalies of the major airways are rare but challenging disorders for the surgeon if reconstruction is needed.

Methods: A 21-year-old ex-premature female was referred to our department with stridor since birth. A bronchoscopy at the age of 12 years revealed a stenosis of the right main bronchus. Conservative treatment was advised as symptoms were only pronounced on exertion. Over the last years, breathing problems gradually increased during physical activities. A repeat bronchoscopy + spiral CT-scan of the chest revealed circular chondral rings in the trachea without membranous part, a left posterior tracheal diverticulum 7 cm below the vocal cords with stenosis of the distal trachea and the right main bronchus until the level of the intermediate bronchus and a carinal bronchus to the right upper lobe. The left bronchial tree was normal.

Results: In this video, the complex tracheo-bronchial reconstruction is demonstrated. We performed a one stage procedure through a right thoracotomy including sleeve resection of the distal trachea with diverticuloplasty, sleeve resection of the right stem bronchus with reimplantation of a neosubcarina between upper lobe bronchi and bronchi intermedius into the native carina. No parenchymal resection was needed. The entire operation was executed with the aid of intermittent intubation and ventilation of the left lung in the operative field. The use of extracorporeal oxygenation was not needed. Intraoperative bronchoscopy showed patent anastomoses and airflow to left and right lung. The patient was extubated immediately after wound closure without the need for ventilatory support postoperatively. Flow volume loop was improved six months after the procedure.

Conclusions: A one stage reconstruction of a complex congenital tracheo-bronchial anomaly is feasible without extracorporeal circulation.

V-078  
BRONCHOPLASTIC LEFT LINGULAR AND LOWER LOBE RESSECTION OF LUNG CANCER IN A PATIENT WITH CONTRA-LATERAL BENIGN ATELECTASIS OF MIDDLE AND LOWER LOBE

Y. Tsuchina, K. Takamochi, S. Oh, K. Suzuki  
General Thoracic Surgery, Juntendo University Hospital, Bunkyo-ku, Japan

Objectives: Bronchoplasty and/or angioplasty procedure are fairly effective for resecting lung cancer, avoiding pneumonectomy. Those procedures also contribute to lung resection in compromised patient, such as poor lung function.

Methods: We hereby present a case with poor lung function due to tuberculous atelectasis of contra lateral middle and lower lobe. We performed surgical resection of lung cancer located in the left lower lobe. Patient was a 68-year-old man and had bloody sputum. Computed tomography revealed lung cancer located in the left hilum and atelectasis of right middle and lower lobe. Preoperative bronchoscopy confirmed this finding, showing complete obstruction of bronchus intermedius. Thus, the patient remains alive with right upper lobe and left lung. Oncologically surgical resection was indicated. However, if pneumonectomy would be performed, the patient must be alive with only right upper lobe of the lung. Therefore, pneumonectomy should be avoided.

Results: Surgical resection was performed through posterolateral thoracotomy, and tumor appears to be resectable. To resect tumor left lingular and lower lobe resection combined with left atrium were necessary. Bronchoplasty was also needed to make anastomosis between the left main bronchus and left superior division bronchus. This plastic procedure was performed with 4-0 Prolene with interrupted sutures. Lung cancer was diagnosed to be squamous cell carcinoma, and completely resected. Intraoperative blood loss was 500 cc and operative time was 5 h and 11 min. The patient had postoperative empyema, but it was improved by irrigation. Preoperative pulmonary function was FEV1, 1.62 l and postoperative pulmonary function was FEV1, 1.41 l. The patient needs no oxygen therapy and remains good performance status. 

Conclusions: Thus, this patient is alive with right upper lobe and left superior division. We present this rare mode of surgery using high vision mode of movie.

Session VI - Pulmonary Neoplastic

Monday, 6 June 2011
14:00-15:30

O-079  
LYMPH-NODE MICROMETASTASES AFFECT LONG-TERM SURVIVAL AND DISEASE-FREE INTERVAL IN LUNG CANCER PATIENTS

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Objectives: Most stage I lung cancer patients undergo a complete resection of their tumor but they still harbor a considerable risk to die from recurrence. An association between presence of lymph-nodes micrometastases and poor prognosis has been observed. The aim of the study is to correlate the lymph-node molecular staging with five years survival and disease-free interval following pulmonary lobectomy for NSCLC.

Methods: From 2000 to 2003 the patients with operable NSCLC referred to our unit have been enrolled if their histories were negative for previous malignancy. At operation, all the accessible mediastinal lymph-nodes were gathered and divided: one half was frozen for molecular study and the second half was fixed for routine examination. After lobectomy, the hilar lymph-nodes were treated in the same way and tumor specimens were also frozen. Quantitative real-time reverse-transcriptase polymerase-chain-reaction for carcinoembryonic antigen messenger RNA was performed on primary tumors and lymph nodes. CEA mRNA quantification in lymph nodes was achieved with the standard curve method. The enrolled patients were strictly followed-up for five years; patients were censored if a new malignancy occurred. The disease-free interval and total survival were recorded. 

Results: CEA transcript levels were detected in all the tumors of the 60 patients enrolled. The highest CEA mRNA level among the 14 control lymph-nodes from patients without any malignancies was used as a threshold cycle. Of the 261 analyzed lymph-nodes 35 were positive at molecular staging. Among patients with negative lymph-nodes at classical staging, disease-free interval and total survival were significantly worst in the patient with lymph-nodes positive to molecular staging (P<0.0004 and P<0.0019, respectively).

Conclusions: CEA mRNA molecular analysis can reveal the presence of micrometastasis in lymph-nodes of patients submitted to lobectomy for NSCLC. Such test has a strong correlation with survival and disease-free interval in patients otherwise staged as node negative.
O-080
B-TYPE NATRIURETIC PEPTIDE AND PULMONARY ARTERIAL PRESSURE AS PREDICTORS OF AF AFTER MAJOR PULMONARY RESECTIONS: PRELIMINARY RESULTS IN A PROSPECTIVE SERIES OF PATIENTS
A.G. Roussakis1, C. Zisis1, V.K. Kouritas1, C. Illias1, M. Kolokotron11, C. Tzavara1, A. Spoul5, I. Bellenis5
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Objectives: The evaluation of brain B-type natriuretic peptide (pro-BNP) and pulmonary arterial pressure (PAP) as predictive markers for atrial fibrillation (AF) after major pulmonary resection surgery.

Methods: Thirty consecutive NSCLC patients (male/female: 26/4, mean age 66±8.6(S.D.)) undergoing lobectomy (70%), bilobectomy (3.33%), pneumonectomy (26.67%) were prospectively studied. Preoperative evaluation included spirometry, transthoracic echocardiography with PAP evaluation, 8-lead ECG and pro-BNP plasma level. Pro-BNP was also measured a few hours after surgery and on days 1, 2, 3 and 7 postoperatively. Mann–Whitney and Student’s t-tests were used for the comparison of study markers between two groups. ROC analysis was used to evaluate the predictive ability of BNP and PAP.

Results: Postoperative AF was identified in nine patients (30%). Postoperative ROC analysis was used to evaluate the predictive ability of BNP and PAP.

Conclusions: Intratumoral MI rather than MLP might be a strong risk factor for recurrence for node negative NSCLC. MVI and MLP should be examined separately and be collected for the next revision of the staging system.

O-082
A COMPARISON OF THE COMBINED ULTRASOUND OF THE MEDIASTINUM BY USE OF A SINGLE ULTRASOUND BRONCHOSCOPE VERSUS ULTRASOUND BRONCHOSCOPE PLUS ULTRASOUND GASTROSCOPE IN LUNG CANCER STAGING - A PROSPECTIVE TRIAL
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Objectives: The aim of the prospective trial was to compare a diagnostic utility of the combined ultrasound of the mediastinum in lung cancer staging by use of a single ultrasound bronchoscope (EBUS) - (CUSb) and two scopes: EBUS and ultrasound gastroscopy (EUS) - (CUS).

Methods: In consecutive lung cancer patients in stage IA-IIb the CUS or CUSb were being performed under local anesthesia and mild sedation. All patients were proven by negative result of biopsy subsequently underwent lung resection with systematic lymph node dissection (SLND) of mediastinum as a confirmatory test. Patients: From 01.03.10 to 31.12.10 in 214 lung cancer patients, 110 underwent CUS and 104 CUSb and 618 mediastinal nodes were biopsied. The CUS revealed metastatic nodal involvement in 55/110 patients (50%) and CUSb in 51/104 patients (49%). A prevalence in both groups was 60%. In 55 CUS negative and 53 CUSb negative patients the subsequent SLND revealed metastatic nodes in five patients (4.5%) and in nine patients (8.7%). There was a 'minimal NZ' in 11 out of these 14 patients. A diagnostic sensitivity, specificity, accuracy, PPV and NPV of CUS was 91.7%, 98%, 94.6%, 98.2% and 90.7% and of CUSb was 85%, 93.2%, 88.5%, 94.4%, 82%, respectively. There was no significant difference in sensitivity and NPV of CUS vs. CUSb (P=0.255 and P=0.192). A mean time of CUS (25±4.4 min) was significantly longer comparing with CUSb (14.9±2.3 min) (P=0.001). No complications of both methods were observed.

Conclusions: 1) The combined ultrasound by use of the single EBUS scope is significantly less time-consuming and as equally effective and safe as by use of two scopes (EBUS and EUS). 2) Unless the imaging of the left adrenal gland or liver is required, the single scope combined ultrasound technique may be the standard endoscopic approach for mediastinal lung cancer staging.

O-081
PROGNOSTIC IMPACTS OF INTRATUMORAL MICROVASCULAR INVASION AND MICROLYMPHATIC PERMEATION ON NODE NEGATIVE NON- Small-CELL LUNG CANCER: WHICH INDICATOR IS STRONG PROGNOSTIC FACTOR?
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1Thoracic Surgery, National Cancer Center Hospital East, Kashiwa, Chiba, Japan; 2National Cancer Hospital, Tokyo, Tokyo, Japan; 3Pathology Division, Center for Innovative Oncology, National Cancer Center Hospital East, Kashiwa, Chiba, Japan

Objectives: Microvascular invasion (MVI) and microlymphatic permeation (MLP) have been considered as powerful prognostic indicators for non-small cell lung cancer (NSCLC). Several studies have proposed these reflected on the size-based T factor in the TNM staging system. The aim of the study was to classify the comparative prognostic importance of MVI, MLP, and tumor size in the resected node negative NSCLCs.

Methods: We reviewed consecutive 1339 patients with pathologic size-based stage T1a-T3N0M0 NSCLC who underwent lobectomy or more from 1993 to 2005. Median follow-up period was 9.0 years. MVI and MLP were distinguished by the Victoria blue van Gieson stain. Recurrence-free survival (RFS) was analyzed.

Results: MVI and MLP were observed in 35% (35%) and 20% (20%) of patients, respectively. Both MVI and MLP were significantly more prevalent in non-adeno carcinomas (P<0.001 and 0.0045) and larger-sized tumors (P<0.001 and <0.001). On multivariate analysis, MVI but not MLP proved to be an independent risk factor for recurrence (MVI, HR 1.57, P=0.0024; MLP, HR 1.38, P=0.139). Five- and 10-year rates of either MVI or MLP positive T1a and T1b groups were significantly lower than those of the corresponding double negative (dn) T groups (T1a, P=0.001; T1b, P=0.002) and, overalapped to the survival of dnT2a (dnT1a 92%, MVI-T1a 75%, MLP-T1a 79%, dnT1b 90%, MVI-T1b 76%, MLP-T1b 83%, dnT2a 81%). However, in T2a and T2b, only MVI positive populations revealed significantly lower five-year DFS rates relative to corresponding dn T population, and overlapped to next dn T populations. (dnT2a 81%, MVI-T2a 58%, MLP-T2a 79%, dnT2b 60%, MVI-T2b 40%, MLP-T2b 60%, dnT3 39%).

Conclusions: Intratumoral MVI rather than MLP might be a strong risk factor for recurrence for node negative NSCLC. MVI and MLP should be examined separately and be collected for the next revision of the staging system.
resections were necessary to achieve R0-resection. Treatment related comorbidity was 52%. Hospital mortality was 4.8% (n=7). Overall 5-year survival was 38%. Overall mean and median survival were 61 and 31 months. In case of pneumonectomy mean and median survival was 59 and 26 months, respectively. Neither pneumonectomy (P=0.717), right-sided pneumonectomy (P=0.716) nor initial UCIC-stage (P=0.985), T-stage (P=0.459) or N-stage (P=0.836) were risk factors for survival but pyn-stage (P=0.001), ypT-stage (P=0.001) and ypUCIC-stage (P=0.001). Conclusions: Pneumonectomy as completing procedure in trimodal therapy can be done safely in experienced facilities and represents a valuable and necessary option in neoadjuvant treatment for stage III NSCLC. Survival rates even after pneumonectomy can be superior compared to single modality approaches in selected patients.

**O-084**

**CAINE SCENT DETECTION IN THE DIAGNOSIS OF LUNG CANCER: REVISITING A PUZZLING PHENOMENON**

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Objectives: Lung cancer (LC) continues to be the deadliest form of cancer. Favourable prognosis depends on early diagnosis. Exhaled breath of patients may represent the ideal specimen for LC screening and early diagnosis. However, current technologies based on signal pattern analysis are not reliable diagnostic tools due to their inability to identify a clear target.

Methods: In a prospective study, we tested the exhalation samples of 110 healthy individuals (group A), 60 patients with histologically confirmed lung cancer (Group B) and 50 with COPD (Group C). The specimens were collected in specially designed glass tubes containing an adsorbent matrix. Four sniffer dogs were trained to identify LC in human exhalation samples according to a published protocol. For analysing the diagnostic accuracy of LC detection, each dog performed the following tests: I) group A (n=40) vs. group B (n=10), II) group B (n=10) vs. group C (n=40), III) group B (n=5) vs. group A+C (n=20). Patient history and drug administration were analyzed to identify potential bias or confounders.

Results: Our specially trained sniffer dogs were able to identify LC in one out of five probes with a sensitivity of 90% and a specificity of 72% with a moderate inter-rater variability of v=0.436. Thereby, the detection of LC is independent from COPD and can be reliably discriminated from tobacco smoke, and food odors. Logistic regression identified two drugs as potential confounders.

Conclusions: We confirmed the existence of a stable target that is strongly associated with LC and independent from COPD, but can be reliably discriminated from tobacco smoke, food odors and potential drug metabolites. The integration of sniffer dogs into research strategies for the development of future diagnostic targeting and monitoring devices may advance non-invasive LC screening methods.

**Session VII - Young Investigators**

**Monday, 6 June 2011 14:00-15:30**

**F-085**

**EFFECT OF ANTI-INFLAMMATORY AGENTS ON THE HUMAN PARIETAL PLEURAL ELECTROPHYSIOLOGY**


1Thoracic and Vascular Surgery, Evangelismos Hospital, Athens, Greece; 2Thoracic Diseases, Larissa University Hospital, Larissa, Greece; 3Physiology, Medical School, University of Thessaly, Larissa, Greece

Objectives: Different anti-inflammatory agents are used after thoracic surgery in order to regulate pain. It is not known, however, whether these agents cause pleural permeability alterations and consequently interfere with the postoperative pleural fluid recycling. The aim of this study is to investigate the effects of different anti-inflammatory agents on the electrophysiology of human parietal pleura.

Methods: Parietal pleural specimens were obtained from 12 patients subjected to thoracic surgery and were mounted as planar sheets of tissue (1.43 cm²) between using chambers. Solutions containing paracetamol, prednisolone, acetylsalicylic acid, nimesulide, diclofenac, lornoxicam or parecoxib were added in the chambers facing the pleural and the outer-pleural surface. Seven experiments were conducted for each drug and each specimen surface. Trans-mesothelial resistance (Rₜₘₜ) was determined as a permeability indicator. Statistical significance (P<0.05) was determined with paired t-test whereas comparison between groups was determined with ANOVA (Bonferonni’s post-hoc) test.

Results: Prednisolone induced a rapid Rₜₘₜ decrease on the pleural (P=0.04) and outer-pleural surface (P=0.013). Paracetamol, acetylsalicylic acid, diclofenac and nimesulide induced a rapid Rₜₘₜ increase on the pleural (P=0.03, 0.049, 0.012 and 0.032, respectively) and outer-pleural surface (P=0.022, 0.007, 0.008 and 0.028, respectively). Lornoxicam and parecoxib had no effect on the Rₜₘₜ.

Conclusions: Prednisolone increases pleural permeability and augments pleural recycling whereas paracetamol, acetylsalicylic acid, diclofenac and nimesulide decrease pleural permeability and hinder fluid recycling. Lornoxicam and parecoxib do not affect the pleural permeability. This knowledge should be considered by surgeons who use anti-inflammatory agents postoperatively.

**F-086**

**THE IMPACT OF PERCEIVED PATIENT SATISFACTION: A COMPARATIVE ANALYSIS BETWEEN TWO THORACIC SURGICAL CENTERS**

C. Pomplili1, A. Brunelli2, G. Roccol3, R. Salvi2, F. Xiuml1, A. La Rocca2, N. Martuccio2, A. Sabbatini1

1Ospedali Riuniti Ancona, Ancona, Italy; 2National Cancer Center Pascale Foundation, Naples, Italy

Objectives: The objective of this investigation was to compare the levels of satisfaction of patients submitted to lung resection in two different thoracic surgical units.

Methods: Prospective analysis of 280 consecutive patients submitted to pulmonary resections for neoplastic disease in two centers (center A: 139 patients; center B: 141 patients) (2009-2010). Although the two centers are dedicated general thoracic units with qualified surgeons, dedicated personnel and similar perioperative pathways of care, they differ in internal staff organizations and catchment areas endowed with heterogeneous socioeconomic profiles.

Patients’ satisfaction was assessed at discharge through the EORTC-InFrotSat12 module, a 32-item self-administered anonymous questionnaire including multiple scales related to different aspects of care (doctors, nurses, other personnel, waiting time for tests, access, comfort, exchange of information and general satisfaction). Each scale (range: 0-100) was compared between the two units. Multivariable regression and bootstrap were used to verify factors associated with the patients’ general satisfaction (dependent variable).

Results: The risk-adjusted (ESTS risk model) mortality rates in the two units were similar (1.8% vs. 2.1%, P=0.8). Patients of unit B reported a higher general patients’ satisfaction (95.1% vs. 85.1, P=0.04), mainly due to a significantly higher satisfaction in the doctors-related scales (doctors technical skill - P=0.001, doctors interpersonal skill - P=0.008, doctors availability - P=0.005, doctors information provision - P=0.0006). Multivariable regression analysis and bootstrap confirmed that care in unit B (P=0.006, bootstrap frequency 60%) along with a lower level of education (P=0.02, bootstrap frequency 62%) were independent factors associated with a higher general patients satisfaction.

Conclusions: Patients’ satisfaction appears unrelated to clinical indicators of quality (i.e. mortality), warranting its inclusion in composite performance scores. A reduced level of patients’ satisfaction should drive changes in management policy of individual units in order to meet patients’ expectations and improve organizational efficiency.

**F-087**

**REPLACEMENT OF AUTOFLAPS WITH REVASCULARIZATION USING MICROSURGICAL TECHNIQUES IN MANAGEMENT OF EXTENSIVE DEFECTS OF TRACHEA: LESSONS LEARNED**

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Objectives: Now there is a set of publications devoted to surgical treatment of cicatrical stenoses of a trachea, however, liquidation of extensive window defects of the trachea arising after excising of its wall, remains a difficult
problem even to this day. To develop a technique allowing to liquidate window tracheal defects of almost any sizes by single-step procedure.

Methods: Fifty-one patients with extensive tracheal defects were managed using microsurgical technologies for elimination defect. From them, in 35 cases it was used dermo-osteal radial flap with revascularization, in 16 cases the dermo-cartilaginous autograft and in one dero flap. The flap plasty was finishing of stages of reconstructively-plastic interventions. In total 51 patients before its carrying out 118 operations on formation of a lumen of a trachea have been executed. Operation was made simultaneously by team of thoracic and microsurgeons. The equipmen of a time endoprosthesis carried out under endoscopic control. An endoprosthesis deleted after performance of operations on different terms.

Results: All 51 patients were discharged. The maximum term of observation makes 12 years. In one case there was no disturbance of a circulation of a graft and, as consequence of a good revascularization of tissues, its pyesis. Conclusions: Elimination of extensive defects of a trachea with the use of microsurgical complexes of autogenous tissues with revascularization is a new intervention technology in reconstructive surgery of a trachea, allowing to liquidate large window defect by one-step procedure.

F-088 HIGH EMERGENCY WAITING LIST FOR LUNG TRANSPLANTATION: EARLY RESULTS OF A SINGLE CENTRE EXPERIENCE
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Objectives: Death on the waiting list still is a matter of concern (16% in 2004 in France) and has led the French transplantation authorities to set up a dedicated emergent procedure, so-called high emergency waiting list (HEWL) in 2005, giving priority after an expertise process, to selected patients registered on the regular waiting list (RWL) and presenting with an acute respiratory failure. Methods: From January 2005 to December 2010, 188 patients were listed on the RWL. 22 died (11.7%), 118 were transplanted with an overall 14% 90-day mortality rate, and 19 were switched to the HEWL. Among them, seven had required ECMO and 12 invasive mechanical ventilation, and 17 received a lung graft. Population characteristics, morbidity, mortality and survival rates were investigated.

Results: Median age was 26 years (18-52). Indications for LTx were cystic fibrosis in 11 patients, COPD in 3, idiopathic pulmonary disease fibrosis in 3 and redo LTx in 2. Two patients died of multorgan failure on the HEWL. Median waiting time on the HEWL for the transplanted patients was five days. One intraoperative death occurred (disseminated intravascular coagulation). Eleven patients required ECMO support during the postoperative period. Eight were weaned. Bleeding complications occurred in nine patients (56%), all under ECMO. Haemodialysis was necessary for eight patients (50%) among whom seven ECMO patients. Overall 90-day and 18-month survival rates were 52% and 42%, respectively.

Conclusions: The observed mortality on the waiting list could have been doubled in the absence of the HEWL procedure. This apparent benefit was strongly associated with survival from NCCLC ($P<0.05$) and ILP alone ($P=0.05$). Also, low-dose PDT was selective for tumors and did not enhance drug distribution in the lung tissues.

F-090 FALSE POSITIVITY OF MEDIASTINAL LYMPH NODES HAS NEGATIVE EFFECT ON SURVIVAL IN SURGICALLY STAGED OR RESECTED NON-SMALL CELL LUNG CANCER
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Objectives: It has been shown that increased metabolic activity of primary tumor has a negative effect on survival in non-small cell lung cancer (NSCLC) staged with positron emission tomography integrated computed tomography (PET/CT). We hypothesized that an increased metabolic activity of mediastinal lymph nodes would have worse survival even if it is false. Methods: Consecutive 328 patients with NSCLC history were imaged with PET/CT within 90 days before surgery between September 2005 and March 2009. Patients who had neoadjuvant chemotherapy (n=22), patients with previous history of NSCLC (n=9) or other malignancies in past five years (n=11) were excluded from the study. Patients with negative mediastinoscopy underwent resection. Pathological results were revised according to the seventh TMM staging system. Kaplan-Meier test was used for survival. Log-rank and Cox analyses were used for comparisons.

Results: A total of 286 patients (262 male; mean age: 58.5 years) were evaluated. There were 22 (6.7%) operative deaths and two patients (0.6%) were lost to follow-up. The median follow-up in the remaining 262 patients was 26 months (range, 2-61 months). Tumor size, nodal spread and stage were all strongly associated with survival from NSCLC (P<0.001). There were 63 true positive, 65 false-positive (FP), 152 true-negative (TN) and six false-negative findings in mediastinal staging with PET/CT. After excluding n2 positive patients, TN patients had better survival than FP patients (P=0.007). There were 146 patients with pT1-p, pN0 treated by R0 surgical resection. Disease-free survival and overall survival was also significantly better for TN patients in completely resected group (P=0.017 vs. 0.016).

Conclusions: We have shown that false positivity of mediastinal lymph nodes had yielded worst survival in surgically staged or resected NSCLC patients staged with PET/CT. This result may help to allocate patients with potentially poor prognosis for considered additional therapy.

F-089 PHOTOODYNAMIC THERAPY ENHANCES THE DISTRIBUTION OF LIPOSOMAL DOXORUBICIN IN TUMORS DURING ISOLED LUNG PERFUSION
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Objectives: Photodynamic therapy (PDT), at low drug-light conditions, can enhance the effective permeability of the tumor vasculature to macro-

F-091 COMPARATIVE STUDY BETWEEN SCOT-15® AND PERFADEX® AS LUNG PRESERVATION SOLUTIONS
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Objectives: SCOT-15® is a low K+ preservation solution including polyethylene glycol (PEG) as a colloid for protection of vascular endothelium during
cold ischemia. Besides, PEG was demonstrated to have ‘immunocamouflage’ properties. SCOT-15<sup>9</sup> is already clinically used for kidney, pancreas and liver preservation. The aim of this study was to assess the properties of SCOT-15<sup>9</sup> for lung preservation in comparison with Perfadex<sup>®</sup> as a golden standard solution.

**Methods**: Two groups with six pigs each were compared. After PEG, lung function was then assessed during 45 min in an ex vivo lung perfusion and ventilation model with Steen<sup>®</sup> solution and 50% inspired oxygen. Pulmonary artery flow and pressure were recorded to calculate pulmonary vascular resistance (PVR). Mean airway pressure (mAwP) was monitored as a surrogate for lung compliance. Blood gases were taken at 15-min intervals on the perfusion outflow line to measure partial oxygen pressure (PO<sub>2</sub>), wet-to-dry weight ratio (W/D) was recorded as a marker of lung edema. Results: PVR was significantly lower in [S] compared to [P] (846±70 vs. 2063±633 Dynes.cm<sup>-5</sup>, P<0.04). There were no differences in PO<sub>2</sub>, (232±24 vs. 258±18 mm Hg; P=0.13), mAwP (6.3±1.2 vs. 7.3±0.4 mm Hg; P=0.24), and W/D (3.6±0.6 vs. 4.2±0.4; P=0.06) between [S] vs. [P], respectively.

Conclusions: Lungs preserved for 4 h with SCOT-15 have a lower vascular resistance with comparable oxygenation capacity and compliance. Higher flows do not lead to edema formation reflecting well preserved endothelial function. Further experiments with longer cold ischemia are needed to confirm the clinical relevance of this new solution.

**F-092**

**EXTENDED CERVICAL MEDIASTINOSCOPY: MATURE RESULTS OF A CLINICAL PROTOCOL FOR STAGING BRONCHOGENIC CARCINOMA OF THE LEFT LUNG**

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**Objectives**: To evaluate the accuracy of extended cervical mediastinoscopy (ECM) in the staging of bronchogenic carcinoma (BC) of the left lung based on our updated experience.

**Methods**: From 1998 to 2003, 89 patients underwent routine ECM for staging of BC of the left lung. In 2004, routine positron emission tomography (PET) was included in our staging protocol and ECM was reserved for those with positive mediastinal or hilar PET images, large lymph nodes on CT-scan or central tumours. Following this protocol, from 2004 to 2010, we performed 132 selective ECM. ECM was considered positive when metastatic nodes or tumour involvement directly in the subaortic or paraaortic regions was confirmed pathologically. Patients with negative ECM underwent subsequent thoracotomy for tumour resection and systematic nodal dissection (SND).

**Results**: Two hundred and twenty-one ECM were performed from 1998 to 2010 (89 routine and 132 selective). In the routine ECM protocol, four cases were positive and thoracotomy was contraindicated. The remaining 85 patients were operated and five had nodal disease in subaortic (LNS) or paraaortic (L6) stations. In the selective ECM protocol (n=188), 132 patients underwent ECM and in 19 it was positive; the remaining 113 patients underwent thoracotomy and SND. Among these, 56 patients underwent direct thoracotomy and four had positive LNS or L6. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of ECM were 0.67, 1, 0.94 and 0.95, respectively. The staging values of routine/selective ECM protocols were: 0.44/0.65, 1/1, 0.94/0.95 and 0.94/0.95, respectively.

Conclusions: Selective ECM protocol according to CT and PET findings has high negative predictive value and accuracy. Therefore, its selective use is recommended because it saves around 30% ECM without decreasing staging values of the current protocol.

**F-093**

**SIGNIFICANCE OF A NEW FDG-POSITIVE LESION ON RESTAGING PET/CT AFTER INDUCTION THERAPY FOR NSCLC**

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**Objectives**: Restaging of patients with locally-advanced NSCLC is of paramount importance, since only patients with down staging after induction therapy will benefit from surgery. In this study, we assessed the etiology of new FDG-positive focal abnormalities on restaging PET/CT in patients with a good response after induction chemotherapy in the primary tumor and lymph nodes. **Methods**: Between 2004 and 2008, 31 patients with histological proven stage III NSCLC had a PET/CT prior and after induction chemotherapy. Their medical charts were retrospectively reviewed. **Results**: Restaging PET/CT revealed a new FDG-positive lesion in 6/31 (19.4%) patients. Initial clinical stage of the disease was IIIA N2 in 4 and IIIB T4 in 2 patients. The maximal standard uptake value (SUVMax) in the primary tumor (P=0.043) and in the initially involved mediastinal nodes (P=0.068) decreased after induction treatment in all patients. The new PET/CT findings were located in an ipsilateral cervical in 2, a contralateral mediastinal in 1 and an ipsilateral mammary internal lymph node in 1 patients. Two other patients had a lesion on the contralateral lung. Malignant lymph node infiltrations were excluded following fine-needle puncture, intraoperative biopsy or follow-up PET/CT. Contralateral pulmonary lesions were diagnosed as benign following mini thoracotomy and pulmonary wedge resection.

Conclusions: New lymph node or contralateral pulmonary solitary FDG-positive lesions on restaging PET/CT following induction chemotherapy in good-responding patients to chemotherapy for NSCLC are not rare. In our experience, these lesions were not associated with malignancy but histological/cytological examination should be performed before surgery.

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**Session VIII - Pulmonary Non-Neoplastic Monday, 6 June 2011 16:00-17:30**

**O-094**

**THE RISK IS NOT OUR BUSINESS: SAFETY OF SURGERY IN PATIENTS WITH ANTI-PLATELET THERAPY**

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**Objectives**: Recommendations of AHA changed preoperative management of patients in anti-platelet therapy (APT). We assessed surgery outcomes in patients taking APT.

**Methods**: Prospective study of consecutive series of patients taking APT, who underwent thoracic surgery. Using propensity score-matching methods, patients were matched (ratio 1:4) with patients not-receiving APT at time of surgery. Logistic regression analysis was used to identify covariates among baseline patient-variables imbalanced. Resulting-matched patients were analyzed for differences in intraoperative and postoperative outcomes. χ<sup>2</sup> and Fisher’s test were used to calculate probability value for dichotomous variables comparison. Statistical analysis was performed using Wolphram Mathematica 8.0.

**Results**: Thirty-eight patients receiving APT at time of surgery (2008-2010) were matched with 141 patients not-receiving APT. None of patients required reoperation for bleeding. Two patients received blood transfusion. Chest-tube drainage amount was not statistically significant different. There were not statistically significant differences between outcomes for patients receiving APT compared with controls for operative time, hospital length-of-stay, blood losses, or morbidity (stratified by procedure).

Conclusions: Thoracic surgery can be safely performed in patients receiving APT.

**O-095**

**AGGREGATE RISK SCORE FOR PREDICTING MORTALITY AFTER SURGICAL LUNG BIOPSY FOR INTERSTITIAL LUNG DISEASE**

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**Objectives**: Develop a generalizable and practical risk score for 90-day mortality following surgical lung biopsy (SLB) for interstitial lung disease (ILD).

**Methods**: Three hundred and eleven consecutive patients undergoing SLB for ILD in a single center were reviewed retrospectively (2002-2009).
Preoperative variables were initially screened for possible association with 90-day postoperative mortality by univariate analysis. Variables with a P<0.1 were used as independent predictors in a stepwise logistic regression analysis. The significant predictors were used to build the risk score. A threshold effect was sought for significant numeric variables by using ROC analysis. The scoring system was built by proportionally weighting the regression coefficients. The score for each patient was the sum of the individual factors.

Results: Thirty-day and 90-day mortality rates were 9% and 10.6%, respectively. Independent predictors significantly associated with 90-day mortality were: age >67, P=0.0001; preoperative ICU admission, P=0.006; immunosuppressive treatment, P=0.004; open surgery, P=0.03. Accordingly, the following coefficients were assigned: open surgery-1, immunosuppressive treatment-1.5, age >67-2, preoperative ICU-2. Individual scores varied from 0 to 6 points. Patients were grouped into 4 classes (A-D) showing incremental risk of 90-day mortality. Those patients with an aggregate score of 0 (Class A) had a 90-day mortality of 2% whereas this was 86% with a score >3 (Class D).

Conclusions: SLB for presumed ILD has considerable risk with overall 90-day mortality around 10%. The ILD aggregate risk score developed in this study is a useful and easily applied tool for quantifying the risk of death after SLB and allows for better risk/benefit stratification prior to SLB.

O-096
IMPACT OF THE LEARNING CURVE IN THE USE OF A NOVEL ELECTRONIC CHEST DRAINAGE SYSTEM AFTER PULMONARY LOBECTOMY: A CASE-MATCHED ANALYSIS ON THE DURATION OF CHEST TUBES
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Objectives: The objective of this investigation was to verify the impact of the learning curve on the chest tube duration after the introduction of a novel electronic chest drainage device following pulmonary lobectomy.

Methods: Propensity score case-matched analysis comparing the first consecutive 51 lobectomy patients managed with a novel electronic chest drainage unit with 51 counterparts managed with a traditional device. Exclusion criteria: air leak >7 days, chest tube duration >10 days, hospital stay >14 days, ICU stay, chest wall resection, reoperation. Population: Fifty-one patients managed with electronic chest drainage system (E), 235 patients managed with traditional system (T). Analysis: Several surgical and perioperative variables were used to construct the propensity score used to match the 51 E patients with 51 T counterparts. The two matched groups were compared in terms of chest tube duration and hospital stay. A curve was then generated by plotting the duration of chest tubes of the two matched groups, with the patients ordered by date of operation.

Results: Baseline and perioperative characteristics of the two matched groups were not different. Group E patients had a shorter chest tube duration (2.5 days vs. 4.4 days, P=0.0001) and hospital stay (4.5 days vs. 6 days, P=0.0003), and reduced hospital costs (£1802 vs. £2553, P=0.0002). Compared to group T, patients of group E had a consistent shorter duration of chest tube since the very first cases. The curve sloped down for the first 40 patients before reaching a plateau, when the maximum benefit of the electronic device was evident.

Conclusions: Compared to traditional devices, the use of a novel electronic chest drainage system was beneficial since its initial application. The inherent learning curve was short and did not affect the efficiency of the system.

O-097
THE IMPACT OF CHEST TUBE REMOVAL ON PAIN AND PULMONARY FUNCTION AFTER PULMONARY RESECTION
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Objectives: To assess the immediate influence of chest tube removal on chest pain and FEV1, after pulmonary resection.

Methods: Prospective longitudinal investigation on 104 consecutive patients (53 wedge/segmentectomies and 51 lobectomies; 69 muscle and nerve-sparing lateral thoracotomy and 35 VATS). Postoperative chest pain was controlled in all patients by a standardized combination of oral and intravenous non-opioid analgesics. All patients had one chest tube (24 French). Static and dynamic (after forced expiratory effort) pain and FEV1 were assessed before and 1 h after chest tube removal by the same operator. No additional analgesics were administered before or after chest tube removal. Pain level was assessed by the numeric pain scale (range: 0 = no pain to 10: excruciating pain). FEV1 was assessed by a portable spirometer. Bronchodilators were not used in these patients. Pre-removal and post-removal measurements were compared by the Wilcoxon signed rank test.

Results: The average pre-removal static and dynamic pain scores were 2.6 and 4.1, respectively. The static and dynamic pain scores decreased by 42% and 41%, respectively, after tube removal (P<0.0001). The average FEV1 before chest tube removal was 1.5 l or 53% of predicted value and increased by 13% after tube removal (P<0.0004). Fifty-six percent and 78% of patients reported static and dynamic pain scores improvement, and 67% a FEV1 improvement after chest tube removal. Similar results were observed in patients operated on through VATS or thoracotomy. Compared to patients whose chest tube was removed later, those who had their chest tube removed before POD3 showed a greater reduction in static pain score (41% vs. 31%, P=0.05) and greater improvement in FEV1, (18% vs. 0.01%, P=0.02).

Conclusions: Removing a chest tube reduces pain and improves ventilatory function, independent of surgical access and particularly in the early post-operative phase. A fast track chest tube removal policy may favor patients’ recovery.

O-098
GASTROPARESIS IS A CONTRIBUTING FACTOR TO PNEUMONIA AFTER PULMONARY RESECTION
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Objectives: There are few data in the literature concerning relations between thoracic surgery and digestive motility. The aim of our study was two-fold: 1) showing a link between thoracic surgery and gastric distension and, 2) between post operative pneumonias and gastric distension.

Methods: A retrospective analysis was conducted on 262 patients who had undergone a thoracotomy between January and December 2007. The transverse diameter of the stomach was measured on chest X-rays performed on day 0, and on day 1. Gastric distension was defined as a ratio (R) D1/D0 higher than 1.3 (minimum: 0.5; maximum: 4.1). Three groups were defined: group 1 (absence of distension) R inferior to 1.3; group 2 (moderate distension) R between 1.3 and 2.3; group 3 (major distension) R superior to 2.3. International criteria of Center of Disease Control were used to define pneumonia. Appropriate statistics test were used.

Results: There were 73 female (27.8%) and 189 men (72.1%), age ranging from 20 to 83 years (average: 59.9 years old). As for gastric distension, 194 patients (74%) constituted group 1, 53 (20.2%) group 2 and 15 (5.7%) group 3. Pneumonectomy significantly increased the incidence of gastric distension on day 1 (P=0.03). The side, the type of mediastinal lymphadenectomy, a personal medical past history of upper gastro-intestinal tract surgery had no statistically significant influence on the incidence of gastric distension. Patients with gastric distension on D1 had significantly more infectious pneumonia on day 5 (P=0.01): 16 (8.2%) patients in group 1, 14 (26.4%) in group 2 and 7 (46.6%) in group 3. On Day 5, 20.8% (n=5) of pneumonectomies had pneumonia, against 5.7% (n=13) of patients who had undergone another type of surgery (P=0.01).

Conclusions: We established in our cohort of patients a link between type of thoracic surgery (pneumonectomy), gastric distension on day 1 and infectious pneumonia on day 5. A prospective multicenter study is desirable to verify these data.

O-099
ECHOCARDIOGRAPHIC ASSESSMENT PREDICTS THE ONSET OF ATRIAL FIBRILLATION AFTER MAJOR PULMONARY RESECTIONS
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Objectives: Atrial fibrillation (AF) is one of the most frequent complications after major pulmonary resections. Notwithstanding prevention and early treatment, AF may show a negative impact on outcome. We investigated...
Abstracts/Interactive CardioVascular and Thoracic Surgery

Session IX - Experimental + Innovative
Monday, 6 June 2011
16:00-17:30

F-100 FIRST TIME IDENTIFICATION OF CIRCULATING TUMOR CELLS IN MURINE MODELS OF HUMAN NON-SMALL CELL LUNG CANCER

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Objectives: Circulating tumor cells (CTCs) have been found in up to 40% of patients with either localized or metastatic non-small cell lung cancer (NSCLC). However, level of CTCs has never been established in preclinical murine models of human NSCLC. We sought to determine the levels of CTCs in subcutaneous and orthotopic murine models of human non-small cell lung cancer.

Methods: We used athymic nude mice and luciferase-positive AS49 lung adenocarcinoma cell line (AS49-luc, Xenogen Corp, USA). In group 1, animals underwent subcutaneous injection of cells in both flank (n=6). In group 2, animals underwent general anesthesia, chest wall incision, and transpleural injection of cells in the parenchyma of the left lung (n=15). After 2 weeks, bioluminescent in vivo imaging (IVIS) was performed after iv intra peritoneal injection of luciferine, and xenograft implantation rates were calculated. During the third week, tumor-bearing animals were anesthetized, 1-ml venous blood was punctured from the cavernous sinus, mixed with 7-ml of healthy human blood, and tested using the Cellsearch assay (Veridex LLC, USA). Animals were then humanely killed.

Results: Xenograft implantation rates were 100% in group 1 (n=6) and 60% (n=9) in group 2. Among the six blood tubes collected from the first group, none were clotted, six tubes underwent successful Cellsearch assay, and five assays were positive for CTCs detection (CTCs level range 2-5, mean 2.5, S.D. 1.76). Among the nine blood tubes collected from the second group, three tubes were clotted and impossible to analyze, six tubes underwent successful Cellsearch assay, and five assays were positive for CTCs detection (CTCs level range 2-21, mean 9.5, S.D. 9.35). When comparing groups, the difference in CTC levels show a trend toward statistical significance (Student test, P=0.058).

Conclusions: Two weeks after tumor implantation, CTCs are detected in 83% of nude mice bearing either subcutaneous or orthotopic NSCLC tumors. Evolution of CTCs level after cells injection should be established, but this model could be of interest to study oncogenesis and to assess new treatments.

F-101 CD26 - INHIBITION RECRUITS REGENERATIVE STEM CELLS VIA SDF-1 - CXCR4 AXIS AND IMPROVES ISCHEMIA-REPERFUSION INJURY IN THE MOUSE MODEL OF LUNG TRANSPLANTATION

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Objectives: The CD26 antigen is a transmembrane glycoprotein that is constitutively expressed on activated lymphocytes and in pulmonary parenchyma. This molecule possesses a catalytic domain (dipeptidyl peptidase IV, DPP4) that cleaves a host of key biologically active peptides. Here, we aimed to identify an important substrate of CD26/DPP 4 - stromal cell-derived factor 1 (SDF-1) - which functions as a key modulator for stem cell homing together with its receptor CXCR4 in response to injury.

Methods: Orthoptic single lung transplantation (Tx) was performed between syngeneic C57BL/6 mice. Inhibition of CD26/DPP 4 in recipients was achieved using vildagliptin (10 mg/kg/day) sc., 6 h ischemia time was applied to induce ischemia-reperfusion (I/R) prior to implantation. Histology, ELISA for SDF-1, and fluorescent activated cell sorting for its receptor CXCR4, and for markers of regenerative progenitor cells were assessed in Tx lungs and upon inhibition of CD26/DPP 4.

Results: Compared to untreated Tx grafts, systemic CD26/DPP IV inhibition of Tx grafts resulted in an increase of protein concentrations of SDF-1 in plasma (1347 vs. 1176 mg/ml), lung (740 vs. 611 mg/mg) and spleen (1726 vs. 1549 mg/mg). Concordantly, the fluorescence intensity of CXCR4 rose in blood circulation (46.9 vs. 24.3) and in the lung (74.4 vs. 60.2) when compared to WT. Furthermore, CD34 and the regenerative stem cell marker c-kit showed an enhancement of fluorescent intensity in CD26/DPP IV-inhibited plasma and transplants. Histology and immunohistochemistry of inhibited grafts revealed less recruitment of immune cells when compared to transplanted lungs alone.

Conclusions: Decreased degradation and enhancing of the SDF-1 - CXCR4 axis through CD26/DPP IV inhibition increased progenitor cells capable for recovering of the I/R lung injury. Stabilization of endogenous SDF-1 is achievable and may be a promising strategy to intensify sequestration of regenerative stem cells thus emerging as a novel therapeutic concept.
Abstracts/Interactive CardioVascular and Thoracic Surgery

F-103 PERCUTANEOUS RADIOFREQUENCY SYMPATHICOLOBYSIS IN SEVERE HYPERHIDROSIS AND FACIAL BLUSHING: EFFICACY AND QUALITY OF LIFE
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Objectives: Hyperhidrosis (Hh) and facial blushing (Fb) are conditions caused by hyperactivity of the sympathetic system that affect around 2% of the population. Severe cases have been typically treated with thoracic sympathectomy through a minimally-invasive approach. We sought to determine if severe body temperature, respiratory rate, oral intake, daily performance, and general anaesthesia could benefit from receiving percutaneous radiofrequency ablation of the sympathetic chain.

Methods: Prospectively collected data obtained from May 2007 to May 2010 were analysed to compare the treatment efficacy and effects on quality of life of the two procedures.

Results: From a total of 58 patients enrolled in the study, 31 were treated with radiofrequency procedures while 27 received surgical sympathectomy. Patients with Hh had better results with surgery than with radiofrequency sympathicolysis in terms of efficacy (P<0.0001) and quality of life (P=0.0002). However, there was still a significant improvement in quality of life in the group of patients treated with radiofrequency sympathicolysis (P=0.004). Patients with Fb had good results with surgical procedures and poor outcomes with radiofrequency ablation, resulting in significant differences in treatment efficacy (P=0.005) and in quality of life (P=0.003). Fb patients treated with radiofrequency procedures had no improvement in quality of life after the intervention (P=0.28).

Conclusions: Our results support the view of surgical sympathectomy as the gold-standard treatment in severe cases of Hh and Fb. Radiofrequency sympathicolysis is useful as a second treatment choice for Hh patients. Fb patients do not benefit from radiofrequency sympathicolysis.

F-104 ENDOSCOPIC TRANSORAL SURGICAL LUNG BIOPSY IN THE DOG
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Objectives: Natural orifice transluminal endoscopic surgery (NOTES) remains a controversial approach during intra-abdominal and intrathoracic surgery. Methods: To evaluate the feasibility of natural orifice surgical biopsy in thoracic surgery, we performed transoral (via an incision over the thyroid isthmus) surgical lung biopsy on 20 dogs. We also investigated the effectiveness of different antibiotic regimens [single dose cefazoline (20 mg/kg, n=10) vs. 3-day course of cefazime (20 mg/kg per day, n=10)] to prevent postoperative infection in transoral surgical lung biopsy. We had recorded and analyzed rectal and oral temperature, respiratory rate, oral intake, daily performance, and white blood cell count in all animals before operation and after 1, 2, 3, 7, and 14 days after operation.

Results: No intraoperative and postoperative complications were noted. Transoral surgical lung biopsy was successful in 17 dogs. In 3 dogs, the lingula of the left upper lobe was misinterpreted as the left lower lobe. With regard to the optimum duration of prophylactic antibiotic for preventing postoperative infection, there were no differences in clinical signs and hematological reactions between the two regimens. 2 weeks after surgery.

Conclusions: Surgical lung biopsy by NOTES is a feasible and safe procedure. The data also show that both single dose and 3-day course of antibiotic was effective in preventing potential infection after NOTES. We believe that this novel technique will open a new frontier for the minimally-invasive approaches for thoracic surgery.

F-105 CONSERVATIVE DRAIN REMOVAL PROTOCOL DOES NOT FAVOR DIGITAL CHEST DRAINAGE AFTER LOBECTOMY: MULTICENTER RANDOMIZED TRIAL
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Objectives: Recently, implemented to daily clinical routine advanced digital thoracic drainage systems still need feasibility studies. Spectrum of used drainage systems is wide. This study compares Thopaz Medela® drainage system with traditional glass bottle drainage after major pulmonary resections. Methods: Between January 2010 and January 2011 126 patients subjected to lobectomy were enrolled in the three study centers in Poland. Patients after signing informed consent were randomly allocated to one of the two study arms. In group I Thopaz Medela® drainage system was applied, while patients in group II were subjected for the drainage with traditional glass bottle system. The drain was removed when the air leak was <20 ml/min in group I and there were no air bubbles in group II and <20 ml of exudate production per day. Patients in group II were submitted to suction on first two postoperative days in contrast to patients in group I who were submitted to constant suction of ~15 cm H2O. The study was approved by Regional Ethic Committees.

Results: Seven patients were excluded from the study, all from group I. Four patients due to resection other than lobectomy and three due to surgeon decision. One patient in group I died in the postoperative period due to ileus. Patients in both study groups did not differ in terms of demographics and performance status.

Conclusions: Conservative drain removal protocol does not favor digital chest drainage. Constant suction could prolong postoperative hospital stay. Thopaz Medela® is at least as safe as traditional glass bottle drainage.

F-106 ROBOTIC LUNG ANATOMICAL SEGMENTECTOMY: TECHNICAL ASPECTS AND INITIAL RESULTS
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Objectives: Robotic lobectomy with radical lymph node dissection is the new frontier of minimally-invasive thoracic surgery. Series of sublobar anatomical resections for primary lung cancers or for metastasis employing video-assisted thoracic surgery (VATS) have been reported, but no cases have been so far reported using the robot assisted approach. We present the technique and surgical outcome of our initial experience.

Methods: Clinical data of patients undergoing robotic lung anatomical segmentectomy were retrospectively reviewed. All cases were done using the Da Vinci System. A 3-incision strategy with a 3 cm utility incision in the anterior 4th or 5th intercostal space and two or three additional ports was performed. Individual ligature and division of the hilar structures was performed using hemolock or mechanical endoscopic staplers. The parenchyma was transected with endovascular staplers mainly through the utility incision. Systematic mediastinal lymph node dissection or sampling was performed.

Results: From 2008 and 2010 17 patients underwent a robot-assisted lung anatomical segmentectomy in two centres. There were 10 female and 7 males with mean age of 59 years (range 35-81). Mean duration of surgery was 189 min. There were no major intraoperative complications. Conversion to open procedure was never required. Postoperative morbidity rate was 17.6% with pneumonia in one case and prolonged air leak in two patients. Median postoperative stay was 5 days (range 2-14), and postoperative mortality was 0%. Final pathology was non-small cell lung cancer in 9 patients, typical carcinoïd in 1 and lung metastases in 7.

Conclusions: Robotic anatomic lung segmentectomy is a feasible and safe procedure. A robotic system that offers improved ergonomic, three dimensional view and precise movements may make minimally-invasive segmentectomy easier to adopt and perform.
F-107
NEW SCOPE FOR THORACIC SURGEONS - INDIVIDUAL ADAPTED CHEMOTHERAPY OF NSCLC BY LYMPH NODE BIOPSY?
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Objectives: Expression levels of ERCC1 and RRM1 in the primary tumor of NSCLC are well-examined predictive parameters for the response of platin-based chemotherapy. Analyzing and comparing the expression levels of ERCC1 and RRM1 in the primary tumor to the associated lymph node metastasis is the aim of this study, as their heterogeneity would lead to important decisions in further therapies of the NSCLC.

Methods: Tissues of the primary tumor and associated lymph node metastasis were microdissected from formalin-fixed, paraffin-embedded material of 12 NSCLC. Thereafter RNA was isolated and preamplified for analyzing the relative expression levels of ERCC1 and RRM1 with reference to Pol lla and β-GUS by RT-PCR.

Results: The relative expression levels with a median DDct are 0.59 (range 1.23-0.11) for the primary tumor and 0.42 (range 1.20-0.27) for the associated lymph node metastasis for ERCC1. Median DDct for RRM1 is 0.69 (range 1.08-0.45) for the primary tumor and 0.625 (range 1.74-0.27) for the lymph node metastasis. A positive correlation between the primary tumor and the associated lymph node metastasis was generated for both enzymes (r=0.81) and could be assured by analyzing the clinical data.

Conclusions: Based on the correlation of the expression levels of the primary tumor to the associated lymph node metastasis, the lymph node biopsy might be a new pivotal approach for the individual therapy decision of the NSCLC. Furthermore, a biopsy of the primary tumor and the lymph node metastasis might be done in course of an ineffective platin-based chemotherapy.

F-108
USING TRACHEAL SEGMENTS FOR REPLACEMENT OF CERVICAL ESOPHAGUS: AN EXPERIMENTAL STUDY
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Objectives: Segmental resection and anastomosis of esophageal lesions are not performed as a routine clinical practice because of complications and associated problems, while tracheal resection and anastomosis is a routine clinical practice. In this experimental study we resected a segment of cervical esophagus and replaced it with a tracheal segment.

Methods: In 8 dogs (mixed races), weighing 20-30 kg, aged 1-2 years, through a cervical incision and under general anesthesia, a cervical incision 5 cm of cervical trachea was separated while preserving its attachments to surrounding fibroareolar tissues. Afterwards, 5 cm of esophagus was resected and replaced with a prepared segment of trachea. Oral liquids started at the first postoperative day; the animals were kept for 2 months then euthanized. Quality of swallowing, and voice was evaluated. After an autopsy, anastomoses were examined grossly and histopathologically.

Results: No complications occurred during surgery. Swallowing function and voice were normal in all eight dogs after the operation. No sign of aspiration was seen in clinical and radiographic examinations after starting oral diet. In autopsy examination, anastomoses were patent without narrowing or abnormal mucosal changes. Remarkable histopathologic findings in replaced tracheal segment were: squamous metaplasia, atrophy and degeneration of mucosal glands and degeneration of cartilages.

Conclusions: Replacement of a segment of the esophagus with an autogenous tracheal segment is a practical procedure with low complications and can probably be used for the treatment of cervical esophageal lesions in human beings.

Ad Hoc Committee Women in Thoracic Surgery
Session
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A LATE RIGHT CATAMENIAL PNEUMOTHORAX WITH PARTIAL LIVER HERNIATION
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Objectives: In literature several case reports and case series about catamenial pneumothorax have been reported, with very different clinical courses and surgical findings. Pathogenic theories are controversial, and there is no unique surgical treatment. This is why the treatment of catamenial pneumothorax is still debated.

Methods: A 43 years old woman had recurrent right pneumothorax associated with menses, in anamnesis dysmenorrhea under estro-progestinic therapy. The first episode occurred at 42 during menses, treated by pleural drainage. Chest X-ray showed diaphragmatic lesions, so she underwent CT and MRI. They showed partial liver herniation through diaphragmatic disruptions.

Results: The recurrence occurred two months later, so thoracoscopy was performed. It showed multiple diaphragmatic defects (diameter 2-3 cm) of the tendinous part with herniation of liver dome. Nether subpleural blebs nor pleural lesions were found. After biopsy of diaphragmatic lesions (liver at histopathology), partial pleurectomy and talcage on the diaphragm were performed. Preoperative CAT125 levels were normal. After six months occurred a right basal pneumothorax, in coincidence with changing of hormonal therapy. It was treated successfully by pleural drainage, talc slurry and another hormonal therapy. After 12 months no other recurrence occurred.

Conclusions: Few cases in literature report liver herniation through diaphragmatic lacerations in catamenial pneumothorax. Defects of the diaphragm and thoracic endometriosis were reported in 38% of patients. The implantation of endometriosis on the diaphragm, on thoracic or peritoneal side, lead to involution of the muscular fibres with creation of holes. The negative intratoracic pressure during years makes the liver herniate through the diaphragmatic defects and ingrowth into the thorax, as observed in this report. The surgical treatment of this lesion could be difficult, because it has the aim of no other recurrence without being too much demolitive. In addiction, the right hormonal therapy is essential.
P-110
VIDEO-ASSISTED THORACOSCOPIC MAJOR PULMONARY RESECTIONS IN ELDERLY PATIENTS
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Objectives: Advanced age is a known risk factor for postoperative complications after pulmonary resections. In this study we investigate the results of video-assisted thoracoscopic surgery (VATS) for major pulmonary resections in old patients (group B, >75 years) compared with younger patients (group A, <75 years).

Methods: A retrospective review was performed of all patients operated by VATS in our department between July 2007 and July 2007. We reviewed preoperative data and perioperative results, complications, length of stay, 60-day mortality and survival.

Results: Over the period studied, 200 patients underwent VATS anatomic resections (42 of these were >75 years old). The median follow-up time was 14.57 months (group A) and 17.47 months (group B). The actuarial survival rate was 88.3% (A) and 76.6% (B) at two years (P=0.312).

Conclusions: VATS major pulmonary resections in elderly patients are a safe procedure with good postoperative results similar to outcomes in younger patients. We consider advanced age not to be a contraindication for VATS lobectomy and we prefer anatomic resections rather than wedge resections according to the oncological criteria.

P-111
LASER ASSISTED PULMONARY METASTASECTOMY: EVALUATION OF PATIENT CHARACTERISTICS, SURGICAL APPROACH AND COMPLICATION RATE
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Objectives: Different techniques of pulmonary metastasectomy are described in literature. Laser resection permits limited excision of deep-seated lesions sparing lung tissue as much as possible. Our aim was to evaluate patient characteristics, surgical approach and complication rate of laser assisted resection in comparison to wedge and anatomical resections.

Methods: A pulmonary Metastasectomy Registry of all patients who underwent pulmonary metastasectomy in our center between January 2005 and May 2010 was assembled using administration database of patients operated for diagnosis of secondary malignant pulmonary disease (C78.0) according to international classification of disease (ICD-10). Patient characteristics, surgical report and complications were recorded from electronic patient files. The number of resected lesions was registered according to the histological characteristics.

Results: Three hundred patients were included for analysis. There were 132 female and 168 male patients (ratio 1/1.27). Age ranged from 11 to 85 years (mean 60 years, median 64 years, S.D. 14.6). In an increasing number of resected lesions was registered according to the histological characteristics. Patient characteristics, surgical approach and complication rate of laser assisted resection went pulmonary metastasectomy in our center between January 2005 and May 2010 was assembled using administration database of patients operated for diagnosis of secondary malignant pulmonary disease (C78.0) according to international classification of disease (ICD-10). Patient characteristics, surgical report and complications were recorded from electronic patient files. The number of resected lesions was registered according to the histological characteristics.

Conclusions: VATS major pulmonary resections in elderly patients are a safe procedure with good postoperative results similar to outcomes in younger patients. We consider advanced age not to be a contraindication for VATS lobectomy and we prefer anatomic resections rather than wedge resections according to the oncological criteria.

P-112
A PROPENSITY-MATCHED COMPARISON OF SURVIVAL AFTER LUNG RESECTION IN PATIENTS READMITTED TO INTENSIVE CARE VERSUS PATIENTS WITH NO READMISSION
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Objectives: Patients undergoing lung resection for cancer already suffer from several co-morbidities and may have impaired lung function. Readmission to intensive care unit (ICU) after initial recovery in these patients is not uncommon (5-9%). In this study, we aimed to compare the outcome and survival rates of these patients with patients who were not readmitted to ICU after lung resection for lung cancer.

Methods: We reviewed patient data for a 10-year period; a total of 1981 patients who had lung resection for lung cancer were included. Of these patients 131 (6.6%) were readmitted to ICU due to respiratory failure. For our analysis, we excluded all the cases that died in hospital. Logistic regression model was then used to develop a propensity score for readmission to the ICU and non-readmitted patients were matched to readmitted patients based on propensity score at a ratio of 3:1. We also used the Kaplan-Meier survival curves before and after matching for the patient characteristics, procedure, type and the stage of the cancer.

Results: Mortality rate was 29.7% (n=39) in readmitted group and only 0.4% (n=8) in the non-readmitted group (P<0.001). At three years the difference in the survival between the two groups was similar after matching, however after this time, patients who were readmitted showed a worse survival rate but this did not reach the statistical significance (P=0.07).

Conclusions: ICU readmission is associated with high in-hospital mortality. However, the patients who were readmitted to ICU after lung resection and survived this episode and were discharged home had the same rate of survival rates compared to their non-readmitted counterparts. We conclude that in patients with lung cancer undergoing lung resection, readmission to ICU is an independent factor affecting short-term, but not long-term survival.

P-113
PROGNOSTIC VALUE OF PROLIFERATION AND APOPTOTIC INDICES IN COMPLETELY RESECTED STAGE I NSCLC
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Objectives: To assess the significance of proliferative and apoptotic index (PI and AI) as prognostic factors after surgery for NSCLC.

Methods: A total of 147 patients who underwent surgery for previously untreated pathologic stage I NSCLC between 2000 and 2005 were reviewed. Only patients affected by adenocarcinoma and squamous cells tumors were considered. For each tumour the pathologist evaluated the proliferation index (PI), the apoptotic index (AI) and the turnover index (TI) expressed as 3xPI - AI. Patients were divided according with the median value of each index. Survival was also evaluated according: age, sex, T status, pleural infiltration, histology and grading.

Results: Between the 147 patients only 139 were considered for the study (3 lost at follow-up and 5 not tumour related dead). Age, sex, T status, histology, visceral pleural infiltration resulted not significant in affecting the survival. Also the 5-year survival rates according with MI, AI and TI were not significant (P=0.83, P=0.79 and P=0.62, respectively). The same index was then used in adenocarcinoma and squamous group separately. Despite no differences in 5-year survival were found among the squamous tumors, in the adenocarcinoma series a lower TI was significantly associated with a better 5-year survival (P=0.006) as well as the AI (P=0.033), but not for PI (P=0.091).

Conclusions: PI and the AI are often advocated as prognostic factors however without any strong evidence. Our results confirm that these indices and particularly the derived TI can be applied as prognostic indicator for the pulmonary adenocarcinomas confirming their different behaviour respect the squamous and stressing the importance of an histology tailored treatment.
IS RADICAL SYSTEMIC MEDIASTINAL LYMPHADENECTOMY JUSTIFIED IN ELDERLY LUNG CANCER PATIENTS?

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Objectives: The population is aging and the proportion of patients older than 75 years continues to increase. The therapeutic impact of a radical mediastinal lymphadenectomy (RLA) associated with a pulmonary resection for lung cancer remains controversial. Our objective is to investigate the impact of lymph node dissection on the overall survival for elderly lung cancer patients and assess whether the non-performance of an RLA could be justified in the surgical treatment for this group.

Methods: We analysed the records of 60 patients aged 75 years and older (41 males, 19 females) who underwent surgery for non-small-cell lung cancer. They were divided into two groups, according to the type of intraoperative mediastinal lymphadenectomy, the radical systematic lymphadenectomy (RLA group, n=36) and the non-radical lymphadenectomy (NLA group, n=24) groups. A Cox proportional hazards model and the Kaplan-Meier method were used for the survival analyses.

Results: RLA had no protective effect on mortality; the hazard ratio for the RLA group in comparison to the NLA group was 0.93 in the multivariate analysis. The 3-year survival for the NLA group, was marginally better than that of the RLA group. There was no significant difference in the overall survival between the two groups (P>0.05).

Conclusions: There was no survival benefit for RLA. Although in some reports a systematic mediastinal lymphadenectomy is recommended for correct staging, a pulmonary resection with non-performance of radical lymphadenectomy could be an acceptable surgical treatment for the increasing number of elderly lung cancer patients.

DE NOVO BRONCHIAL CANCER FOLLOWING KIDNEY TRANSPLANTATION

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Objectives: Chronic immunosuppression is associated with a higher cancer incidence. Bronchial cancer (BC) is associated with the highest mortality rate. Aim of this study was to evaluate incidence and outcome of patients developing BC following single or combined kidney-pancreas (or liver) transplantation.

Methods: Patients transplanted between 1996 and 2010 were analyzed retrospectively. Results: Among 1761 patients, 20 (five females) developed BC (1.1%). Sixteen patients had a kidney, three a simultaneous pancreas-kidney and one patient a simultaneous liver-kidney transplant. Median age at transplantation was 56 (range 39-65) years. In 12 patients maintenance immunosuppression consisted of calcineurin-based triple drug therapy. Pre-transplant chest X-rays were without abnormal findings. One patient denied smoking. Median interval from transplantation to tumor diagnosis was 57 (3-205) months. In 13 patients (65%), carcinomas were diagnosed at UCIC stage IV (1 SCLC) and received palliative or best supportive care. Among seven carcinomas diagnosed and curatively resected at UCIC stage I, three experienced complete response, two progressive disease and two died of postoperative complications.

Conclusions: Due to high incidence, late diagnosis and increased postoperative morbidity of de novo BC, special screening and therapeutic strategies as well as intensive educational training of transplanted patients with a smoking history should be considered.

THE ANALYSES OF FLUORODEOXYGLUCOSE (FDG)-PET MAXIMAL STANDARDIZED UPTAKE VALUES (SUV) OF SURGICALLY RESECTED ADENOCARCINOMA AND SQUAMOUS CARCINOMA

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Objectives: FDG PET/CT has been used to differentiate malignant solid lung nodules from benign nodules and to evaluate patients preoperatively. Although the prognostic role of SUVmax of 18-FDG-PET has been largely investigated, many issues regarding its relationship with major histological subtypes still remain controversial. We analysed the SUVmax values and specimen findings of resected adenocarcinoma (AC) and squamous cell carcinoma (SCC) patients.

Methods: Pathology and PET/CT reports of 60 NSCLC (34 SCC, 26 AC) patients who underwent a preoperative assessment and curative lung resection were reviewed. The SUVmax values for each histological subtype, along with SUVmax of tumor sizes, were compared using Spearman’s correlation test and Mann-Whitney U analyses. The optimal cut-off values for malignancy were calculated by use of the receiver-operating-characteristic (ROC) analysis. Results: The 34 patients with SC histology were found to have significantly greater preoperative SUVmax values than the 26 patients with AC (mean 13.5 vs. 10.2, P<0.03), despite the fact that no significant differences in tumor size were observed between histological subtypes. SCC showed significantly larger tumor size than the AC (mean 5.12 cm vs. 3.33 cm, P<0.006). The optimal cut-off value of SUVmax to predict malignancy in the whole series was 10.6 (P=0.026). No significant differences were observed between primary tumor size and SUVmax (P>0.08).

Conclusions: These data suggest that SCC tumors have significantly greater uptake on PET/CT than AC tumors. This findings might be useful to identify the predominant pathology of mixed tumors. Further studies are needed to confirm our results.

MULTIMODAL ANALGESIC TREATMENT IN VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY USING AN INTRAOPERATIVE INTERCOSTAL CATHETER

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Objectives: No golden standard analgesia exists after video-assisted thoracic surgery (VATS) lobectomy. Acute postoperative pain following VATS lobectomy, without the use of rib-retractor, is considered to originate from the drain site. Thus, we wanted to report our experience with a simple multimodal analgesic treatment including a continuous intercostal catheter at chest drain level.

Methods: A prospective series of 48 consecutively patients received a standardized regimen consisting of daily: 4 g paracetamol, 1600 mg ibuprophen and 900 mg of gabapentin. Intraoperatively, surgeons performed a single shot paravertebral block (PVB) at 5 levels (15 ml) and then inserted an intercostal catheter (ICC) at level of the drain site for continuous delivery of 6 ml 0.5% bupivacaine/h. Patients were followed for four days or until discharge.

Results: Forty-eight patients, mean age 64±13 years, with a median surgery time of 127 min (range 75-225 min) were included. Median time of PVB and ICC placement was 5 min (inter quartile range, 4-6 min). Median pain score at rest using a numerical rating scale (0-10, no pain to worst imaginable pain) was 2 in the 1st-6th postoperative hour. Mean morphine consumption on postoperative day (POD) 0 was 18 mg and rescue via the ICC was administered a median of 2 times (range 0-5). As a standard, the ICC was removed together with the chest drain, followed shortly afterwards by discharge of the patient. By the end of POD 1, 2, 3 and 4, respectively 24, 13, 6 and 3 patients still had a chest drain and received the simple multi-modal treatment including ICC. Conclusions: Localised pain from the chest drain as seen after VATS lobectomy may be adequately controlled using a multimodal regimen including an intercostal catheter. The low pain scores and time used inserting the ICC may offer an alternative to thoracic epidural analgesia.

PULMONARY REHABILITATION AND PROPHYLACTIC NON-INVASIVE VENTILATION BEFORE LUNG CANCER SURGERY IN VERY HIGH-RISK PATIENTS

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Objectives: The benefits of a rehabilitation program before lung cancer resection remain to be defined. The purpose of this prospective observational study was to assess the effects of pulmonary rehabilitation associated with non-invasive ventilation (NIV) in patients with high operative risk.

Methods: Between December 2009 and December 2010, 14 consecutive patients (12 males, 2 females, mean age: 66 years (44-79)) with a clinical N0 non-small cell lung cancer were included. Eligibility criteria were a predictive respiratory function (FEV1, VO2max) under the thresholds of the guidelines and/or associated severe co-morbidities increasing the thoracoscopic level.
The protocol included a cardio-respiratory rehabilitation program and 3 h of NIV a day. The function tests were repeated after 3 weeks of therapy. Results: The average increase of the FEV1, of the VQmax was 12% and 3.5 ml/kg/min, respectively. Carcinologic surgery was performed in 175 patients (lobectomy, n=9; pneumonectomy, n=2; bilobectomy, n=2; segmentectomy, n=1). The postoperative complication rate was 35.7% (acute renal failure, n=2; atelectasis n=1; prolonged air leak, n=1; hemotherax, n=1). There was no postoperative death. The mean duration of hospital stay was 11 days. A postoperative rehabilitation allowed a return home in all patients.

Conclusions: Pulmonary rehabilitation associated with perioperative NIV allows carcinologic surgery performance at first-line not eligible patients. An evaluation of the long-term survival in comparison to the non-surgical therapies is necessary. *: ERS/ESTS clinical guidelines in lung cancer patients; The Thoracic Surgery Scoring System (Thoracoscore) of the French Society of Thoracic and Cardiovascular Surgery; Epithor Group.

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NON-SMALL CELL LUNG CANCER (NSCLC) HISTOLOGIC TYPES AND ACCURACY OF INTEGRATED POSITRON EMISSION TOMOGRAPHY AND COMPUTED TOMOGRAPHY (PET/CT) FOR INTRATHORACIC NODAL STAGING
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Objectives: To compare the accuracy of integrated PET/CT for the preoperative assessment of intrathoracic nodal status between patients with adenocarcinoma (AD) and those with squamous cell carcinoma (SQ).

Methods: Retrospective study of 353 consecutive patients with clinically resectable NSCLC who underwent surgical nodal staging after integrated PET/CT had been obtained. Histological results were used as reference standard.

Results: A total of 2286 nodal stations (1643 mediastinal, 333 hilar and 310 intrapulmonary) were assessed. Prevalence of N disease was 32.4% (79/244; N1=31; N2=47; N3=3) and 29.3% (32/109; N1=21; N2=11) in AD and SQ patients, respectively. PET/CT staged the disease correctly in 193/244 (79/244; N1=31; N2=47; N3=1) and 29.3% (32/109; N1=21; N2=11) in AD and SQ patients, respectively. PET/CT had lower sensitivity [53.8% (43/80) vs. 87.5% (79.1%) AD patients and 91/109 (83.5%) SQ patients. Understaging occurred in 79/244 (32.6%) AD patients and 10/109 (9.2%) SQ patients.

Conclusions: Compared with histological staging, PET/CT is a reliable tool for the assessment of nodal status. Invasive procedures for confirmatory tissue diagnosis are necessary for accurate preoperative nodal staging.

P-120
VAGAL-SPARING RADICAL OESOPHAGECTOMY IMPROVES LONG-TERM FUNCTIONAL RESULTS WITHOUT COMPROMISING ONCOLOGICAL OUTCOME IN PATIENTS WITH CARCINOMA
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Objectives: The intersection of vagus nerves routinely accompanies oesophagectomy is the main cause of digestive disorders during years after operation. With the aim to improve long-term quality of life we modified routine procedure with preservation of vagus nerves.

Methods: We evaluated the quality of life in 19 patients (T1N0M0-T2N1M0) who underwent the radical vagal-sparing oesophagectomy (2005-2009) with 29 patients that were operated in the routine mode. The quality of life was assessed by evaluating motor activity of gastric reservoir with radiolabeled meal and QLQ-EORTC questionnaires.

Results: There were no specific complications established in vagal-sparing group (VSG). All patients from VSG were observed more then 12 months. No local recurrences were diagnosed. In one year after operation the progression of the disease was found in one case (T2N1M0).

The motor function of gastric reservoir assessed in technetium gastric emptying scan and was 22% on average after surgery (56% after standard surgery, 14% in healthy persons) after surgery and 24%, 18% and 26% in 6, 12, 24 months appropriately. According to our data patients after vagal-sparing oesophagectomy did not suffer from delayed stomach emptying and dumping. Weight loss (5-15%) was detected in 7 (30%) patients in VSG and in 16 (55%) patients after routine procedure. Quality of life was significantly higher in this group of patients also according to questioning.

Conclusions: Vagal-sparing oesophagectomy in patients with carcinoma significantly improves the quality of life and can be considered as the alternative to routine procedure in patients with early stage disease.

P-121
EFFECTIVENESS OF ANTIREFLUX SURGERY (FUNDOPICATION) FOR THE CURE OF CHRONIC COUGH WITH OR WITHOUT GORD SYMPTOMS
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Objectives: The outcome of surgical therapy for atypical extra-oesophageal symptoms allegedly secondary to GORD is controversial. Aim of this study was to assess the results of antireflux surgery in patients affected by 1) typical, 2) atypical, (chronic cough), in whom a dedicated preoperative work-up was performed.

Methods: Between 1995 and 2010, 151 patients with GORD-related typical and/or atypical symptoms were submitted to antireflux surgery. One hundred percent preoperatively underwent semi-quantitative evaluation of typical/atypical symptoms, chronic cough and oesophagitis, barium swallow, endoscopy and histology and oesophageal manometry (24 h pH-recording or intraluminal impedance/pH monitoring system in the absence of gross oesophagitis). In addition, patients with chronic cough underwent chest HRCT scan, methacholine challenge test and spirometry. Surgery was performed exclusively on patients positive for GORD and negative for pulmonary diseases.

Results: Preoperative tests for GORD were repeated at follow-up.

Conclusions: The preoperative work up was highly effective in selecting patients for antireflux surgery which achieved very satisfactory results in the treatment of GORD and GORD-related chronic cough.

P-122
NEW METHOD OF MINIMALLY INVASIVE TREATMENT OF ESOPHAGEAL ACHALASIA COMBINING LAPAROSCOPIC TECHNIQUE AND ENDOSCOPIC ASSISTANCE APPROACHES
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Objectives: Esophageal achalasia is a rather rare pathology of the esophagus. According to literature data its morbidity does not exceed 0.7 cases for 100,000 people. Laparoscopic esophagogastrotomy for achalasia based on Heller method is the operation of choice, however, such complications as perforation, dysphagia, gastroesophageal reflux, recurrence of the disease are possible. The aim was to work out a new method of minimal-invasive treatment of achalasia, based on the combination of operation of forming esophageogastic anastomosis and antireflux procedures.

Methods: Within 2008-2010 in the Brest regional hospital 19 patients with the diagnosis of achalasia were treated. Stage I of the disease was diagnosed in...
two patients, stage II - in 11 and stage III in six patients. In eight of them (four patients with the second and the four with the third stage) surgical procedure consisted in apparatus esophagegastroduodenostomy by analogy with Grindel’s operation and Toupet fundoplication. The application of the cutting-suturing stapler allows forming esophagofundus-anastomosis for a longitude of 4.5 cm, which means complete dissection of the distal esophageal sphincter.

Results: The duration of the first operation was 140-15 min and for 70-15 min now. Intraoperative hemorrhage was 50-70 ml. The day after the operation all the patients began fluid diet. One patient with the third stage of esophageal achalasia in the early postoperative period had dysphagia of the second degree, which was treated conservatively. The results of the treatment in eight patients showed stable positive clinical effect without any serious complications.

Conclusions: The suggested by us technique of laparoscopic transgastric surgery of esophageal achalasia with endoscopic assistance (by patent priority 20091189) is minimalinvasive, pathogenetically based and clinically effective, which allows to recommend it for implementation in practice as a method of choice.

P-123
MANAGEMENT OF TRACHEOBRONCHIAL FISTULA FOLLOWING ESOPHAGECTOMY
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Objectives: Tracheobronchial fistulas are rare but life-threatening and potentially fatal complications after esophagectomy. Leakage of the esophagogastrointestinal anastomosis with inflammatory involvement of the tracheobronchial tree is the predominant reason for postoperative fistulization between airways and esophagus or gastric tube. Successful treatment is challenging and still controversial discussed. After promising results in the treatment of intrathoracic anastomotic leaks we adopted endoscopic stent implantation as primary treatment option in patients with anastomotic leak induced tracheobronchial fistula. Aim of this study is to investigate the feasibility, the limits and the results of endoscopic stent insertion for closure of postoperative tracheoesophageal fistulas.

Methods: Between January 2004 and October 2010, 211 consecutive patients underwent esophageal resection mainly for esophageal cancer. An anastomotic leak induced tracheobronchial fistula was bronchoscopically verified in seven patients. Four patients received endoscopic implantation of either a self-expanding tracheal or esophageal stent or both as primary treatment. Surgical reexploration was mandatory in two patients because of necrosis of the pulled up gastric tube or gangrene of the airways.

Results: Endoscopic stent-placement was successfully accomplished in all four patients. Two patients received endoscopic implantation of either a self-expanding tracheal or esophageal stent or both as primary treatment. Surgical reexploration was mandatory in two patients because of necrosis of the pulled up gastric tube or gangrene of the airways. Endoscopic stent-placement was successfully accomplished in all four patients. Two patients received endoscopic implantation of either a self-expanding tracheal or esophageal stent or both as primary treatment. Surgical reexploration was mandatory in two patients because of necrosis of the pulled up gastric tube or gangrene of the airways.

Conclusions: Treatment of anastomotic leak induced tracheobronchial fistulas by means of esophageal and tracheal stent implantation is feasible. If stent insertion is limited by gastric tube necrosis or bronchial gangrene the prognosis is likely to be fatal.

P-124
AVOIDING ANASTOMOTIC LEAK AFTER MINIMALLY INVASIVE IVOR-LEWIS ESOPHAGECTOMY THROUGH A STRICT POSTOPERATIVE FEEDING PROTOCOL
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Objectives: Anastomotic leak is one the most common complications of esophagectomy. Minimally invasive techniques of esophagectomy are performed with increasing frequency, but it is unclear if these emerging techniques could allow a reduction of this serious complication. To review the initial experience of a university center in performing minimally invasive Ivor-Lewis esophagectomy (MILE) in order to identify factors associated to the development of postoperative anastomotic leaks.

Methods: Charts of all patients undergoing MILE in a single center between March 2006 and December 2010 where reviewed. Operative results were collected and patients were divided in two groups, before and after the instauration of a strict postoperative protocol that included: 1) retarding oral feeding to the 7th postoperative day, 2) immediate pyloric dilation for any suboptimal gastric emptying on contrast swallow before starting the oral diet, and 3) continuing outside-patient jejunostomy feeding at night to 80% of patients caloric needs up to the 30th postoperative day.

Results: There were: There were 33 total patients, 17 in the earlier group and 16 in the following group. Mortality was the main indication for surgery (27 – ADK, 5 - SCC). There was one conversion to open thoracotomy (3%). Overall, the mortality rate was 6% (two patients) and the anastomotic leak rate was 9% (three patients). All three anastomotic leaks occurred in the earlier group of patients. There was no leak following the postoperative protocol instaration, signifying a reduction of anastomotic leak rate from 18% to 0% (P<0,23).

Conclusions: Although the increasing experience of the surgical team over time must be considerate, the results of this study suggest that the adoption of a strict feeding protocol may minimize the risk of developing postoperative anastomotic leak in patients undergoing MILE.

P-125
DELAYED ANASTOMOTIC RECONSTRUCTION FOR THE COMPROMISED GASTRIC CONDUIT
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Objectives: Major anastomotic disruption and dehiscence is one of the most devastating complications of esophageal reconstruction. Reconstruction is challenging if not well planned at the first intervention. Patients who require esophagectomy with a compromised conduit, require a staged esophageal reconstruction algorithm to provide both excellent survival and long-term functional results.

Methods: Nine patients with either benign (6) or malignant (3) disease underwent urgent (3) or emergent (6) operation via transhiatal (8) or transcervical (1) esophagectomy with placement of the gastric (8) or colonic (1) conduit in the cervical position without anastomosis. Formation of a long esophagostomy placed on the anterior chest was performed in all patients. All patients treated in this fashion survived to their second stage reconstruction, which required cervical exploration and esophagogastric anastomosis at an average of 4 months (2.7 months).

Results: No postoperative leaks occurred, and all patients underwent Barium swallow at seven days postoperatively and were taking a regular diet at the time of discharge from the hospital. All patients are able to orally alment and only two patients require intermittent dilations, both with benign disease.

Conclusions: We provide a management strategy for the marginal conduit, which is successful and reproducible. Visual inspection of the conduit, the patients overall condition, the indication for surgery and the judgment of the surgeon are probably as good a predictor of conduit survival when compared to intraoperative viability studies. The long-term complications of anastomotic disruption are so devastating we describe a method for preventing this complication with excellent outcomes, limited morbidity, no mortality and very good long-term functional results.

P-126
EXTENDED SURGICAL TREATMENT FOR OESOPHAGO Gastric JUNCTION AD ENOCARCINOMA: 10-YEAR EXPERIENCE
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Objectives: To evaluate the possibility and safety of extended surgical resection in patients with oesophagogastric adenocarcinoma with involvement of adjacent structures.

Methods: From 1995 to 2005, 156 patients with oesophagogastric adenocarcinoma were operated in our institution. The patients were divided into 2 groups: group A (98 patients) includes patients without adjacent structures resection and group B (58 patients) with multiorgan resection. The survival,
rates were calculated by Kaplan-Meier method and the difference between the groups was analyzed by log-rank test.

Results: Twelve patients were included in TNM classification stage I in group A; 42 patients were in stage II in group A and 15 in group B; 41 patients were in stage III in group A and 22 in group B; three patients were in stage IV in group A and 21 in group B. In group B only one adjacent structure was resected in 52% of cases (30 patients) and multiple organs (two or more adjacent organs) reseption was performed in 48% (28 patients). The involved organs were spleen in 23 patients, diaphragm in 14 patients, pancreas in 20 patients, mesocolon in six and liver in three patients. The postoperative mortality was 5.1% in group A (five patients) and 6.9% in group B (six patients). The leading cause of postoperative mortality in both groups was septic conditions with multiorgan failure. The postoperative morbidity was 26.5% in group A and 25.8% in group B. The 5-year survival was 28% in group A and 13% in group B.

Conclusions: The extended surgical resection in T4 patients with oesophagogastric junction adenocarcinoma is a valuable approach and does not lead to increased postoperative mortality and morbidity in comparison with patients without adjacent structures resection.

P-127
PROGNOSTIC SIGNIFICANCE OF HIGH PODOPOLIN EXPRESSION AFTER CHEMORADIOThERAPy IN oesophAGEOUS squAMOus CELL CANCERoUS PATIENTS
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Objectives: Podoplanin (PP) antibody has been widely used to stain lymphatic endothelium for evaluating lymphatic microvessel density (LAVD). Tumor cell PP immunoreactivity had also been reported to associate with poor outcome in non-chemoradiotherapy pretreated upper-aero-digestive-tract SCC. Here, we investigated whether tumor PP expression after CRT in esophageal SCC also predicted poor outcome.

Methods: We evaluated the PP immunoreactivity in 113 post-CRT-treated ypTJoN esophageal SCC patients by immunohistochemistry method. The impact of cancer PP expression intensity on patient survival was judged in combination with clinical and pathological descriptors [lymphovascular invasion (LVI), tumor differentiation and circumferential resection margin (CRM)].

Results: There were 109 males and 4 females (mean age, 57.6 years; range: 38-79 years) with the mean tumor length of 5.32 cm. Ninety-five percent patients had PP immunoreactivity on tumor while 38.1% of them were judged as high. High PP expression tumors had higher percentage of LVI but had no association with positive CRM or tumor differentiation. Multivariate analyses revealed tumor PP immunoreactivity and CRM as independent prognostic factors for survival. Patients with positive CRM and high PP expression had worst survival followed by those with either positive CRM or high PP and patients without any of the 2 events (5-year DSS: 5% vs. 20% vs. 40%, P<0.01).

Conclusions: Tumor PP immunoreactivity in conjunction with CRM status are useful markers to identify aggressive post-CRT treated ypTjoN esophageal SCC.

P-128
NEO-ADJUVANT CHEMOTHERAPY INCREASES THE RISK OF ATRIAL FIBRILLATION FOLLOWING OESOPHAGECTOMY
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Objectives: Atrial fibrillation (AF) adds to pre-existing morbidity in an increasingly older population of patients undergoing surgery for intra-thoracic malignant. We examined risk factors for new onset AF following oesophagectomy for cancer in an attempt to guide prophylactic use of anti-arrhythmic drugs.

Methods: A retrospective interrogation of a database of patients who underwent oesophagectomy between 1991 and 2009 was carried out. Patients with preoperative arrhythmias were excluded leaving 997 patients for further analyses. Patients who developed AF were compared to the rest. Univariate and multivariate logistic regression analyses were performed to identify factors predicting AF. Survival curves were produced by the Kaplan-Meier method (log-rank test for comparison). Statistical significance was reflected in a P-value <0.05.

Results: Patients who developed AF (n=209; 20.96%) included 141 males (19.9% of males) and 68 females (23.6%) (P=0.11) and were older (median age 70.54 vs. 66.9; P=0.01). Patients with AF were noted to have a higher in-hospital mortality rate (n=17; 8.1% vs. n=38; 4.8%) (P=0.04), longer stay in hospital (median 14 vs. 12 days; P=0.01), and a greater risk of developing pulmonary embolism (n=10; 11.5% vs. P=0.01) but no anastomotic leak (n=15; 7.2% vs. 5); 6.7%; P=0.46). AF did not affect long-term survival (median survival 18.19±2.3 vs. 19.77±1.09 months; P=0.42). Multivariate analysis identified age and neo-adjuvant chemotherapy to be independent predictors of the risk of developing postoperative AF.

Conclusions: Age and neo-adjuvant chemotherapy are independent predictors of the risk of developing AF after oesophagectomy. AF was associated with a higher mortality and length of stay in hospital but did not affect overall survival. However, AF is a frequent occurrence after major thoracic surgery and a better understanding of its mechanisms is necessary before prophylactic strategies are considered.

P-129
LOCALLY ADVANCED ESOPHAGEAL ADENOCARCINOMA: NEOADJUVANT RESPONSE AND SURVIVAL CAN BE PREDICTED BY [18F]FDG-PET-CT
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Objectives: [18F]fluorodeoxyglucose-Positron Emission Tomography/Computer Tomography (PET/CT) is commonly used in staging of locally advanced (cT2N1M0-T3A4N1-M0) esophageal adenocarcinoma. The value of PET/CT in predicting overall survival or neoadjuvant response is unclear.

Methods: Eighty-four consecutive patients with locally advanced adenocarcinoma were operated after neoadjuvant therapy (52 patients received chemo- and 6 radiochemotherapy). Staging was done prospectively using PET/CT before and after completion of neoadjuvant therapy. Pre- and post-therapy maximal standardized uptake values (SUV, and SUV2) were determined, and their relative change (SUV%) was calculated. SUVs and their changes were compared with histopathologic response and overall survival.

Results: Histopathologic response (≥10% vital tumor cells in resected tumor bed) was achieved in 13/58 patients (22.4%). Median follow-up time was 17.5 months (range 4-62 months). Overall survival probability at three and five years was 57.1% (Kaplan-Meier). In ROC analysis, histopathologic response was optimally predicted by an over 47% change in baseline maximul SUV (≥ 100%, ≤ 50, SI: 53.33%; PPV 38.24% and NPV 100%). In univariate survival analysis, Kaplan-Meier, Log-rank association with prolonged overall survival was found with histopathologic response (P=0.036), male gender (P=0.009), SUV2 ≤47% (P=0.003), ypN - (P=0.002) and ypM - (P=0.001) categories. In Cox regression proportional hazards survival analysis (same model with histopathologic response, gender, ypN and ypM categories), SUV2 ≥47% (HR 0.250, P=0.010) was independently associated with good prognosis.

Conclusions: Our results suggest, that PET-CT could be used to exclude patients who will not have complete histopathologic response. However, this finding should not be used to guide treatments algorithms since patients with even partial response seem to have favorable prognosis. As an independent prognostic marker, PET-CT results can contribute to clinical decision-making.
Results: Three patients were inoperable at the time of surgery after 6 cycles of platinum-based induction chemotherapy due to infiltration of the arcus aortae (n=2) and conus pulmonalis (n=1). These patients underwent chemo-radiation therapy afterwards. Eight patients underwent complete mediastinal tumor resection and pleurectomy. Complete pleurectomy was performed in 2 patients. Two patients had 4 cycles of platinum-based induction chemotherapy. Six patients without induction therapy proceeded to adjuvant chemoradiation (n=3) and adjuvant radiation (n=3), respectively. Morbidity was observed in 2 patients (25%) including chylothorax and necessity of mechanical ventilation because of myasthenic crisis. No mortality occurred. Mean follow-up was 40.3±22.4 months. No patient was lost to follow-up. Pleurectomy was associated with prolonged survival (66.1±3.6 months) compared to unresectable patients who underwent chemoradiation (22.4±9.2 months, P=0.017).

Conclusions: Pleurectomy can be performed with low morbidity and mortality in locally advanced Masaoka stage IVA thymoma. Despite imaging studies exploring thoracotomies might occur because of possible gray zones in distinguishing between tumor invasion and attachments. Long-term survival might be achieved in highly selected patients. The timing (neoadjuvant vs. adjuvant) of chemotherapy and radiotherapy remains unclear.

P-131
IS THORACOSCOPIC THYROIDECTOMY SUPERIOR TO STERNOTOMY IN THE MANAGEMENT OF BENIGN RETROSTERNAL GOITER? - TEN-YEAR EXPERIENCE AT A SINGLE THORACIC UNIT
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Objectives: To evaluate the use of a combined thoracoscopic and cervical approach as an alternative to sternotomy in the management of retrosternal goiter.

Methods: A consecutive series of 24 patients referred for thoracic surgical input for benign retrosternal goiter was reviewed from 2001 to 2010. The surgical approach was decided during preoperative discussion between endocrine and thoracic surgeon. In the majority of cases the operation commenced with trial cervical dissection. Our surgical intent was to mobilise the intrathoracic thyroid component by video assisted thoracoscopic surgery (VATS) if inferior excision could not be completed. The procedure was performed via three 2 cm ports under single lung ventilation using sharp and blunt dissection. In all VATS cases a right axillary approach was used. In selected cases primary open surgery was performed due to the size and location of the gland.

Results: Of 23 patients (8 males:15 females) referred by endocrine surgeons: 10 patients had cervical incision alone; 7 patients required open thoracic surgery. All the variables showing a potential association with perioperative morbidity and mortality.

Conclusions: Pleurectomy can be performed with low morbidity and mortality in locally advanced Masaoka stage IVA thymoma. Despite imaging studies exploring thoracotomies might occur because of possible gray zones in distinguishing between tumor invasion and attachments. Long-term survival might be achieved in highly selected patients. The timing (neoadjuvant vs. adjuvant) of chemotherapy and radiotherapy remains unclear.

P-132
INTRA-THORACIC LYMHP NODE INVOLVEMENT IN EXTRA-THORACIC MALIGNANCIES: DIAGNOSTIC VALUE OF PET-CT
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Objectives: Intra-thoracic lymph nodes may be affected due to an extra-thoracic malignancy. In this study, pure mediastinal and hilar lymph node involvement in extra-thoracic malignancies were evaluated. Diagnostic value of size of the lymph nodes and FDG uptake values compared with histopathological results.

Methods: Twenty-two patients (16 females and 6 males, mean age was 59.14) with extra-thoracic malignancies underwent surgical lymph node biopsies because of suspect of mediastinal or hilar lymph nodes metastasis. Chest CT and FDG PET-CT were used in screening for metastases. If the mediastinal lymph node >10 mm and/or SUVmax value >2.5 the patient underwent video-mediastinoscopy for mediastinal lymphadenopathy and video-thoracoscopy for hilar lymph node biopsies.

Results: Metastatic lymph nodes were diagnosed in 10 of the 22 patients (45%). The most common malignancy caused mediastinal and hilar lymphadenopathy were colon-rectum carcinoma (27%). Lymphadenectomy was done for single lymphadenopathy in eight of the patients. Malign metastases were frequent in single hilar lymphadenopathies (62.5%) whereas less common in multiple lymphadenopathies (35.7%).

Conclusions: Mediastinal and hilar lymph node metastases may affect the choice of treatment and survival rates in extra-thoracic malignancies. Neither CT, nor PET-CT can provide the differential diagnosis. Lymph node size and SUV Max uptake values can be misleading, histopathological diagnosis is necessary for correct staging and appropriate treatment of the disease. Total lymphadenectomy via videothoracoscopy or videoendomediastinoscopy may also provide metastatectomy in case of single lymph node metastasis.

P-133
POSTOPERATIVE OUTCOME AFTER THYMECTOMY: THE CRUCIAL ROLE OF THE PREOPERATIVE CLINICAL RISK STRATIFICATION
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Objectives: Clinical risk stratification score in patients underwent thymectomy is still unclear and to date, no clinical factors have been clearly identified as predictors of postoperative complications. The aim of this study is to analyze postoperative outcome after trans-sternal thymectomy for myasthenia gravis (MG) or thymomatous disease.

Methods: From 1 March to 12 July, the data of 86 patients who underwent trans-sternal thymectomy were prospectively collected. The following preoperative features were evaluated: sex, age, body mass index, grade of symptoms (MGFA/Osserman-Classifications), disease interval, existence of thymoma and Masaoka Staging, history of myasthenic crisis, doses of anti-cholinesterase drugs, steroid use, pulmonary function, blood gases analysis, presence of other disease, operation time and blood loss. In all cases MG was substantially well-controlled by the drug-therapy before surgery. Myasthenic patients were admitted in intensive care unit (ICU) (for the first 24 h) after surgery. All the variables showing a potential association with perioperative outcome (P<0.10) were entered into a multivariate analysis (Cox proportional hazard model) to identify independent predictive factors.

Results: Mean hospitalization stay and mean ICU stay were 7.5±3.2 days and 27.0±14.3 h, respectively. Postoperative morbidity was 11.6% (10 patients) and blood transfusions were needed in 34 cases (39.5%). One patient died (30-day mortality: 1.2%). Osserman grade is proven to be the only independent predictive factor for postoperative complications while none of the pulmonary functional values seems to be significant. Additionally, ICU-stay is longer in patients with previous history of myasthenic crisis.

Conclusions: When a preoperative good neurological status is achieved, the Osserman grade is the only independent predictive factor of postoperative outcome after trans-sternal thymectomy.

P-134
DESCENDING NECROTIZING MEDIASTINITIS: IMPROVING SURVIVAL WITH A NOVEL TREATMENT ALGORITHM
J. D’Cunha, M.B. Antonoff, M. James, M. Mittke, G. Bellman, R. Andrade, M. Maddaus
Surgery, University of Minnesota, Minneapolis, MN, USA

Objectives: Necrotizing mediastinitis (NM) is a highly lethal and uncommon infectious process. We hypothesized that an algorithmic approach utilizing surgical debridement and frequent cervicotoracic imaging would decrease morbidity and mortality.

Methods: We prospectively applied a treatment algorithm for NM that identified as predictors of postoperative complications. The aim of this study is to analyze postoperative outcome after trans-sternal thymectomy for myasthenia gravis (MG) or thymomatous disease.

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Conclusions: When a preoperative good neurological status is achieved, the Osserman grade is the only independent predictive factor of postoperative outcome after trans-sternal thymectomy.
required 4 operative debridements (1-15). Patients received 6 antibiotics (2-10) for 42 days (40-55). Median hospitalization was 33 days (16-55). We achieved 100% survival (median follow-up 15.4 months), with no major complications, readmissions, or reinfections.

Conclusions: Application of a systematic approach to NM treatment reduced mortality. Patients had excellent outcomes despite the widely known lethality of this condition, suggesting that such an algorithmic approach decreases complications and improves survival.

P-135
THE PATHOLOGICAL MASAOKA STAGE IS THE MOST IMPORTANT PREDICTOR OF RECURRENT IN RESECTED THYMOMA
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Objectives: The rate of recurrence is a better measure of outcome after resection of thyomma than overall survival because of the indolent behavior of thyomma.

Methods: We have performed a multivariate analysis of predictive factors in 305 patients surgically treated for thyomma from 1987 to 2009 to define which factors independently predict recurrence.

Results: Out of 305 patients, 41 patients had recurrence (13.4%). The recurrence rate was 0% (0/19), 6.3% (4/63), 4.3% (2/48), 18.6% (11/59), 20.7% (24/116) in type A, AB, B1, B2, B3 tumors, respectively. The recurrence rate according to Masaoka stage was 6.1% (8/132), 11.4% (13/114), 26.8% (11/41), 50.0% (9/18) in stage I, II, III, IV, respectively. In univariate analysis, operation type performed (extended thyomectomy vs. thymomectomy), resection type (R0 vs. R1), WHO histologic type (A, AB, B1 vs. B2, B3), pathological Masaoka stage, size of tumor (<8 cm vs. >8 cm) and type of adjuvant therapy presented significant difference on freedom from recurrence after resection of thyomma. In multivariate analysis, only the pathological Masaoka stage was significantly independent predictor on recurrence (HR 1.595; 95% CI, 1.140-2.232; P=0.006).

Conclusions: The recurrence of thyomma after resection is correlated with WHO histologic type and the pathological Masaoka stage. The pathological Masaoka stage is the most important predictor of recurrence.

P-136
SUPPURATIVE THORACIC INFECTIONS CAUSED BY STREPTOCOCCUS MILLERI
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Objectives: Streptococcus milleri (SM) are normal colonizing bacteria of the gastrointestinal and genitourinary tract, which can manifest high virulence causing aggressive tissue destruction throughout the body. We aim to make surgeons appreciate the deleterious nature of this organism by presenting our experience in managing suppurative thoracic infections caused by SM.

Methods: This is a retrospective case series comprising four patients with complicated suppurative SM thoracic infections who were referred to our thoracic surgical unit over the past 24 months. For each of these cases we examine the presenting features, the extent and progression of the infection, and management.

Results: Two patients presented with empyema and required multiple surgical procedures, including thoracotomy with extensive soft tissue debridement and pleural drainage, vacuum dressing applications, and musculocutaneous flap reconstruction. The other two patients presented with descending mediastinitis resulting from either peritonsilar or dental abscesses and underwent multiple open debridements with wide drainage of the neck, mediastinum and affected pleural cavities during prolonged stays in the ICU. One patient required musculocutaneous flap reconstruction. All four patients survived their hospital stay of 41.5 days.

Conclusions: SM infection reaches the thoracic cavity by either aspiration of oral secretions, direct inoculation during instrumentation or trauma, mediastinal descent of cervical infection, such as retropharyngeal abscess, or haematogenous spread. They are remarkably resistant to antibiotic treatment alone and therefore urgent surgical intervention is often necessary. According to the literature SM is cultured in up to 50% of the total number of cases of suppurative thoracic infections. This infection carries with it a significant patient morbidity and leads to prolonged ITU and hospital stays. We have found that early awareness and a combination of aggressive medical and surgical management is paramount for successful outcome in patients presenting with suppurative thoracic infections attributed to SM.

P-137
RESECTION OF THYMOMA: VATS VERSUS STERNOTOMY. DOES IT REALLY MATTER?
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Objectives: The aim of this study was to determine the efficacy of thymoma resection with videothoracoscopic surgery (VATS).

Methods: A retrospective review was done on the prospective thymoma database of 110 patient's records from June 2001 to December 2010. Forty-four patients, who had no adjuvant treatment or extended resections (23 patients) and patients who had thoracotomy or pleural implants (21 patients) were excluded. Sixty-six patients (Group 1: 30 patients who underwent complete VATS resection) and (Group 2: 36 patients who underwent sternotomy) were analyzed and 2 groups were compared to each other.

Results: Groups were similar in terms of age (P=0.81), gender (P=0.6), WHO classification (P=0.2), presence of myasthenia gravis (P=0.3) and number of complications (P=0.8). Groups showed statistically significant difference in terms of length of postoperative stay (P=0.002) and Masaoka stage (P=0.05). Further analyses in myasthenia gravis (MG) patients demonstrated that MG patients with VATS (4.7±2.6) experienced statistically significant shorter postoperative stay than MG patients with sternotomy (13.5±10.8 days) (P=0.002). However, no benefit was demonstrated with VATS thymoma resection in non-MG patients (P=0.3) with regards to length of postoperative stay.

Conclusions: VATS resection of thymoma is a developing technique with demonstrable benefit of postoperative length of stay, particularly in MG patients. This study did not show any benefit in non-MG patients other than cosmesis. In these series, mean number of Masaoka Stage in VATS resected patients were smaller than those of sternotomy patients and it may also need to be considered.
P-139
MINIMALLY-INVASIVE STRATEGY OF MEDIASTINAL STAGING OF LUNG CANCER
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Objectives: The aim of the study was to assess a minimally invasive strategy for mediastinal staging of lung cancer, incorporating the combined-ultrasound (EBUS-NA plus EUS-NA) and PET-CT. Methods: A consecutive group of lung cancer patients underwent PET-CT scanning and the combined ultrasound (CUS) imaging of the mediastinum with needle biopsy of N2/N3 nodes. CUS-negative patients underwent pulmonary resection with systematic lymph node dissection. The diagnostic yield of these techniques was calculated for any N2 involvement and for more than minimal N2.

Results: There were 202 patients enrolled, mean age was 64 years. In 106 of them CUS confirmed multi-level or bulky N2/N3 disease and these patients were referred to induction treatment. The remaining 96 patients underwent surgery. The mean number of mediastinal nodes removed was 16. The sensitivity, specificity, PPV and NPV of CUS in detecting any N2 involvement were: 0.89, 0.92, 0.96 and 0.85, respectively. For the more than minimal N2 these figures were: 0.96, 0.93, 0.95, and 0.96, respectively. Incorporation of PET-CT resulted in increase of the sensitivity and NPV of CUS to 0.93 and 0.86 for any N2, and to as high as 0.98 and 0.97 for more than minimal N2, respectively. There were no procedure-associated complications.

Conclusions: 1) CUS is safe and accurate, minimally invasive technique of mediastinal staging. 2) Incorporation of PET-CT increases the sensitivity and NPV of CUS. 3) In patients with negative result of both: CUS and PET-CT the risk of any N2 involvement is low and the risk of more than minimal N2 involvement is very low, and these patients do not need invasive mediastinal exploration.

P-140
MANAGEMENT OF TOTAL CICATRICIAL LESION OF TRACHEA: TRANSPLETION OF TRACHEA WITH REVASCULARIZATION
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Objectives: Treatment of subtotal cicatrical stenosis of trachea remains difficult task of modern thoracic surgery.

Methods: Thirty-seven years old patient with complaints to tracheostoma, dyspnoea, productive cough, chest pains. The general condition was heavy due to heavy dyspnoea with desaturatation to 84%. Chest CT and bronchoscopy revealed cicatrical lesion of trachea from 2 cartilage ring up to last cartilage ring above the carina. In addition, on the membrane wall there were several blunt canals to mediastinum. The unique way to help was tracheal replacement. The waiting time of donor was 254 days. Donor was 40 years old male, dead from severe brain trauma. Approach was cervicothoracic with partial sternotomy. Trachea was dissected on level of 1 intercartilageal interval and in caudal end left tracheobronchial angle was dissected. Thyreotracheal complex was located in mediastinum and cranial and caudal tracheo-tracheal anastomoses were performed by Vicril 2/0. Anastomosis between left and right inferior thyroid arteries and brachiocephalic artery was performed. In lateral wall of left brachiocephalic vein inferior thyroid vein of donor was implanted. After beginning of blood flow we noted perfect pulsation of all donor thyroid vessels. In 6 h after operation patient was extubated.

Results: Patient was discharged with free breathing, without tracheostoma and fever. At three years after procedure he had undergone stenting on lower part of donor trachea because of compression from outside probably by donor thyroid gland. At four years after TTR patient breathing well. His immunosupression regimen includes cyclosporine A 200 mg/day, mofetyl mycofelonate 2 g/day. He evaluates quality of life as good.

Conclusions: Replacement of trachea with revascularization remains very difficult task of modern thoracic surgery but if performed successfully this procedure might save and improve quality of life of patients with total incurable lesion of trachea.

P-141
TRACHEO-INNOMINATE ARTERY FISTULA
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Objectives: Retrospective analysis of tracheo-innominate artery fistula cases in our institute.

Methods: An uncommon and life threatening condition that can happen following tracheal reconstruction surgeries. We present a series of 9 cases out of 402 tracheal reconstructive cases done over a period of 25 years at our institute. This condition carries a very high mortality rate - 80-100% and this rate remains the same even when prompt surgical treatment has been done. Death results from exsanguination and or asphyxia. The principle of surgery is to maintain cerebral perfusion at all times. This was done using a ringed PTFE graft and a temporary shunt to perfuse the cerebral circulation.

Results: Four cases died due to massive haemorrhage before surgery. Five were successfully operated. All cases were seen in the first half of our series.

Conclusions: Prevention of this complication in high risk individuals seems to be the most appropriate strategy at the moment. Surgical advances and better strategies are the need of the hour since a very high mortality is still seen with all modalities of existing surgeries. High index of suspicion and early intiation of surgical correction has been most important predictor of survival. Attention to wound site infection after tracheal reconstruction surgery is very half of that. In the first half of our cases we do not skeletonise the innominate artery and when we anticipated that the anastomosis was close to the artery we used an interposition muscle graft.

P-142
TRANSSTERNAL VERSUS TRANSCERVICAL APPROACH IN MANAGEMENT OF LEFT MAIN BRONCHIAL FISTULA: INDICATIONS AND TECHNIQUE
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Objectives: Left primitive bronchial fistula remains a severe complication of left pneumonectomy. Medistinal approach methods use a non-contaminated operatory field with an evisonormal anatomy. Classical method of transsternal transpericardic approach, developed in the 60's is now in a competition with minimally invasive surgery, especially with transcervical approach first described by Azorin, in 1996.

Methods: We performed between 2000 and 2008, 6 cases (4 males, 2 females) of transsternal transpericardic left primitive bronchial fistula. In one case we have relapse after six days and one difficult dissection, and in the last 14 months we performed transcervical approach of the left primitive bronchial fistula in two cases, one female (40 years old) and one male (44 years old), both with pneumonectomy for destroyed lung parenchyma. In the female case, the interval between pneumonectomy and closure of the stump, was six months; in that time, we performed a Clagett window. After bronchial closure, we have filled the remaining cavity with latissimus dorsi flap. The second case, was a transcervical approach, 10 years after left pneumonectomy, during which his recurrent empyema was surgically drained and cleaned through the drain. Full mobilization of the patient was achieved in the next 6 h after the operation.

Results: In both transcervical cases, the length of the bronchial stump (more than 1.5 cm) allow stapling, we did not drain the second case, and in the first case we remove the drain at 24 h with under 50 cc ml of blood. Mean operating time was reduced to 70 min, related to 150 min of the transsternal transpericardial approach. In the transsternal group the recovery of curett device was simple and classical with draines removed at 48 h with median loses of 200 ml of blood. Full mobilization in this category was achieved in the 4th postoperative day, and pain remain for the next 2-4 weeks.

Conclusions: Transcervical approach of the left main bronchus gain ground for reasons of reduction of the operating time and hospital stay, reduction of mortality and morbidity related to transsternal approach, and being a non-shocking and an anatomical method. Yet, the transcervical approach requires a thorough knowledge of the surgical anatomy and adequate technical equipment (videomediastinoscope, endoscopic stapler), being addressed to selected patients.
P-143
BRONCHIAL FOREIGN BODY RETRIEVAL IN CHILDREN USING A LARYNGEAL MASK
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Objectives: With focus on the use of the flexible bronchoscope through a laryngeal mask (LM), we describe the epidemiology of children with suspected aspiration of foreign body (FB) to the bronchial system. Traditionally, a stiff endoscope is used, a method rarely used in our institution.

Methods: Reviewing our surgical database revealed pediatric patients referred to us with suspected FB of the bronchi during a 15-year period (1994-2010). Double-checking the pediatric database made our retrospective material more complete. We registered symptoms, clinical findings and perioperative care.

Results: One hundred and forty-two patients under the age of 16 were admitted with suspected FB. Median age was 19 months (7-187). The symptoms were fever 40%, cough 32% and/or stridor 34%, but 15% were unaffected. Chest X-ray was helpful only in half the cases. The anesthesia was mainly induced by intravenous drugs. Only 10% (7%) were performed with a stiff endoscope. A FB was found in 76%. The FB’s were located equally in the bronchial system (47% right, 46% left), 6% tracheal. Forty-six percent were nuts, 22% were carrots or other dried foods. Seven percent were hairpins (older children). Four patients needed thoracotomy due to impacted FB, and one child suffered perforation from the retrieval basket through the lung. One patient had a minor pneumothorax. Two patients (15 and 18 months) had cardiac arrest, and was braindead and braindamaged on arrival. Seven patients examined with LM were intubated and transferred to ICU: one due to laryngeal spasms, six due to prolonged awakening, to long procedure or pneumonia. Nine patients were intubated when received or from the start.

Length of in-hospital stay was 2.5 days (median, 1-42 days).

Conclusions: We present the largest single center material where the laryngeal mask is first choice when retrieving bronchial foreign bodies, and we find it safe in this setting.

P-144
MOUNIER-KUHN SYNDROME
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Objectives: Mounier-Kuhn syndrome (tracheobronchomegaly) is a rare clinical entity characterized by marked dilatation of the trachea and central bronchi. Severe atrophy of the longitudinal elastic fibers with thinning of the muscularis mucosa cause tracheobronchial tree enlargement. It presents as recurrent respiratory infections, bronchiectasis and scars in lung parenchyma. We report a case of Mounier-Kuhn syndrome, diagnosed by demonstration of abnormal dilatation of the trachea and main bronchi by thorax CT and fiberoptic bronchoscopy.

Methods: A 53-year-old male patient with renal amyloidosis was admitted to our clinic because of respiratory symptoms. The patient had a history of recurrent lower respiratory tract infections since childhood. Physical examination revealed cutaneous paleness and diffused bronchial rales. A chest computed tomographic scan revealed an abnormal dilatation of the trachea and main bronchi with transversal diameters of the trachea of 50 mm. There was bilateral bullous emphysema and consolidations in the lower lobes. A fiberoptic bronchoscopy was performed and large trachea and main bronchi were seen with a collection of secretion.

Results: The patient received oral antibiotics and expectorant treatment. Conclusions: The Mounier-Kuhn syndrome has a wide spectrum of clinical abnormalities ranging from minimal disease to respiratory insufficiency. Symptom based treatment should be planned. Conservative management is enough almost all cases.

P-145
TREATMENT OF LARYNGOTRACHEAL STENOSIS
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Objectives: The aim of the study is the presentation of own experience in treatment of laryngotracheal stenosis.

Methods: In 2000-2009 at General Thoracic Surgery Department of Medical University in Lodz 50 patients with stenosis of laryngotracheal area were treated. There were 39 men and 11 women (aged 16 to 62-year-old, mean 42). In retrospective analysis the reason of intubation, location and length of stenosis, degree in Cotton’s scale, treatment’s method and results were analysed.

Results: Stenosis was a result of: intubation in 28 patients, tracheostomy in 19, strumectomy in two and coagulation of papilloma in one patient. The main causes of intubation or tracheostomy were: coronary disease – 25, injury – 14, central nervous system disease – six, other – five cases. All patients had third or fourth stenosis degree in Cotton’s scale. It’s length was from 15 to 40 mm. Sixty three intervention were carried out. There were 51 operations and 12 endoscopic interventions. Resection of stricture and primary anastomosis was done in 28 cases, resection of stenosis and Montgomery T tube insertion was done in 12 cases. In two patients tracheostomy was performed. Cutting of thyroid cartilage and Chamberlain’s manoeuvre was carried out in two cases additionally. Dilatation in seven patients and argon coagulation in five patients were performed. The results of management were good in most patients. There was one case of recurrence and two cases of anastomotic dehiscence. All that patients were reoperated and treated with use of Montgomery T tube. There was one perioperative death related to main illness (myocardial infarction).

Conclusions: 1. The best treatment method of laryngotracheal stenosis should be chosen individually with consideration of patient’s clinical condition. 2. The multistage medical procedures are sometimes needed in management of laryngotracheal stenosis.

P-146
ABOUT INDICATIONS TO SURGICAL TREATMENT OF PATIENTS WITH POSTINTUBATION RUPTURES OF TRACHEA
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Objectives: Damages of tracheal membrane remain rare, but terrible complications of tracheal intubation. Meanwhile, now there are no uniform tactical principles of management of such pathology. On the basis of the retrospective analysis and the review of the literature to study efficiency of surgical and conservative tactics at the iatrogenic isolated ruptures of a trachea and to prove indications to operation.

Methods: Thirty-seven patients with isolated postintubation ruptures of a trachea were managed. Female - 29, males - 8. The age varied from 27 till 74 years. The main diagnostic method was bronchoscopy. The cervical department has been damaged in 10 patients, chest - at 21, total lesion - at six. Extent of defect varied from 0.5 cm to full longitudinal rupture. Surgically ruptures of a trachea have been eliminated in 11 cases. It was applied right lateral or posterior thoracotomy, longitudinal closing of defect by Vicryl, in two cases in addition strengthened muscular flap was used. Dilatation in seven patients and argon coagulation in five patients were performed. The results of management were good in most patients. There was one case of recurrence and two cases of anastomotic dehiscence. All that patients were reoperated and treated with use of Montgomery T tube. There was one perioperative death related to main illness (myocardial infarction).

Conclusions: 1. The best treatment method of laryngotracheal stenosis should be chosen individually with consideration of patient’s clinical condition. 2. The multistage medical procedures are sometimes needed in management of laryngotracheal stenosis.

P-147
POSTINTUBATION TRACHEAL INJURIES
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Objectives: Postintubation tracheal injuries (PTI) are among the most serious iatrogenic complications. It comes to them, both during an emergency and elective intubation. May occur in patients after insertion single (SLET) and double lumen endotracheal tube (DLET). The aim of this study was to analyze the diagnosis and treatment of patients with PTI.
Methods: We treated 21 patients. In this group, 13 lesions occurred after thoracic surgery and eight after surgery. In 11 cases, the rupture was after DLET in 10 after SLET. In nine cases the diagnosis was placed intraoperatively and 12 were diagnosed after surgery. Twenty cases were between 10 within 24 h and two within 2-3 days. Tracheal injury during surgery suggested symptoms of mediastinal emphysema (4), air leak (1) and the visible wounds of the trachea (2). After the operation, tracheal damage suggested increasing subcutaneous emphysema (11) and the characteristics of mediastinal emphysema in X-ray (4). In all cases the diagnosis was confirmed by bronchoscope. Damage occurred in the membranous part of trachea and their length ranged from 4 to 1 cm. Treatment was conservative (11) and surgical (12).

Results: Most deaths (four cases) occurred in patients treated with tracheal suture wounds and all were the result of a deep rupture diagnosed postoperatively. In the group treated conservatively there was one death of a patient with severe cardiopulmonary respiratory failure.

Conclusions: In cases of minor damage to the trachea in patients diagnosed postoperatively in good general condition, in which there were no signs of respiratory failure, conservative treatment can be applied. In cases of deeper injuries treated conservatively should aim to decompress the damaged section of the trachea through the setting of balloon endotracheal tube or tracheostomy. Injury identified intraoperatively obtain surgery as soon as possible and lead to patient extubation.

P-148
SIGNIFICANCE OF ANTI-HLA IMMUNIZATION IN LUNG TRANSPLANTATION
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Objectives: HLA immunization is triggered by pregnancy, blood transfusion or organ transplantation. It is recognized factor for graft dysfunction after lung transplantation. This study retrospectively assesses correlation between antibodies and occurrence and severity of bronchiolitis obliterans syndrome (BOS), and survival after lung transplantation (LT).

Methods: Retrospective study from January 2004 to June 2010 including 99 LT in 92 patients. We determined three groups: specifically immunized against their pulmonary graft (group 1, n=19), non-specifically immunized (group 2, n=19), non-immunized (group 3, n=64). We compared FEV1 evolution curves between antibodies rates and FEV1 decrease in group 1. Mean delays (±SD) of diagnosis in group 1 were 20=14 months (±12) after LT. Specific immunization (group 2) was detected nine months (±32) before LT. A decrease of FEV1 was observed in group 1 at 24 and 30 months after LT (compared to group 3: P=0.05). There was a linear relationship between antibodies rates and FEV1 decrease in group 1. Mean delays between LT and BOS diagnosis were 20=14, 14±13, and 25±11 months for group 1, group 2, and group 3, respectively. Incidences of BOS 0p and ACR were increased in group 2 compared to group 3 (P<0.05).

Conclusions: Anti-HLA immunization is related to early onset of BOS. Specific antibodies probably lead to humoral rejection. Non-specific antibodies indicated sensitized status with increased incidence of ACR.

P-149
LUNG TRANSPLANTATION: TWENTY-YEAR EXPERIENCE AT A SINGLE CENTER WITH 500 CONSECUTIVE PROCEDURES
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Objectives: The purpose of this study was to review a single institution’s long-term experience with lung transplantation.

Methods: We performed a retrospective review from our database after adult and pediatric lung transplantation. Between August 1990 and February 2010, 500 consecutive lung transplants were performed in 495 patients (five retransplants). Indications were chronic obstructive pulmonary disease (n=172), pulmonary fibrosis (n=159), cystic fibrosis (n=60), primary pulmonary hypertension (n=27), bronchiectasis (n=35), lymphohagiolemiomatositis (n=22) and miscellaneous end-stage lung diseases (n=25). Two hundred (40%) were transplanted on Eurocollins® solution and 300 under Perfadex®.

Results: There were 457 (91.4%) adult transplants (recipient age >18 years) and 43 pediatric lung transplants. Mean age of the recipients was 44.8 (r=0.4-67) years. Bilateral and unilateral lung transplant were 348 (69.6%) and 152, respectively.

The global survival was 67.1%, 42.4% and 29.5% at one, five and 10 years. One month survival with Eurocollins® solution and Perfadex® was 78% vs. 86.3%, 49.5% vs. 56% and 37.2% vs. 35.7%, respectively, at 1, 5 and 10 years. Survival divided by indication was 67.3, 38 and 18.7% for COPD, 63.9, 29 and 28.3% for PF, 71.7, 49.5 and 37.2% for CF, 55.6, 35.7 and 28.6% for PH. After division of patients by era (1990-2000 vs. 2001-2010), the number of patients in the older group (45-67 years) has increased from 59% to 66%. The median survival time at the first and second era was 4.5 and 5.4 years, respectively (P<0.001) with a five years survival of 30.4% vs. 50.1%.

Conclusions: In the evolution of our lung transplant program over the last 20 years we have observed a significant improvement in long-term survival during the last decade.

P-150
STAPLERLESS LUNG VOLUME REDUCTION SURGERY PERFORMING BY LIGA-SURE SYSTEM
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Objectives: One of the familiar complications after lung volume reduction surgery (LVRS) is air leak. Within NETT, 90% of patients experienced some air leak with a median duration of seven days. We proposed the LigaSure Vessel Sealing-System for staplerless pulmonary resection to reduce postoperative air leak after LVRS.

Methods: Experimental study: resistance measuring of the sealing line performed by LigaSure System. The Force Triad Standard handset has been used for lung wedge resections exc tempore after lobectomies or pneumonectomies. We carried out measuring of sealing line resistance using the air flow meter (“JKB Tool Company Milford, CT”) by gradually increasing of intrabronchial pressure until the detection of an air leak. In clinical phase we performed eight LVRS using LigaSure only. In three cases operation was done by WATS. We used standard NETT’s inclusion criteria for patients selection. Lung parenchyma resection was done using LigaSure System (Instrunents: LigaSure Impact and Atlas with seal length of 34 mm and 22 mm conformably).

Results: Experimental phase: we performed 49 measurements of sealing line resistance. Average sealing line burst pressure was 460±60 mmHg. Clinical phase: in spite of extent and polysegmental type of lung resection aero- and hemostasis obtained by Ligasure was effective. Median duration of thoracic drainage was 2±1 days in all cases. No prolonged air leaks were detected. The postoperative stay was 10±3 days, respectively.

Conclusions: Minimal registered burst pressure of sealing line performed by Ligasure is significantly higher than maximal physiologic airways pressure. LVRS using Ligasure for lung resection avoids the difficulties encountered in manipulating the stapler within the thoracic cavity and avoids the use of multiple reloadable cartridges thus reducing operation trauma and the costs of the operation without increasing risk of complications.
P.152
UTILITY OF NOVEL THREE-DIMENSIONAL ANGIOGRAPHY CREATED BY 320-ROW AREA-DETECTOR COMPUTER TOMOGRAPHY IN THORACOSCOPIC LUNG RESECTION
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Objectives: The objective of this study was to attempt a clinical trial of video-assisted thoracoscopic surgery (VATS) segmentectomy and lobectomy using distinguished three-dimensional (3D) computer tomography (CT) pulmonary artery (PA)/pulmonary vein (PV) angiography obtained by the state-of-the-art 320-row area-detector CT (ADCT).

Methods: A total of 22 patients with lung lesions investigated for the past eight months (21 with primary lung cancer, two with precancerous lesion, and one with metastatic lung tumor). Seven underwent VATS segmentectomy and 15 VATS lobectomy with lymph node dissection. Distinguished 3D-CT PA/PV angiography was preoperatively obtained by a two-phase dynamic volume scan protocol using 320-row ADCT system in all patients. According to these 3D images, all VATS were performed exclusively with one mini-thoracotomy and another 11.5-mm scope port.

Results: 3D-CT angiography by this protocol could distinguish detailed branching pattern of both PA and PV and facilitated identification of pulmonary vessel anatomy including variant vessels in all patients. Preoperative identification of intersegmental PV anatomy and simulation of parenchymal division for intraoperative navigation was possible in six among seven segmentectomy patients. Variations of vessel anatomy were identified in four among 15 lobectomy patients. The mean size of mini-thoracotomy was 5.5±1.1 cm (range 4.5-8.0 cm). There was no postoperative air leak and the mean duration of chest tube drainage was 3.0±0.6 days in segmentectomy and 2.1±0.3 in lobectomy. Patients discharged home in 13±4.5 days (range 8-30 days) after surgery.

Conclusions: Only in using 320-row ADCT system that affords multiphase dynamic volume scan can 3D-PV angiography be reconstructed in distinction from PA angiography. It was helpful for parenchymal division along the targeted intersegmental PV in simulated and actual VATS segmentectomy. This method might have the potential to increase the safety and efficacy of surgical procedure especially in VATS that is associated with a limited view.

P.153
EFFECTIVE TREATMENT OF POST-PNEUMONECTOMY BRONCHOPLEURAL FISTULA BY CONICAL FULLY-COVERED SELF-EXPANDABLE STENT
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Objectives: The aim of the study was to assess feasibility, efficacy and safety of the use of a conical self-expandable stent for the treatment of post-pneumonectomy bronchopleural fistula.

Methods: Between April 2008 and November 2010, six patients (four males, two females) underwent treatment of post-pneumonectomy bronchopleural fistula by the placement of a tracheo-bronchial conical fully-covered self-expandable nitinol stent (Tracheobronchial Silmet®, Novatech SA, France) with the aim of excluding the bronchial dehiscence from the air flow. Five patients presented with bronchial fistula larger than 5 mm following right (4) or left (1) pneumonectomy. One patient had an anastomotic dehiscence after right tracheal sleeve pneumonectomy. Drainage of the pleural space was performed by a chest tube in all the patients showing absence of empyema.

Results: There was no complication related to the procedure. Immediate resolution of the bronchial air leak was obtained in all the patients. Permanent closure of the bronchial dehiscence without recurrence was achieved in all the patients at a mean follow-up time of 13 months (range 3-32). The bronchial stent was successfully removed in all patients without sequelae 71 to 123 days after its implantation.

Conclusions: The use of the conical self-expandable Silmet® stent has proved as an effective, safe and fast method to treat also large post-pneumonectomy bronchopleural fistulas.

P.154
RISK STRATIFICATION IN THORACIC SURGERY: DO WE REALLY NEED TWO SCORES?
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Objectives: Thoracic surgeons are looking for the right tool to predict the mortality risk of patients undergoing lung resection. This study investigates the suitability of two of the existing risk stratification systems available for predicting mortality in lung resection patients.

Methods: Data of the 288 consecutive patients [165 males and 123 females, median age of 69 (range 37-91) years and median PesoFEV1, of 56 (range 19-116)%] who underwent lung resection between 2008 and 2010 under a single surgeon was extracted from a prospective clinical data base. In-hospital mortality risk scores are calculated for by using Thoracscore and ESOS. We compare this data with actual in-hospital mortality. ROC curve was used to establish how well the systems rank for predicting patients’ mortality.

Results: Surgery was performed for primary lung cancer (82%), metastasis (8%) and non-malignant disease (10%). The operative procedures were pneumonectomy (12%), sleeve resection (9%), lobectomy (48%), segmentectomy (11%), and non-malignant disease (10%). The operative procedures were pneumonectomy (12%), sleeve resection (9%), lobectomy (48%), segmentectomy (11%), and wedge excision (19%). The overall median hospital stay was seven (range 3-65) days. Actual in-hospital mortality was 3.1% (n=9), with four patients requiring admission to ICU to step-up care (1.4%), ESOS and Thoracscore values of means±S.E.M. were 4.9±0.32 and 4.08±0.41, respectively. Area under receiver operating characteristic curve (AUC) values for ESOS and thoracscore were 0.8 and 0.6, respectively. ESOS was reasonably accurate at predicting overall mortality (sensitivity 6% and specificity 87%) while thoracscore was a weaker predictor of mortality (sensitivity 67% and specificity 53%).

Conclusions: Both scoring systems have significance in mortality prediction. Despite requiring less data to be calculated, the ESOS score had better predictive values in our patient population. Because of their low specificity, the use of these scores should be limited to the assessment of outcomes of surgical cohorts, but are not designed to predict risks for individual patients.
Heart failure investigators demonstrated more advanced disease in patients enrolled but did not receive surgery because subsequent investigation demonstrated disease was more advanced. Patients referred from eight other hospitals to the regional thoracic unit were invited into the programme. Patients referred for surgery from eight other hospitals to the program for up to six months.

Secondary outcome measures, e.g. exercise capacity also improved. Hospital readmission rate were significantly better in the intervention group. The groups were matched for lung function, COPD, comorbidities, smoking age of 29 days waiting for surgery. Primary outcome measures of PPC and hospital readmission were significantly better in the intervention group. Secondary outcome measures, e.g. exercise capacity also improved.

Conclusions: A COPD type rehabilitation programme for patients undergoing curative lung resection is feasible and shows promising results and a large multicentre randomised controlled trial is warranted to test efficacy, mechanism and subgroups.

P-157
IDENTIFYING GENOMIC BIOMARKERS OF RECURRENCE IN STAGE I LUNG SQUMOUS CELL CANCER USING NEXT GENERATION SEQUENCING
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Objectives: Chronic obstructive pulmonary disease (COPD), smoking, and exercise capacity are potentially modifiable independent risk factors for developing postoperative pulmonary complications (PPC) after lung resection. This pragmatic enriched cohort study examines the effect of a multidisciplinary care and postoperative complex intervention and its effect on patient and health care outcomes.

Methods: Based on a COPD type rehab template, the programme consists of an exercise programme, targeted smoking cessation therapy, dietary assessment and intervention, and patients’ self-management education sessions. Patients identified as potential candidates for curative lung surgery from two referring hospitals to a regional thoracic unit were invited into the programme. Patients referred for surgery from eight other hospitals to the same unit served as control. Surgery was not delayed by the programme, hence the time spent in rehabilitation varied. Postoperative care was carried as per unit protocol. On discharge, the intervention group returned to the programme for up to six months.

Results: All but one of 29 patients enrolled, completed the programme. A further two patients enrolled but did not receive surgery because subsequent investigation demonstrated disease was more advanced. Patients in the intervention group (n=29) were significantly older than those who did not receive the intervention (n=138); 69 (±6) vs. 65 (±12) years (P<0.001). The groups were matched for lung function, COPD, comorbidities, smoking history and nutritional status. The intervention group received an average of six preoperative rehabilitation and seven educational sessions in the average of 29 days waiting for surgery. Primary outcome measures of PPC and hospital readmission were significantly better in the intervention group. Secondary outcome measures, e.g. exercise capacity also improved.

Conclusions: A COPD type rehabilitation programme for patients undergoing curative lung resection is feasible and shows promising results and a large multicentre randomised controlled trial is warranted to test efficacy, mechanism and subgroups.
Results: Twelve patients with mediastinal tumours (eight males and four females, age 23-72 years), in whom a total 59 contact sites were identified by CT-scans, were prospectively assessed by CMR. Histology was lung cancer in five, thymoma-thymic carcinoma in four, SCLC in one, and thymoma in one. Surgical procedures were: pneumonectomy five, mediastinal mass resection five, extrapleural pneumonectomy one, and exploratory thoracotomy one in one. The negative predictive value was 0.94, positive predictive value 0.80, sensitivity 0.91, specificity 0.86, and accuracy 0.88. CMR imaging always correctly anticipated or excluded invasion of SVC (six cases), supra-aortic vessels (2), aortic wall (7), PA trunk (2), atrial wall (7), ventricular wall (3), oesophagus (2), and pericardium (9) but was less reliable for intrapericardial pulmonary vessels and left anomalous vein.

Conclusions: Preoperative CMR imaging allows for an accurate selection and planning of complex resections in patients with advanced tumours involving mediastinal structures.

P-160 PREPARATION OF THE MEDICAL STUDENT FOR CARDIOTHORACIC SURGERY TRAINING: SIGNIFICANT IMPACT OF A NOVEL SIMULATION-BASED COURSE
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Objectives: As initiatives to broadly implement integrated training programs for cardiothoracic (CT) surgery take place, educational approaches toward the modern medical student (MS) trainee must continue to evolve. MSs are currently exposed to heterogeneous training. It is imperative that we prepare students to more effectively care for patients upon residency matriculation. Thus, we developed and evaluated outcomes of a novel simulation-based preparatory course for MSs.

Methods: Twenty-two MSs matched into surgical residencies and completed a four-week, simulation-based, preparatory course. This course incorporated didactics, simulation, skills labs, and covered areas essential for care of CT surgical patients. Knowledge base, skill acquisition, and readiness were measured through written tests, performance examinations, and self-assessments of confidence levels (five-point Likert scale). Pre- and post-course comparisons were made using t-tests (α = 0.05).

Results: Students possessed significant pre-course measured anxiety related to both cognitive and technical skills needed for management of CT patients. While CT topics were ranked most important by MSs, these were the curricular areas of most substantial weakness. Measured confidence levels rose significantly through course participation. Students demonstrated significant gains in knowledge base. Mean written test scores increased from 54.9% to 86.4% (P < 0.001). Performance of technical skills improved with mean scores increasing from 82.7% to 93.2% (P < 0.001).

Conclusions: MSs have significant baseline deficits in skills necessary for seamless matriculation into CT surgery residencies. This study demonstrates the efficacy of a novel simulation-based, preparatory course in significantly improving student task-specific confidence, knowledge base, and technical proficiency. Because of its emphasis on simulation, this course has internal-tional implications for the modern trainee.

P-161 USE OF A SEALANT FOR PREVENTION OF PROLONGED AIR LEAKS RECORDED BY A DIGITAL CHEST DRAIN SYSTEM AFTER LUNG RESECTION: A PROSPECTIVE RANDOMIZED STUDY
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Objectives: Pulmonary air leaks are a common complication of lung resection, and result in prolonged hospital stay and greater costs. The purpose of this study was to investigate whether the use of a synthetic polyethylene glycol matrix (CoSeal®) could significantly reduce air leaks, detected by means of a digital chest drain system (DigiVent™, Millicore), in patients undergoing lung resection.

Methods: From March 2008 to January 2010, a total of 141 consecu-tive patients undergone lung resections were enrolled in this study after informed consent. Patients undergoing lung resection, compared with standard care (sutures and/or staples alone). Differences in terms of evidence of air leaks, prolonged air leaks and chest tube removal time were investigated.

Results: Group A consisted of 68 patients; group B consisted of 73 patients. Two (2.9%) patients in the CoSeal® group and nine (14.3%) patients in the control group experienced significant postoperative air leaks. A prolonged air leak, defined as a leakage lasting greater than the fifth postoperative day, due to air leakages and/or pleural effusions, was recorded just in one out 69 cases in group B (1.4%) and in eight out of 62 in group A (12.9%) (P = 0.013). Moreover, a chest tube withdrawal time later than the fourth postoperative day, was observed more often in group A (59.4%, 41 out of 69 cases) than in group B (25.8%, 16 out of 62 cases) (χ²: 15.01, P < 0.0001). Differences between the two groups were significant. Chest drains were removed a mean of 5.5 days after surgery.

Conclusions: The use of CoSeal® may decrease the occurrence and sever-ity of postoperative air leaks after lung resection and is associated with a shorter chest tube removal time.
was more common in patients with stage cII or higher as compared to cIA, RR=2.61 (95% CI: 0.76-9.03). Conversion resulted from vascular issues and ventilation difficulties. At least one complication within 30 postoperative days occurred more commonly in the conversion group as compared to nonconverted group, RR=2.15 (95% CI: 1.19-3.88).

Conclusions: In our series: (1) conversion was more common in patients with more advanced clinical stage, and (2) postoperative complication was more common in patients converted to thoracotomy. Thus, advanced clinical stage (known from the literature to be associated with postoperative complication) may confound any analysis of the association of conversion and postoperative complication. VATS anatomic lung resection is safe in selected cases regardless of clinical stage. Conversion may be necessary for safe and oncologically satisfactory resection. Longer-term follow-up is required to assess recurrence and survival rates. Future studies may address the "learning curve" and whether greater surgical experience leads to lower rates of conversion.

P-164 
VIDEO-AXILLAROSCOPY (VAXY) A NEW MINI-INVASIVE TECHNIQUE FOR SURGICAL EXPLORATION OF THE AXILLARY REGION

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Objectives: Access to the sub-clavicular lymph node station by standard approach is deleterious through open surgical approach. We present a new non-invasive technique for axillary lymph node exploration using a video-mediascroscope through axillary access.

Methods: Patient is installed in bedside position with a small pillow under his shoulder with his arm in 90° abduction. A 5 cm incision is performed in the axillary region parallel to the major pectoralis muscle. Penetration in the axillary region is beginning by finger blunt dissection. Then, videomediascroscope is pushing down and dissection is performed by aspiration canula and dissectors. Progression is performed with clavipectoro-axillary fascia, serra-tus anterior and axillary vein as landmarks to reach the subclavicular lymph nodes group beneath the axillary vessels and nerves in the top of axillary region. Lymph node biopsies as well as lymphadenectomy are possible. Results: Two patients were operated by VAXY: a 57-year-old woman treated for a Hodgkin disease presented as a parasternal inflammatory mass. The PET/CT scan performed six months at the end of treatment (chemotherapy) showed hyperactivity on a sub-clavicular lymph node group beneath the axillary vessels. It was an inflammatory lymph node on biopsy and the patient is free of relapse for 15 months. The second patient was a 68-year-old woman suffering from left upper arm phlebitis due to a soft tissue 2 cm mass in the top of the axillary region. Biopsy was performed by VAXY. It was a single node metastasis of breast carcinoma treated nine years ago. Medical treatment was applied. Conclusions: VAXY is a non-invasive reliable technique for targeting biopsy of lymph node in axillary region. It is safer and more accurate than radio-guided techniques. Exploration of this region might increase for treatment of lymphoma and breast cancer and applications might emerge for thoracic outlet syndromes.

P-165 
CELL TRANSFER BETWEEN ARTIFICIAL MEDIA VIA SURGICAL STAPLING

Research and Development, Covidien Surgical Devices, North Haven, CT, USA

WITHDRAWN

P-166 
MALIGNANT PLEURAL MESOTHELIOMA: LEUKOCYTE RECRUITMENT IS NOT REQUIRED FOR DRUG DELIVERY INDUCED BY PHOTODYNAMIC THERAPY IN A HUMAN MESOTHELIOMA XENOGRAFT MODEL

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Objectives: The pre-treatment of tumor neo-veessels by photodynamic therapy (PDT) was shown to improve the distribution of chemotherapy administered subsequently. However, the precise mechanism by which PDT modifies the tumor vasculature is unknown. We have recently shown that leukocyte-infiltration is essential for PDT induced delivery to normal tissue. Our purpose was to determine if PDT could enhance drug distribution in malignant mesothelioma and if a comparable role for leukocytes existed.

Methods: We grew human mesothelioma xenografts (H-meso-1) in the dorsal skinfold chambers of nude mice (n=28). The rolling, sticking and recruitment of leukocytes was assessed in tumor and normal vessels following PDT (Visudyne 400 mg/kg, fluence rate 200 mW/cm², fluence 60 J/cm²) using intravital microscopy. In parallel, the distribution of a macromolecule (FITC dextran, 2000 kDa) administered after PDT was determined. We compared these variables in control (no PDT), PDT+IgG (non-specific antibody) and PDT+pan-selectin antibody (monoclonal P-E-L selectin antibody).

Results: PDT significantly enhanced the distribution of FITC-dextran in mesothelioma xenografts compared to controls. Interestingly, PDT enhanced the leukocyte-endothelial interaction significantly (rolling and recruitment) in tumor and surrounding normal vessels compared to controls. Leukocyte recruitment was significantly down-regulated by pan-selectin antibodies in tumor tissues. However, the extravasation of FITC-dextran in tumor tissue was not affected by suppression of the leukocyte-endothelial cell interaction.

Conclusions: PDT pre-treatment of the mesothelioma vasculature can enhance the distribution of macromolecules drugs administered subsequently. However, unlike normal vessels, leukocyte-endothelial cell interaction is not required for PDT induced leakage.

P-167 
ABLIATION METHOD OF BRONCHIAL MUCOSA AS BRONCHIAL STUMP REINFORCEMENT

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Objectives: To prevent bronchial fistula, lethal complication of postpneumonectomy, we investigated ablation method of bronchial mucosa as bronchial stump reinforcement.

Methods: Female beagles were used for this study. Left thoracotomy was performed under general anesthesia. We used four different bronchial closure techniques. They were sacrificed at two weeks, and were evaluated the histological findings of bronchial stumps (H.E. staining, cGMP staining and VEGF staining). Bronchial stumps closure technique were divided (1) manual suture (3-0PDS), (2) bronchial mucosal ablation+manual suture, (3) linear stapler+manual suture, (4) linear stapler+bronchial mucosal ablation+manual suture.

Results: In all method, all animals were alive and did not occur bronchial stump dehiscence. All bronchial stumps were covered by fatty tissue. In no bronchial mucosal ablation group (1, 3), opposite bronchial mucosa did not conglutinate together even at the site of staple or suture. In bronchial mucosal ablation group (2, 4), opposite bronchial mucosa completely conglutinate together correspondently at the site of ablation. And the ablation site created thick granulation layer including a lot of neovascular vessels and myofibroblasts. VEGF highly expressed in the granulation layer.

Conclusions: In no bronchial mucosal ablation group, even though they were not observed bronchial dehiscence, the sealing methods seemed unstable, because they were only mechanically reinforced by suture and staple. On the other hand, in bronchial mucosal ablation group, they seemed more robust sealing method, because they have not only mechanical reinforcement but also bronchial mucosal conglutination.

P-168 
NON-SMALL CELL LUNG CANCER SUPPRESSES ACTIVITY OF DENDRITIC CELLS TO ESCAPE FROM IMMUNE SURVEILLANCE

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Objectives: Despite introduction of new adjuvant methods, the results of treatment for non-small cell lung cancer (NSCLC) remains unsatisfactory. Immunotherapy is hoped to improve overall outcomes in NSCLC, however, the immune surveillance mechanisms are based on proper function of dendritic cells (DCs). The aim of our study was to assess the influence of NLCLS cell lysate on the DCs maturation process and on the ability of autologous DCs to trigger cytotoxic immune response against lung cancer cells in vitro. Tumour fragments collected from operative specimens of 24 NSCLC patients were cultured with growth factors to obtain tumour cell lysate.
Immature autologous DCs were generated from peripheral blood mononuclear cells (PBMCs) in cultures supplemented with plasma, IL-4 and GM-CSF. DCs maturation was conducted in cultures containing DCs, lymphocytes and macrophages isolated in TNF-α and tumour cell lysate (A) or only-TNF-α (B). Cancer cells stained with carboxyfluorescein succinimidyl ester (CFSE) were added to cultures to assess DCs phagocytic activity as well as lymphocytes activation and cytotoxic features using flow cytometry, confocal microscopy and fluorometry. Results: CFSE fluorescence level, CD69+ lymphocytes count and percentage of cells producing IFN-γ was significantly higher in only-TNF-α cultures than in tumour cell lysate (P<0.007; P=0.042 and P=0.027, respectively). However, the percentage of CD83+ on DCs was significantly higher in tumour cell lysate culture than in only-TNF-α culture (P=0.041).

Conclusions: To avoid immune surveillance, NSCLC induces excessive maturation of DCs and inhibits DCs' phagocytic abilities, which results in profound suppression of tumour-specific immune response. Such inhibited mature DCs are able to activate cytotoxic T lymphocytes, however, the overall anti-cancer efficacy of the immune system becomes severely impaired. Therapies enhancing DCs function may become a promising way to improve outcomes in combined treatment of NSCLC.

P-169
PLATELET RICH PLASMA (PRP) IMPROVES THE HEALING PROCESS AFTER AIRWAY ANASTOMOSIS
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Objectives: To investigate whether platelet rich plasma (PRP) promotes healing and reduces anastomotic complications following airway surgery in a pig model.

Methods: Platelet concentrate was obtained by spinning down the animal’s own blood (60 ml) and collecting the buffy coat containing concentrated platelets and white blood cells. Fifteen adult pigs were randomized into three groups of five animals: 1) sham (cricovectomy alone), 2) non-PRP group (50% trachea resection and end-to-end anastomosis) and 3) PRP group (50% trachea resection and end-to-end anastomosis and PRP application over the anastomosis). Blood samples were taken at baseline and at one, six and 24 h to determine platelet-derived growth factors. All animals were carefully monitored for anastomotic complications, infection or local reactivity. Laser Doppler fluxmetry was performed intraoperatively and at 30 days to assess differences in pre (ápre) and post (áposto) anastomotic blood flow. Anastomosis tensile strength test was also evaluated. Results: All but one animal (non-PRP, pneumonia, nine-day survival) remained alive at study end-point. No local complications were detected. Platelet level in PRP fluid was higher than baseline sample (438±56x10^9 vs. 176±37x10^9/l, P=0.002). TGFB1 was the most prevalent growth factor in PRP (0.92±0.12 vs. 0.50±0.04 ng/ml, P=0.05). VEFG, TGF-b1, EGF immunoassays showed a peak at one and six hours in the PRP group (P=0.05). The PRP group had significantly increased transanastomotic flow (Δtransoperative-Δ30th) compared to non-PRP group (+15.6% vs. +3.8% units, P<0.05) at 30 days and higher stress-strain resistance (P<0.05).

Conclusions: PRP accelerates the onset of the healing process in airway surgery by promoting earlier release of platelet-derived growth factors that stimulate transanastomotic angiogenesis.

Session XI - Videos
Tuesday, 7 June 2011
13:00-14:00

V-170
PEARSON’S OPERATION FOR POST-TRACHEOTOMY SUBGLOTTIC STENOSIS
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Objectives: This video shows a Pearson’s operation for post-tracheotomy subglottic stenosis reparation in a 72-year-old male.

Methods: Past medical history was unremarkable except the tracheotomy performed 20 years ago for severe thoracic trauma with difficult weaning. Patient suffered from short of breath and stridor during light exercise during the last two months. Bronchoscopy showed a subglottic stenosis placed 2 cm beneath the vocal cords affecting the anterior arch of the cricoid, with a predominant ossification of the cartilage in cricoid and tracheal rings. Results: Single-stage resection and reconstruction was carried out following the Pearson operation. Anterior cricoid arch was extirpated repairing the narrow of the subglottic space. This anterior cricoid arch was dissected respecting the anterior tracheal mucosa, undamaged in this case, and preserving the cricoid plate. A small distal membranous flap was used for anastomosis in the posterior wall performed by a running suture. Afterwards end-to-end anastomosis was performed, placing the interrupted stitches between the thyroid cartilage in the front face and the tracheal rings. Conclusions: Bronchoscopic follow-up showed a normal trachea caliber three weeks after operation.

V-171
DIAPHRAGMATIC METASTASIS FROM SOFT TISSUE SARCOMA
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Objectives: The presence of diaphragmatic metastasis from soft tissue sarcoma is extremely rare.

Methods: We present an extensive diaphragmatic resection for metastasis by a left thoraco-phreno-laparotomy in the IX’ intercostal space.

Results: This surgical approach allowed an easier resection of the diaphragm up to inferior vena cava. A Gore-Tex dual mesh was used for the diaphragmatic reconstruction. Conclusions: The thoraco-phreno-laparotomy access allows a complete exposure of the diaphragm and permits an easy reconstruction.

V-172
BRONCHIAL RECONSTRUCTION SURGERY WITHOUT PULMONARY RESECTION
Thoracic Surgery, Cruces Hospital, Barakaldo (Bizkai), Spain

Objectives: Woman, 66-year-old, was diagnosed of pulmonary tuberculosis in 1999. She starts with repeated episodes of pneumonia 10 years later. Circumferential 3 mm stenosis of the proximal third of the main left bronchus was shown in bronchoscopy. We show the film of the resection of the post-tuberculosis stenosis of the main left bronchus, and its reimplantation on the trachea.

Methods: We performed a median sternotomy, opening the left pleura and at 30 days to assess differences in pre (ápre) and post (áposto) anastomotic blood flow. Anastomosis tensile strength test was also evaluated. Results: All but one animal (non-PRP, pneumonia, nine-day survival) remained alive at study end-point. No local complications were detected. Platelet level in PRP fluid was higher than baseline sample (438±56x10^9 vs. 176±37x10^9/l, P=0.002). TGFB1 was the most prevalent growth factor in PRP (0.92±0.12 vs. 0.50±0.04 ng/ml, P=0.05). VEFG, TGF-b1, EGF immunoassays showed a peak at one and six hours in the PRP group (P=0.05). The PRP group had significantly increased transanastomotic flow (Δtransoperative-Δ30th) compared to non-PRP group (+15.6% vs. +3.8% units, P<0.05) at 30 days and higher stress-strain resistance (P<0.05).

Conclusions: PRP accelerates the onset of the healing process in airway surgery by promoting earlier release of platelet-derived growth factors that stimulate transanastomotic angiogenesis.
Fenestrations require frequent often painful dressing changes and are associated with prolonged hospitalisation. We assessed the value of utilising vacuum-assisted closure (VAC) therapy in conjunction with a fenestration in managing a preexistent infected pleural space.

Methods: Five patients underwent open drainage and fenestration of their empyema cavity. A VAC therapy system was inserted the day after surgery. The patients then went on to have the VAC dressing replaced every 7-10 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 avoids the need for daily dressing changes and facilitated early discharge and rehabilitation. Overall the length of hospitalisation was shorter and the VAC therapy facilitated closure of the empyema cavity.

Conclusions: Our observations suggest that VAC therapy used in combination with a fenestration facilitates early discharge and recovery and improves patient satisfaction.

V-174
THORACOSCOPIC LOBECTOMY AND MEDIASTINAL LYMPH NODE DISSECTION IN PATIENTS WITH EARLY STAGE NSCLC
Thoracic Surgery, Blokhin Cancer Research Center, Moscow, Russian Federation

Objectives: Many thoracic surgeons are now advocating the use of minimally-invasive thoracoscopic surgery to perform lobectomies for early-stage primary NSCLC, with the objective of lessening postoperative morbidity while still providing a good oncologic outcome. This series is reviewed to assess these issues.

Methods: Between 2008 and 2009, we performed 51 thoracoscopic lobectomies in 19 women (37.2%) and 32 men (62.8%), with a mean age of 55.3 years. All operated patients had clinical stage I or II of lung cancer. Right upper lobectomy met 14 (27.5%), middle – 8 (15.7%) and lower – 17 (33.3%) from the total number of operated patients. Left completed 8 (15.7%) lower and four (7.8%) upper lobectomy. Of the primary lung cancers, 39 (76.5%) were adenocarcinoma. All patients with primary lung cancer performed hilar and mediastinal lymph node dissection. There are some discussions over approach to VATS. Some authors perform VATS using minithoracotomy in the beginning of an operation, whereas others prefer using exclusively 4-5 ports. In our research we have made minithoracotomy only for removal of a lung for the end of an operation. The mediastinal lymph node dissection is mandatory and integral part of lung cancer surgery.

Results: Thoracoscopic lobectomy and mediastinal lymph dissection was successfully performed in 47 patients (92.1%). Four (7.9%) patients required conversion to thoracotomy to control bleeding in the setting of dense hilar adenopathy. There were no intraoperative and perioperative deaths. Complications included pneumonia - four patients and prolonged air leak - two patients. Median time to chest tube removal was three days, and median length of stay was six days.

Conclusions: Thoracoscopic lobectomy has been proven to be an adequate surgical approach to lung cancer and should be considered as a viable approach to treating selected patients with early-stage NSCLC.

V-175
UNIPORTAL VATS REMOVAL OF BULLET FROM CHEST
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Objectives: We present a video of Uniportal VATS removal of a bullet from a patient who sustained this injury in Afghanistan.

Methods: Uniportal VATS was performed on a bystander who got shot with a stray bullet which pierced his left chest, injured the vertebral spine and spinal cord and got lodged into the right chest wall. He had paraplegia and needed a MRI of the spine prior to Neurosurgical Intervention. Due to the presence of a metallic bullet he could not undergo an MRI and hence he was taken up for Uniportal VATS removal of the bullet.

Results: We had a successful outcome of removal of the bullet by Uniportal VATS with good healing of the chest wound. The patient had a postoperative MRI which enabled him to undergo neurosurgical intervention.

Conclusions: Uniportal VATS must be considered as a treatment of choice. Uniportal techniques should be learnt by surgeons performing three ports VATS.

Session XII - Chest Wall/Diaphragm/Pleura
Tuesday, 7 June 2011 14:00-15:30

O-176
FLAIL CHEST MANAGEMENT: CONSERVATIVE VS. SURGICAL TREATMENT, EARLY AND LATE OUTCOMES
P.M. de la Santa Barajas¹, M.D. Polo Otero¹, C. Delgado Sánchez-Gracian², P. Magdalena Lopez¹, M. Choren Durán¹, C. Trinidad², S. Leal Rulloba³, M. Lozano Gómez¹
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Objectives: Flail chest is one of the most serious forms of blunt thoracic trauma. The outcome of flail chest injury is a function of associated injuries. Non-operative treatment approaches are usually preferred for the flail chest cases. Surgical stabilization is associated with a faster ventilator wean, and shortening ITU stage.

Methods: From January 2005 to December 2010, 98 patients with flail chest were admitted in our institution. Four patients died along the first 5 h and were excluded from the study. Fifty-four patients (Group I) were treated conservatively and 40 patients (Group II) were treated surgically with open reduction and external fixation (ORIF) with STRACOS System® (MedXpert, Heitershaim, Germany). Demographic data, trauma mechanism, ISS, ITU stage, mechanical ventilation and recovery time to back normal activities were analysed in both groups. All survival patients were following up at least six months, recording: needs of analgesia, lung function tests and working days lost for recovery.

Results: Both groups were similar in age, sex, trauma mechanism, extrathoracic injuries, ITU admission, ISS, late mortality and patients with mechanical ventilation. The mean of broken ribs was 11 in both groups, and the mean of ribs stabilized in the surgical group was six (16 left side, 11 right and 13 bilateral). The rib fractures were stabilized only with clips in 27 cases and 13 patients need bars and clips for fixation due to chest deformities mainly. Three patients died in the conservative group, and one treated surgically, the cause of death was multi organ failure. ITU stage was 14 vs. 12 days, z=1.75. Recovery time to normal life 223 vs. 149 days, z=1.77. After nine months all surgical patients were working back vs. only the 68% of conservative patients, z=1.84. Patients treated conservatively needs daily analgesia 244 days (89-360) vs. 84 days (38-122), z=1.89.

Conclusions: Surgical flail chest stabilization by ORIF reduces the ITU stage, the ventilation period. The ORIF reduce needs of analgesia and allows patients comeback to normal life early in comparison with patients treated conservatively. We recommend the flail chest fixation in patients without severe head trauma.

O-177
SOLITARY STERNAL METASTASIS FROM BREAST CANCER: IS THERE A ROLE OF SURGERY?
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Objectives: Carcinoma of the breast is a leading cause of death in women. Metastatic involvement of the skeleton is very common and detection of these lesions has both prognostic and therapeutic sequelae. Sternal involvement is witnessed in 1.9-5.2% of cases with the mainstay of treatment consisting of radiotherapy; however, this is often complicated by previous radiation and sternal instability. Surgery seems to have a role in selected patients. We present our experience of partial or total sternal resection of solitary breast metatases.
Methods: Five patients underwent sternal resection for solitary metastases. Preoperative diagnosis was established with scintigraphy, MRI and fine needle aspiration cytology (FNAC). Total or partial sternectomy was performed in 4 and 1 patient, respectively. Lymph node dissection was carried out in all cases and the sternum was reconstructed with bone cement layered in Marlex mesh. Primary soft tissue closure was possible in all but one patient. The latter had a vascularised rectus abdominis muscle flap to close the defect.

Results: Complete resection of the metastasis was evident histologically in all cases. Routine follow-up revealed one patient with recurrence requiring a completion sternectomy. All patients remained asymptomatic after surgery until they developed distant metastases. Two patients remain alive, 16 and 72 months, after the operation, while the rest died 20, 32 and 61 months later. Conclusions: Meticulous surgery offers successful management of solitary breast metastases to the sternum. Symptomatic relief from pain and skin ulceration is an added benefit as witnessed in our patient cohort. The prognostic benefit is also apparent with three of the patients surviving more than two years and two of them more than five years following resection of their isolated sternal metastases. In conclusion, resection should be performed in all patients with solitary sternal metastases offering both prognostic and symptomatic benefits.

O-178 THE COMBINATION OF PTFE MESH AND HORIZONTAL TITANIUM RIB IMPLANTS: AN INNOVATIVE PROCESS FOR RECONSTRUCTING LARGE FULL THICKNESS CHEST WALL DEFECTS

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Objective: The reconstruction of large full thickness chest wall defects after resection of T3/T4 NSCLC or primary chest wall tumors presents a technical challenge for thoracic surgeons and plays a central role in determining postoperative outcome. When the defect is large, complications after chest wall reconstruction are common with a 27% mean rate of respiratory morbidity. The following is a review of our experience in the combined use of Titanium implants and PTFE mesh in chest wall reconstructions.

Methods: Since 2006, 21 patients underwent reconstruction for wide chest wall defects using Titanium implants and PTFE mesh. In all patients, the reconstruction was achieved by using a layer of 2 mm thickness ePTFE shaped to match the chest wall defect and sewed under maximum tension to re-establish the skeletal continuity. The ePTFE was placed close to the lung and fixed onto the bony framework and onto the Titanium plate, which was inserted on the ribs. The Titanium rib osteosynthesis system was used to re-establish the rigidity of the thoracic wall by bridging the defect.

Results: Eighteen patients underwent a complete BO resection with the removal of 3–9 ribs (mean 4.8), including the sternum in eight cases and the vertebral bodies in five cases. The mean defect area was 198 cm² (range 95–400). Reconstruction required 1–4 horizontal titanium bars (mean 1.9). There were two cases of infection that required re-exploration of the osteosynthesis system in one patient. Only one patient in our series developed a major complication in the form of respiratory failure.

Conclusions: Our experience and initial results show that titanium rib osteosynthesis in combination with Dualmesh can easily and safely be used in a one-stage procedure for major chest wall defects.

O-179 FLUORESCENCE THORACOSCOPY IN DETECTION OF PLEURAL MALIGNANCY

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Objectives: Conventional thoracoscopy, routinely performed in patients with pleural diseases, is not always conclusive in staging of pleural spread. Fluorescence diagnosis (FD) with 5-aminolaevulic acid (5-ALA) has been used in the diagnostic purpose for various malignancies. The impact of fluorescence thoracoscopy on diagnosis and staging of pleural malignancies was examined.

Methods: Twenty-three patients with non-conclusive pleural effusions were enrolled in the prospective single-institution trial. Eligible patients were admitted on 5-ALA per 2 or 3 h before video-assisted thoracoscopy. After conventional inspection with white light, thorough fluorescence investigation of the visceral and parietal pleura was performed (O-LIGHT Auto Fluorescent System; Karl Storz; Germany). Biopsy specimens of both normal and abnormal sites, as determined from white light and FD inspection, were obtained for histologic examination.

Results: There was no morbidity or mortality due to the procedure. A definitive diagnosis was obtained in all cases: malignant mesothelioma in 13 cases, other malignancies (pleural metastases) in eight cases and non-specific inflammation – in three patients. A total of 118 biopsy specimens were available for histologic examination. In 20 patients all pleural deposits (n=60) detected by white light thoracoscopy had bright red fluorescence during FD and were proved to be malignant. Upstaging occurred in 12 patients (57.2%) (unnoticed 21 tumor deposits) due to FD examination. Micrometastases of macroscopically normal pleura were detected only by FD in one patient. Compared to the results of histologic examination of specimens detected by conventional and fluorescence thoracoscopy we obtained 82 true positive, 10 - false-negative, 23 - true negative, 3 - false-positive results. Specificity was 88.4%, sensitivity - 89.1%.

Conclusions: FD using 5-ALA in the pleural cavity is feasible diagnostic tool when used in addition to white light thoracoscopy. It improves visualization of additional lesions or even micrometastases and leads to upstaging in patients with pleural malignancy.

O-180 WARD-BASED, NURSE-LED, OUT-PATIENT CHEST-DRAIN MANAGEMENT: ANALYSIS OF IMPACT ON COST EFFECTIVENESS AND PATIENT SAFETY

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Objectives: Prolonged drainage and air leaks are recognised complications of elective and acute thoracic surgery and carry significant burden on inpatient stay and outpatient resources. Since 2007 we have run a ward-based, nurse-led clinic, for patients discharged with indwelling chest drains. We demonstrate that a dedicated chest drain service is cost effective and safe.

Methods: We reviewed the clinic activity for 12 months (November 2009 to November 2010). Every patient episode was recorded and the data was collected prospectively. At the time of discharge from drain clinic, the whole outpatient care episode was entered into a database. We present a retrospective analysis looking specifically at duration of drain indwelling, the indications, complications and cost efficiency.

Results: The clinic was housed in the thoracic ward with no additional fixed stay and outpatient resources. Since 2007 we have run a ward-based, nurse-led clinic, for patients discharged with indwelling chest drains. We demonstrate that a dedicated chest drain service is cost effective and safe.

Methods: We reviewed the clinic activity for 12 months (November 2009 to November 2010). Every patient episode was recorded and the data was collected prospectively. At the time of discharge from drain clinic, the whole outpatient care episode was entered into a database. We present a retrospective analysis looking specifically at duration of drain indwelling, the indications, complications and cost efficiency.

Results: There was no morbidity or mortality due to the procedure. A definitive diagnosis was obtained in all cases: malignant mesothelioma in 13 cases, other malignancies (pleural metastases) in eight cases and non-specific inflammation – in three patients. A total of 118 biopsy specimens were available for histologic examination. In 20 patients all pleural deposits (n=60) detected by white light thoracoscopy had bright red fluorescence during FD and were proved to be malignant. Upstaging occurred in 12 patients (57.2%) (unnoticed 21 tumor deposits) due to FD examination. Micrometastases of macroscopically normal pleura were detected only by FD in one patient. Compared to the results of histologic examination of specimens detected by conventional and fluorescence thoracoscopy we obtained 82 true positive, 10 - false-negative, 23 - true negative, 3 - false-positive results. Specificity was 88.4%, sensitivity - 89.1%.

Conclusions: FD using 5-ALA in the pleural cavity is feasible diagnostic tool when used in addition to white light thoracoscopy. It improves visualization of additional lesions or even micrometastases and leads to upstaging in patients with pleural malignancy.
TERM SURVIVAL OF PATIENTS UNDERGOING SURGERY FOR NSCLC: F-183

markers and evaluation of their validity in monitoring of minimal systemic therapy. Optimalization of the panel of specific tumor permanent debate. It is our hope that validation of postoperative persistence monitoring of MSD are available. The clinical relevance of MSD is under per-

3. In patients with malignant lymphadenopathy (N1, N2 disease), we found higher expression of CEA and c-met in pulmonary vein blood samples in con-

Results: 1. CEA and LUNX are characterized by high specificity and sensitiv-

3. Recurrences, surgical procedure duration, complications and length of stay, were compared using paired t-test and Fisher's exact test.

Results: Some differences between both groups were found: Recurrences Group A: 11 patients (2.76%) and Group B: 4 patients (1.03%) P=0.116. Operation duration: Group A 46±12.3 min, Group B 37±11.8 P=0.001. Length of stay: A: 4.7±2.5 days, B: 4.3±1.8 days P=0.01. Morbidity: (A: 49, B: 13) Apical residual space A 25, B 4 P=0.001, Prolonged air leak more than seven days: A: 13, B: 8, P=0.378, Pleural effusions A: 6, B: 0, P=0.005, Atelectasis A: 0, B: 1, P=0.493. Reintervention: 24 patients, Group A: 17, Group B: 7, P=0.03.

When compared to pleural abrasion, talc poudrage has lesser operation duration, shorter length of stay and less range of reinterventions. Taking about morbidity talc was better than abrasion in presence of apical residual space or pleural effusions needing drainage. There were no statistics differences in recurrences, prolonged air leak and atelectasis.

Session XIII - Pulmonary Neoplastic
Tuesday, 7 June 2011
14:00-15:30

F-182 DIFFERENT MARKERS FOR MINIMAL SYSTEMIC DISEASE DETECTION IN LUNG CANCER PATIENTS J. Klein1, J. Srbová1, Z. Kolár1, J. Skarda1, R. Skalický1, J. Chudacek1, T. Janašková2, M. Hajduch3 1Surgery, University Hospital Olomouc, Olomouc, Czech Republic; 2University Hospital Olomouc, Olomouc, Czech Republic; 3Hospital Ostrowa-Vítkovice, Ostrava, Czech Republic; 4Palacky University Olomouc, Olomouc, Czech Republic

Objective: Biomarker measurements of minimal systemic disease (MSD) have the potential to monitor the molecular status of tumors without invasive tumor biopsy at the time of treatment selection.

Methods: This is a pilot study to test for the presence of the minimal systemic disease in 69 lung cancer patients undergoing curative surgery. We used real-time RT-PCR method for absolute gene expression quantification of carcinoembrionic antigen (CEA), epidermal growth factor receptor 1 (EGFR1), palate, lung and nasal epithelium associated protein (LUNX) and hepatocyte growth factor receptor (c-met) in peripheral blood, blood from pulmonary veins and samples of bone marrow.

Results: 1. CEA and LUNX are characterized by high specificity and sensitivity for MSD detection in lung cancer patients. 2. MSD positivity using CEA in bone marrow samples strongly correlated with histological grading (GI-GIII). 3. In patients with malignant lymphadenopathy (N1, N2 disease), we found higher expression of CEA and c-met in pulmonary vein blood samples in contrast to N0 patients. 4. Higher expression of MSD markers correlated with higher pathological stage (II-III pTnM): a) by the use of CEA in bone marrow, b) by the use of c-met in peripheral blood samples, c) by the use of LUNX in pulmonary vein blood samples.

Conclusions: These pilot study shows that the MSD detection in lung cancer is technically possible and highly specific and sensitive markers for the monitoring of MSD are available. The clinical relevance of MSD is under permanent debate. It is our hope that validation of postoperative persistence or re-appearance of tumor cells may help to identify patients in need of adjuvant systemic therapy. Optimization of the panel of specific tumor markers and evaluation of their validity in monitoring of minimal systemic disease in lung cancer patients need to be investigated in further studies. This study was supported by grant IGA MZCR NS 10285-3 2009.

F-183 IMPACT OF INTERSTITIAL LUNG DISEASE ON SHORT-TERM AND LONG-TERM SURVIVAL OF PATIENTS UNDERGOING SURGERY FOR NSCLC: ANALYSIS OF RISK FACTORS L. Valtolina, S. Bongiolatti, L. Luzzi, P. Paladini, C. Ghiribelli, M. Ghisalberti, G. Gotti University Hospital Siena, Siena, Italy

Objectives: To determine the impact of interstitial lung disease (ILD) on postoperative mortality and long-term survival of patients with NSCLC undergoing pulmonary resection.

Methods: We reviewed 775 consecutive patients who had undergone lung resection for NSCLC between 2000 and 2009. ILD, defined by medical history, physical examination and abnormalities compatible with bilateral lung fibrosis on high-resolution computed tomography, was diagnosed in 37 (4.8%) patients (ILD group). The remaining 738 patients were classified as non-ILD.

Results: There was no significant difference between the two groups in terms of age (69 vs. 66 years), sex (79% vs. 72% male), smoking history (93% vs. 90% smokers), FEV1% (89% vs. 84%), FVC% (92% vs. 94%), types of surgical resection and histology. The hospital mortality was higher in patients with ILD than in patients without (8% vs. 1.4%, P=0.01). Patients with ILD had a higher incidence of postoperative ALI/ARDS (13% vs. 1.8%, P=0.01). The overall five-year survival rate was 49% in the ILD group and 52% in the non-ILD patients (P=n.s.). At the median follow-up of 26 months (range, 4-119 months), 19 patients were still alive and 18 had died in the ILD group. The major cause of late death was respiratory failure due to progression of fibrosis (n=7). Lower preoperative FVCs (median 72% vs. 85%, P=0.01) was associated with postoperative ARDS, while no preoperative lung function parameters or operative data were identified as predictors of late death.

Conclusions: Major lung resection in patients with NSCLC and ILD is associated with increased postoperative morbidity and mortality. Patients with a low preoperative FVC should be carefully assessed prior to undergoing surgery. Long-term survival is still possible in a substantial subgroup. Thus, surgical resection should be offered to patients with lung cancer and ILD provided that the risk of respiratory failure is kept in mind during the evaluation of such patients.

F-184 AWAKE VIDEOTHORACOSCOPIC RESECTION OF STAGE I NON-SMALL-CELL LUNG CANCER IN MARGINAL SURGICAL CANDIDATES E. Pompeo, F. Tacconi, T.C. Mineo Thoracic Surgery, For Vergata University, Rome, Italy

Objectives: Lung resection through general anesthesia is the treatment of choice of non-small-cell lung cancer (NSCLC) although a number of potentially resectable patients are denied surgery due to advanced age and/or associated comorbidity. Aim of this study is to assess feasibility and outcome of awake videothoracoscopic resection (AVTR) performed by sole epidural anesthesia in marginal surgical candidates.

Methods: This prospective non-randomized trial included 26 patients undergoing AVTR. Eligibility criteria included, peripheral, stage I tumors, age >75 years and/or comorbid conditions scored by the Charlson index. Primary objectives were feasibility and safety rates, which given by the proportion of patients in whom the awake resection was possible (feasibility) and without major complications (safety) at an interim analysis including the first 10 operations. A rate >70% for both factors was deemed necessary to complete the study. Secondary objectives were histologically proven free-resection margin and three-year survival.

Results: Median age and Charlson index were 77 years and 5, respectively. Two patients were converted to general anesthesia. One patient died (3.8%). Surgical procedures included 20 wedge resections and 6 segmentectomies. Overall feasibility and safety rates were 77% each. Median hospital stay was four days. Median tumor diameter was 22.5 mm. Histologically, free-resection margins were found in 22/24 instances (92%). Actuarial three-year survival was 66%. Conclusions: In our study, AVTR resulted in satisfactory feasibility and safety rates; histologically-proven free-resection margins in 92% of patients, and three-year survival rate of 66%. These results suggest that AVTR can be a reliable surgical option in marginal surgical candidates with stage I NSCLC.

F-185 NO-BLAME, NO-SHAME ANALYSIS OF ADVERSE EVENTS AFTER SURGERY FOR LUNG CANCER P.W. Plaisier1, K. Schröten2, R.A. Damhuis2 1Surgery, Albert Schweitzer Hospital, Dordrecht, Netherlands; 2Epidemiology, Rotterdam Cancer Registry, Rotterdam, Netherlands

Objectives: To diminish complication rates after lung cancer surgery, the underlying causes will need to be revealed. With the PRISMA-method (Prevention and Recovery Information System for Monitoring and Analysis), also used for evaluation of industrial and aviation accidents, adverse events can be described and classified leading to insight and possible patient safety interventions.
Methods: The PRISMA-method consists of three main components. First, the complications are described by means of causal trees. At the top of the tree a short description of the event is stated, as the starting point for the analysis. Below the top event, all direct causes that can be identified are mentioned. By continuing to ask ‘why’ for each event or action beginning with the top event, the majority of causes are revealed. In this manner a structure of causes arises, until the root causes are identified at the bottom of the tree. In step two, the identified root causes are classified with the Eindhoven Classification Model (ECM) of PRISMA. The ECM taxonomy distinguishes five main categories of causes: technical, organizational, human, patient-related and other factors. In the final step, all classifications of a group of unintended events are added up to make a so-called PRISMA profile, a graphical representation (for example a bar plot) of the relative contributions of the causal factor categories of the ECM. Prevention strategies can be directed at the most frequently occurring (combinations of) root causes.

Results: The Rotterdam Lung Cancer Working Group comprises 15 hospitals in the southwestern part of the Netherlands and consented with the study of adverse events after lung cancer surgery. Adverse events were defined as 30-day mortality (4%), 90-day mortality (3%), unforeseen N2 (4%), prolonged hospitalization (7%) and development of broncholeural fistula or empyema (4%). Hospitals are visited by a multidisciplinary team of clinicians and adverse events are classified according to PRISMA methodology. Based on the experiences in one of the hospitals, the procedure and results will be described. Final results can only be presented after the last hospital has been visited, in accordance with the liability guidelines for this project.

Conclusions: Our first experiences demonstrate that clinical failure analysis using the PRISMA-method is a powerful tool to study causes of error and to motivate clinicians to change their patterns of care.

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DOES NEOADJUVANT CHEMOTHERAPY INCREASE POST OPERATIVE MORBIDITY AND MORTALITY? LESSON OF THE STUDY IFCT0002

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Objectives: The hypothesis of an increased incidence of postoperative complications after neoadjuvant chemotherapy for non-small cell cancer remains controversial. It would be particularly associated with subclinical parenchymal damages, promoting respiratory complications. Our objective was to verify if the number of preoperative courses favored the occurrence of postoperative complications.

Methods: We reviewed data from 525 patients included in the French national prospective randomized multicenter trial IFCT0002, on preoperative chemotherapy in non-small cell lung cancer. Two groups were formed based on the number of cycles of neoadjuvant chemotherapy administered: group 1 who received 2 courses, group 2 who received 4 courses. The type of resection, the side of surgery, and the data concerning postoperative morbidity and mortality at 30 days were recorded for all patients. Excluded were patients with 0, 1 or 3 courses, and patients who underwent lobectomy or segmentectomy. Appropriate statistics tests were used to compare groups.

Results: The population consisted of 100 women and 425 men. The mild age was 60 years (min: 35-years-old, max: 76-years-old), Group 1 consisted of 370 patients, group 2 of 129 patients. A total of 370 lobectomies were identified including 254 in group 1 and 94 in group 2. In addition, 118 pneumonectomies, 88 in group 1 and 27 in group 2 were identified. The postoperative mortality in group 1 (3.5%, n=12) was not significantly higher than in group 2 (2.5%, n=3). Post operative morbidity in group 1 (20.2%, n=69) was significantly higher than in group 2 (14.5%, n=17), P=0.01. Postoperative morbidity and mortality were not significantly different in groups 1 and 2 for patients who underwent a lobectomy (respectively, P=0.07 and P=0.2), or a pneumonectomy (respectively, P=0.8 and P=0.4).

Conclusions: The number of courses of neoadjuvant chemotherapy does not appear to increase 30 days operative morbidity and mortality in selected patients, such as those included in the trial IFCT0002.
Objectives: International Guidelines on non-small cell lung cancer (NSCLC) suggest the systematic ipsilateral lymph node dissection in curative resected patients. Regardless other factors (e.g. pT-stage, tumor location), this dissection should be done systematically and not selective. But practice patterns among surgeons vary widely.

Methods: In collaboration with the Association of German Tumor Centers (ADT), pseudonymous data from 136,502 patients with lung cancer were integrated into a single database, and data from 11,714 patients (documented and resected stage I-II NSCLC) were selected for the study.

Results: Survival rates were studied as a function of mediastinal lymph node assessment. In 6437 patients (55%), out of the 11,714 patients studied, a systematic ipsilateral lymph node dissection was performed. Three hundred and seventy-two patients (3.2%) had a lymph node sampling, 854 patients (7.3%) underwent mediastinal lymphadenectomy should lead to an improvement in survival rates.

Conclusions: Our retrospective data suggest that mediastinal lymph node dissection has important therapeutic implications for NSCLC patients. Therefore, clinical data of cancer registries in connection with a systematic evaluation can be helpful to determine the role of treatment modalities in the management of NSCLC. And as a consequence of this study, an increase in the rate of systematic lymph node dissection should be done systematically and not selective. But practice patterns among surgeons vary widely.

F-190
BRONCHOVASCULAR VS. BRONCHIAL SLEEVE RESECTION FOR NON-SMALL CELL LUNG CANCER
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Objectives: Bronchovascular sleeve resections are considered to be technically more demanding and to be associated with higher morbidity and inferior long-term survival compared to bronchial sleeve lobectomy in the treatment of centrally located non-small cell lung cancer (NSCLC). Thus, the aim of this study was to analyze comparatively the short-term and long-term results of both procedures.

Methods: We retrospectively reviewed our prospective database of all NSCLC-patients undergoing bronchovascular (BVS) or bronchial (BSR) sleeve resections between January 1999 and December 2008. Patients’ characteristics, morbidity, mortality, survival and possible prognostic factors were analyzed.

Results: The indication was NSCLC for 170 sleeve resections (BSR: n=105; BVS: n=65) out of 213 consecutive sleeve resections. Both groups were statistically equal with regard to age (BSR: 62.4±9.0, BVS: 60.2±9.8 years; P=0.2), gender, co-morbidities, prevalence of induction chemotherapy, number of dissected lymph nodes (BSR: 38.5±12.0 vs. 40.0±14.4), histology and completeness of resection (BSR: 96.7%, BVS: 95.5%; P=0.7), respectively. The short-term results were comparable with regard to morbidity (BSR: 34.3%, BVS: 41.5%; P=0.4), secondary pneumonectomy (BSR: 3.8%, BVS: 0%; P=0.3) and mortality (BSR: 3.8%, BVS: 7.7%), respectively. In the subgroup analyses, BVS in patients aged ≥65 years was associated with high mortality (age <65: 0% (0/39) vs. age ≥65: 19.2% (5/26); P=0.008). In the long-term follow-up, five-year-survival rates (BSR: 52%, BVS: 51%) and mean survival (BSR: 77.8±6.9 vs. BVS: 66.2±7.7 months; P=0.5) were comparable in both groups.

Conclusions: Bronchovascular sleeve resections are as safe as bronchial sleeve resections for the treatment of NSCLC. Both surgical procedures have similar short- and long-term results. Patients aged ≥65 years should be selected very carefully for bronchovascular resections.

F-191
LONG-TERM OUTCOMES AFTER VIDEO-ASSISTED THORACIC SYMPATHECTOMY FOR PALMAR HYPERHIDROSIS: A PROSPECTIVE STUDY COMPARING T3 AND T2-T4 ABLATION
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Objectives: Video-assisted thoracic sympathectomy is a definitive treatment for palmar hyperhidrosis (PH). Different non-surgical therapies exist, but they are usually temporary. This prospective study was conducted to compare long-term efficiency and side effects of single T3 vs. T2-T4 sympathectomy.

Methods: We randomized 100 patients with PH to receive either T3 (n=50) or T2-T4 sympathectomy. All patients were examined preoperatively and were followed-up at 1, 6, 12 and 24 months postoperatively. The two groups were evaluated for comparison of symptom resolution, postoperative complications, severity of compensatory sweating (CS), incidence of symptom recurrence, and satisfaction rate.

Results: There were 71 males and 29 females. The mean age was 29.7 years. The two groups were comparable in gender, age, and severity of sweating. There were no postoperative severe complications or mortality. After one and six months, all the patients confirmed a complete symptom resolution. After six months, 22 T3 patients (44%) presented some degree of CS vs. 26 T2-T4 patients (52%), with no difference in the satisfaction rate. After 12 months, the frequency of severe CS was lower for T3 group (4% vs. 10%, P<0.05) with a superior satisfaction rate in the T3 group (94% vs. 84%). After 24 months, two unexpected recurrences were found in the T3 group (4%); the rate of severe CS was still lower in the T3 group (2% vs. 10%), but the satisfaction rate was similar in the two groups (92% vs. 90%).

Conclusions: The single-level T3 video-assisted sympathetic denervation is a safe and effective procedure to treat primary PH. This method reduces the incidence of severe CS postoperatively without compromising the patient’s satisfaction. However, in our series few unexpected cases of late symptom recurrence have been noticed after T3 sympathectomy. More series with very long-term follow-up are needed to confirm the satisfactory therapeutic effects of the procedure.

F-192
ECTOPIC THYMIC TISSUE IN THE MEDIASTINUM: LIMITATIONS FOR THE OPERATIVE TREATMENT OF MYASTHENIA GRAVIS
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Objectives: The aim of the study was to investigate the distribution of the ectopic thymic tissue in mediastinum and to evaluate its possible relevance to the therapeutic yield of thymectomy in patients with myasthenia gravis.
Methods: In this prospective autopsy study mediastinal dissection was performed in 50 cadavers without any known intrathoracic pathology. The initial dissection was done in the same way as during the maximal transthoracic, transpericardial thoracotomy. At the second stage of this technique fatty tissue located in the sites being out of the reach of surgery was removed: perithyroid, peritracheal, retrotracheal, adjacent to the right and left phrenic nerve, adjacent to the right and left recurrent laryngeal nerve and periaortic. Each specimen was examined pathologically for ectopic thymic tissue.

Results: There were 41 (82%) male and 9 (18%) female cadavers, the mean age was 44.3 years (range: 15-75). Ectopic thymic tissue was detected in 31 of them (62%): in 17 (34%) in locations accessible for surgery and in 22 (44%) in inaccessible locations (in 8 of them there was thymic tissue in both locations). The incidence of thymic tissue in the individual locations were: retrothymopharyngeal - 4 (8%), peritracheal - 6 (12%), retrotracheal - 2 (4%), right phrenic nerve - 2 (4%), left phrenic nerve - 15 (30%), right recurrent laryngeal nerve - 2 (4%), left recurrent laryngeal nerve - 2 (4%) and periaortic - 0.

Conclusions: Incidence of the ectopic thymic tissue in mediastinum is high. Although some improvement of the results of thymectomy may be expected with more aggressive dissection of the left phrenic nerve, the frequency of the thymic foci in anatomical locations being out of the reach of surgery may be the limitation for surgical treatment of myasthenia.

F-193 FALSE-NEGATIVE RATE AFTER 18FDG PET-CT FOR MEDIASTINAL STAGING IN CLINICAL STAGE 1 NSCLC: A PROSPECTIVE STUDY

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Objectives: To assess the false-negative (FN) rate of 18FDG PET-CT in clinical cIA and cIB NSCLC for mediastinal staging.

Methods: Between January 2007 and December 2010, 153 patients [cIA patients (n=79) and cIB patients (n=74)] surgically treated were included prospectively in this study. A thoracic CT-scan and 18FDG PET-CT were performed preoperatively for mediastinal staging and extrathoracic metastases detection. CT-scan was considered negative if lymph nodes were <1 cm in smaller diameter. 18FDG PET-CT was considered negative when the SUVmax uptake was <2.5. No invasive surgical staging was carried out in this group and curative resection plus systematic mediastinal dissection was performed except in the event of unexpected oncological contraindication.

Results: Composite non-invasive staging (CT-scan and 18FDG PET-CT) showed a negative predicted value (NPV) of 92% [CI (83.6–96.8)] in cIA group and 85% [CI (74–92)] in cIB. There were 6/79 (7.6%) FN in cIA and 11/74 (14.8%) in cIB. Multilevel patients were detected in 4 cases all of them in cIB group. The most frequently involved N2 was subcarinal (2 cases) in cIA and 4R and 7 (5 cases) in cIB. Occult (pN2) lymph nodes were more frequent in tumor size ≥ 5 cm (T2B, 15 cases. 4 FN, P=0.045), but no other risk factors for mediastinal metastases were identified (sex, age, clinical stage, histology, tumor location, central or peripherical, P>0.05). Multilevel pN2 was significantly most frequent in cIB group (P=0.03). In T1+1 (31A), NPV was significantly better (NPV=100%) than the other subgroups studied (IA =1 cm and IB), (P=0.05). Conclusions: Composite results for non-invasive mediastinal staging (CT-scan and 18FDG PET-CT) showed a 7.6% of FN in cIA stage. In tumours ≥ 5 cm negative predictive value makes unnecessary surgical staging. However, in cIB the rate of false-negatives (14.8%, 5 multilevel pN2) makes necessary invasive staging, particularly in T2B to decrease the incidence of unexpected pN2 in thoracotomy.

F-194 VIRTUAL MEDIASTINOSCOPY: A NEW DIAGNOSTIC TOOL FOR THORACIC SURGEONS

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Objectives: Cervical mediastinoscopy is the gold standard for staging of patients with suspected or proved lung cancer with enlarged and/or positive mediastinal lymph-nodes at enhanced computed tomography (CT) and position emission tomography (PET) scan. We conduct a pilot study to determine technical feasibility of virtual mediastinoscopy (VM) and to examine clinical utility of this technique.

Methods: VM was based on images obtained by integrated PET scan and helicoidal CT images with a slice thickness of 2.5 mm. Virtual endoscopic images (VI) and virtual VM movies obtained by a specific computer software were used in the cranio-caudal direction to reveal locations of lymph-nodes and great vessels during cervical video mediastinoscopy (CWM).

Results: Virtual images from 28 patients with lung cancer and enlarged mediastinal nodes positive at PET were obtained and accurately evaluated before CVM. Patient group included 18 men and 10 women, aged 48-76 years (median, 67 years). The maximum standard uptake value (SUVmax) of the mediastinal lymph-nodes ranged from 1.8 to 6.5. In all patients the VM enabled better understanding of the spatial and positional interrelationship between the PET positive mediastinal nodes and mediastinal anatomy allowing in all the cases but one a systemic biopsy in mediastinal stations. Based on the detailed virtual simulation on the nodal location, mediastinoscopic biopsy was performed by a Chamberlain’s procedure in one case. A nodal biopsy was performed in a single representative station in 13 patients, in two stations in 10, and in 3 stations in 5. N2 disease was mediastinoscopically identified in 10 patients. Eighteen patients had a benign disease (5 sarcoidosis).

Conclusions: This study showed the feasibility of generating 3-D virtual mediastinoscopic images offering a best preoperative knowledge of the mediastinal anatomy providing the surgeon to make this invasive procedure safer and resulting more accurate.

F-195 MINIMALLY-INVASIVE RESECTION OF THYMIC TUMORS WITH DA VINCI® SURGICAL SYSTEM

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Objectives: Resection of thymic tumors require being complete for oncological reasons and may be technically challenging due to the anatomical proximity of delicate mediastinal structures. An open approach preferentially by sternotomy is still recommended in many cases. Video assisted thoracoscoppy (VATS) is feasible but limited by the two-dimensional vision and the impaired mobility of instruments. We evaluated the Da Vinci® Surgical System (RATS) for resection of various mediastinal pathology especially thymic tumors.

Methods: Twenty patients (10 males, median age 52.5 years) with thymoma well circumscribed on CT and a diameter ≤ 6 cm were resected by RATS alone, those (n=4) with a diameter of 6-22 cm combined in a hybrid procedure with a contra lateral thoracotomy on the side of the main tumor extension. Regular follow-up with chest CT-scans was performed every six months.

Results: Thymoma resection was complete in all, included extended resection of pericardium and/or lung parenchyma in 6 and no intraoperative complications occurred. Pathology included thymoma type AB (7), B1-2 (6), B3 (2) and thymus carcinoma in 2 patients. All B3 thymoma and thymic carcinoma received adjuvant radiotherapy. Median hospitalization time was five days (2-13 days). None of the patients had a tumor recurrence or died during this six year observation period.

Conclusions: Well circumscribed thymomas can be safely and completely resected with the Da Vinci® Surgical System with excellent short and long-term outcome. Selected tumors with large diameters may be resectable using a hybrid procedure with RATS and a thoracotomy.

F-196 RESPIRATORY COMPLICATIONS AFTER ESOPHAGECTOMY FOR CANCER DO NOT AFFECT DISEASE FREE SURVIVAL

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Objectives: Recent studies have suggested that postoperative complications could have a potential negative effect on long-term outcome after esophagectomy for cancer. Because respiratory failures represent the most...
frequent postoperative complication, we have investigated the prognostic impact of these complications on disease-free survival (DFS).

Methods: From a prospective single-institution database of 404 consecu-
tive patients who underwent transthoracic esophagectomy for cancer, we retrospec-
tively analyzed medical charts of all patients with microscopically complete resection (R0, n=383 patients). Complications were graded according to the modified Clavien classification. Respiratory complications were defined as atelectasis, pneumonia or Acute Respiratory Distress Syndrome in the absence of early surgical complications. Patients with grade 5 (postoper-ative mortality, n=43, 11%) were excluded from the analysis. The remaining 341 patients were analyzed for estimation of DFS according to Kaplan-Meier method. Logistic regression analysis was conducted to discriminate predic-
tive factors affecting DFS.

Results: According to the modified Clavien classification, postoperative complications rates were grade 0: 147 (44%), grade 1: 7 (2%), grade 2: 56 (16%), grade 3: 69 (20%), and grade 4: 62 (18%). Five-years DFS rates were not sig-
ificant different between grade 0 (no complication, 38%, n=147) and other grades (grade 1, 2, 3 and 4 (64%, 45%, 56% and 48%, respectively)). Respiratory complications occurred in 107 patients (31%) and the five-years DFS in this sub-
group was 47% compared to 38% observed in grade 0 patients (P=0.75). Clavien classification and respiratory complications did not come out in the univariate analysis of factors affecting DFS. On logistic regression, only three variables affected DFS: pT, pN, and the extracorporeal lymph node involvement.

Conclusions: When postoperative mortality is excluded, postoperative complications do not affect DFS in patients with complete resection. This deserves substantial information regarding subgroup of patients in critical situations where salvage intensive care is questionable.

F-197
WORLDWIDE ESOPHAGEAL CANCER COLLABORATION GUIDELINES FOR LYMPHADENEC TOMY ARE RELEVANT FOLLOWING NEOADJUVANT THERAPY FOR ESOPHAGEAL CANCER
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Objectives: The Worldwide Esophageal Cancer Collaboration (WECC) report-
ed recommendations for number of lymph nodes removed during esophagec-
tomy based upon patients undergoing surgery alone. We sought to determine whether these recommendations are relevant in EC patients receiving neoadjuvant therapy.

Methods: Patients undergoing neoadjuvant chemotherapy followed by transt-
oracic esophagectomy were reviewed. Patients were grouped by optimal vs. suboptimal lymphadenectomy (LAN) per WECC recommendations (pT<4/pN0/T1/T2, pT3/pN1). Cohorts were compared for factors predicting optimal LAN by multivariate analysis and for overall survival (OS) by KM. Results: One hundred and thirty-five patients (aden=100, squamous=35) met study criteria. Ninety-four patients (70%) had optimal LAN (median=30 nodes). Optimal LAN was more likely for tumors with lower ypT (P=0.001) and with dissection of the superior mediastinal and cervical nodes (n=94), compared to dissection of only the lower fields (73.4% vs. 61.0%, P=0.149). On MVA, squamous histology (HR 0.46, CI 0.22-0.95) and optimal LAN pre-
dicted OS (HR 0.62, CI 0.36-1.07), although LAN was dependent upon ypT. Patients not downstaged in ypT (n=66) experienced improved 5 year OS with optimal LAN, while downstaged patients (n=69) had similar 5 year OS no matter the extent of LAN. Similarly, of all patients with ypT3-4 (n=64), those with optimal LAN (n=33) demonstrated a trend towards improved five year OS (45% vs. 34%, P=0.268) compared to those with suboptimal LAN (n=31).

Conclusions: WECC recommendations regarding LAN for esophageal cancer are applicable to patients undergoing esophagectomy following neoadjuvant therapy, particularly those who are not downstaged by T classification. Techniques to enhance extent of LAN should be pursued in this patient popu-
lation to optimize surgical staging and potentially survival.

F-198
MINIMALLY-INVASIVE ESOPHAGECTOMY: DECUBITUS OR PRONE POSITION
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Objectives: Minimally-invasive esophagectomy (MIE) has performed at a few experienced center, it is still a technical challenge for surgeons. Most reports of MIE used left decubitus position, recent studies showed prone position is a safe and effective method. We compared MIE in decubitus position with MIE in prone position to find whether operative position will affect the technical difficulty of the procedure.

Methods: From June 2008 to June 2010, MIE was performed in 88 patients, including 52 patients in prone position and 36 patients in decubitus position. Data for all patients were collected prospectively and stored in a relational database.

Results: No conversion occurred to thoracotomy in both group. Total opera-
tion time and operation time in chest was shorter in prone position group than in decubitus position group (202 vs. 217 min, P=0.016; 77 vs. 67 min, P=0.013) More average lymph nodes were harvested from chest in prone position group than in decubitus group with a mean of 11.6 vs. 8.9 (P=0.033). Anastomotic leak was less common in prone position group than in decubitus position group (7.7% vs. 25%, P=0.024). No different between two groups concerning morbidity and mortality.

Conclusions: Thoracoscopic mobilization of esophagus in prone position had advantage of less operative time, more extensive lymph node dissection and decreased pulmonary injury compared with in decubitus position.
used for bronchial step in pneumonectomy for destructed lung associated with empyema or thoracic visiting window was not described till now. The authors reports a five cases series made between 2009 and 2011, with indications difficulties and tricks.

Methods: Five patients, mean age of 41.5 years, two females, three males, underwent videomediastinoscopic approach of the left main bronchi in the last 14 months, two for pneumonectomy bronchopleural fistulas and 3 prior to pneumonectomy in TB compromised lung, one of them with caggett procedure.

Results: The recovery was uneventful in every case, with the patients full mobilization the following day. The mean operative time was 55 min. One single staple insufficiency was sutured. Minimal required length of the bronchus is 1.5 cm. Conclusion: The mediastinoscopic approach of the main bronchus is a facile but not frequently used technique, first described in 1996. Virgin anatomic mediastinum facilitate the dissection of the trachea and left bronchi through its natural route and enables tracheal mobilization. It warrants minimal surgical trauma. Closure of the main left bronchi before pneumonectomy on extremely disabilitated patients with poor general status improve the future evolution with minimal surgical stress. Video-mediastinoscopy is an easy alternative to the open methods as it allows approaching the left bronchi via the mediastinum. The VAM technique is our choice in selected cases because its specific morbidity is minimal compared with transperiocardial sternotomy or a transthoracic approach. The mediastinoscopic approach before pneumonectomy is a novel option in highly selected patients with destructed lung and poor condition. It warrants minimal surgical trauma; however, one has to be prepared to convert to an open technique immediately.

O-201
THYROID CANCERS WITH LARYNGOTRACHEAL INVASION
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Objectives: Management of Thyroid cancers with laryngotracheal invasion is controversial.

Methods: A retrospective analysis of our database found 69 patients (38 female, mean age 59.6±11.6) in 15 years, of them 42 (61%) were managed by non-resectional methods due to the extensive airway involvement, severe co-morbidities, diffuse metastases, or patient’s preference. Segmental airway resection was performed in 27 (39%) patients; concurrent with thyroidectomy in 17 (immediate group), and as a delayed procedure in 10 referred patients (delayed group), who had been previously undergone thyroidectomy with conservative airway management, like shaving procedures. Follow-up was completed in 81% of patients with mean duration 30 months.

Results: Tracheal or laryngotracheal resection and reconstruction was performed in 18, laryngectomy in 8, and pharyngolaryngectomy in 1 patient. There were two anastomotic dehiscence (7.4%), one resulted in mortality (3.7%), and one combination of bronchoscopic core-out, laser, tracheostomy, and stent placement was performed in 42 non-resected patients with two mortalities (4.7%). Overall 1-, 2-, 3-, and 5-year survival was 85%, 85%, 68%, and 49% in resected group, as well as 56%, 46%, 40%, and 31% in non-resected group (P=0.049). Among resected group, overall 1-, 2-, 3-, and 5-year survival was 92%, 92%, 76%, and 61% in immediate group as well as 72%, 72%, 56%, and 28% in Delayed group (P=0.43).

Conclusions: Complete segmental airway resection during even after thyroidectomy could be safely performed, might be curative, and is associated with improved survival.

O-202
ACQUIRED NON-MALIGNANT TRACHEOESOPHAGEAL FISTULA: EXPERIENCE IN 39 PATIENTS
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Objective: Tracheoesophageal fistula (TEF) secondary to respiratory intensive care have become the commonest type of non-tumoral fistula in adults. Most are diagnosed while patients still require mechanical ventilation. The diagnosis were confirmed by bronchoscopy. Difficulty in treatment results from the need to manage both the consequences of esophagotracheal communication and those of the illness responsible for the fistula.

Methods: Various carefully selected means may be used to achieve this goal. We use a conservative approach until patients are weaned from ventilation. A tracheostomy tube is placed so that the ballon rests below the fistula, to prevent contamination of the tracheobronchial tree. A gastrostomy tube is placed for drainage and a separate jejunostomy tube for nutrition. Esophageal diversion is rarely required. The active approach to protection against esophageal-tracheal reflux is done by lower esophageal exclusion, in some cases. Single-stage repair is accomplished after the patient is weaned from mechanical ventilation.

Results: We have assisted 39 patients with TEF. The defect closed spontaneously in one patient and there were three deaths preoperatively. Surgical repair was accomplished in 35 patients. Simple division and closure of the fistula was done in 19 patients and tracheal resection and reconstruction in the remainder. There were three patients with delayed tracheal stenosis, needing second time tracheal resection and reconstruction. There were four postoperative deaths (11%). One patient with a 6.5 cm of affected trachea was repaired by tracheoeply plus esophageal exclusion and posterior oesophagocobic bypass. One patient with a large destruction of membranous wall, the reconstruction was accomplished by pectoral muscle skin flap. There were four deaths (11%). There were no recurrent fistula.

Conclusions: The 31 surviving patients can feed themselves orally and breathe without the need for a tracheal appliance. One patient needs Montgomery tube by incompetence laryngeal secondary to initial trauma.
O-204
FIVE HUNDRED CONSECUTIVE ISOLATED LUNG TRANSPLANTATIONS; A SINGLE CENTER EXPERIENCE

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Objectives: Center volume was identified in ISHLT registry as an independent risk factor for one-year mortality after lung transplantation (LTx) with a RR <1.0 with >30 cases/year. The aim of the study was to analyze the time interval elapsed to accrue cohorts of 100 recipients and to compare donor (D) and recipient (R) characteristics, hospital mortality, and survival between 5 centiles.

Methods: Between 1 July 1991 and 7 July 2010, 500 consecutive isolated LTx (155 single-S - 345 bilateral-B) were performed in 487 recipients (276 M-211 F; mean±S.D. age 49±13 years). Thirty-three patients have died in hospital (6.6%) from infection: 7; bleeding: 6; neurological problems: 6; post-operative pneumonia: 5; cardiac problem: 1; and graft failure: 1. Hospital mortality decreased and overall one-year, three-year, and five-year survival improved between C1 and C5.

Results: D-age (P<0.0001) and D-ventilation (P=0.002) increased while D-oxygenation (P=0.001) decreased between C1 and C5. Waiting time (P=0.01) and percentage BLTx/SLTx (P=0.0001) increased between C1 and C5. No significant differences were identified for other D&R characteristics. Thirty-three patients have died in hospital (6.6%) from infection: 10; bronchial complications: 8; bleeding: 7; neurological problems: 6; cardiac problem: 1; and graft failure: 1. Hospital mortality decreased and overall one-year, three-year, and five-year survival improved between C1 and C5.

Conclusions: Early and late outcome after LTx improved with increased annual volume despite use of more extended criteria donors. This may in part result from the preferential use of BLTx compared to SLTx in recent years.

O-205
SELECTIVE IN-SITU LUNG PERFUSION PRESERVES TRANSPULMONARY OXYGEN DIFFUSION IN AN ANIMAL MODEL OF NON-HEART BEATING DONOR

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Objectives: Non-heart beating donor is a possible solution to lung donor shortage. However, organ preservation and functional assessment are unsolved problems. We developed an in-situ perfusion model in pigs with selective pulmonary perfusion and assessed quality of lung preservation by measure alveolocapillar exchanges.

Methods: With institutional approval, 6 white large pigs were studied. Cardiac arrest was induced under general anesthesia using whole blood substitution. Canulation was performed into the left and right ventricles for anterograde lung perfusion with aortic and caval clamping to achieve selective lung perfusion using cold Perfadex© (Vitrolife© Goteborg, Sweden). The post capillary, systemic oxygen consumption was mimicked using an extra corporeal membrane oxygenator (ECMO, Primo2X, Sorin Group ©, Milan, Italy) ventilated with an hypoxic gas mixture (N2 86%, O2 7%, CO2 7%). Desoxygenated blood substitute (Steen solution ©, Vitrolife ©, Goteborg, Sweden) was then perfused into pulmonary circulation to challenge the alveolocapillary membrane for 30 min at 3 h, 6 h and 8 h with a concomitant rewarming of the animal and analysis of pre-capillary and post-capillary blood gas at each sequence. Volume-controlled ventilation with a 50% N2O and 50% O2 gas flow was maintained. Pulmonary functional preservation was assessed using pulmonary transcapillary oxygen exchange, with calculation of Arteriovenous Oxygen Content Difference (AVDO2) and Transpulmonary Oxygen output (tpVO2) = AVDO2 × 1.34 × (SaO2-SvO2)+0.003 × (PaO2-PvO2) [Hb: Hemoglobin content (g/dl); SaO2: post-capillary oxygen saturation (%); SvO2: pre-capillary oxygen saturation (%); PaO2: post-capillary oxygen partial pressure (mmHg); PvO2: post-capillary oxygen partial pressure (mmHg) tpVO2=AVDO2×Q=10 [Q=ECMO output (l/min)].

Results: Mean±S.E.M. tpVO2 was 669±282 ml/min at 3 h, 534±232 ml/min at 6 h, and 927±285 ml/min at 8 h. Conclusions: Persistence of transpulmonary oxygen output outlines functional preservation of the alveolocapillary membrane in this in-situ lung preservation model. This innovative approach could be applied to non-heart beating lung donors.
Objectives: Chemical pleurodesis can be palliative for recurrent, symptomatic pleural effusions in patients who are not candidate for a thoracic surgical procedure. We hypothesized that, effective pleurodesis could be accomplished with a rapid method of pleurodesis with superior results.

Methods: Between April 2010 and December 2010, a prospective randomized trial was conducted in 69 patients with symptomatic recurrent pleural effusion. Thirty-five patients were randomly allocated to group 1 (rapid pleurodesis) and 34 to group 2 (standard protocol). A small bore catheter (12 Fr) was inserted percutaneously into the pleural space after radiographic confirmation of free fluid. In group 1, following radiographic confirmation of complete fluid evacuation, talc slurry was instilled into the pleural space. This was accomplished within 2 h of chest tube insertion, unless the drained fluid was more than 1500 ml or if the lung was trapped. After clamping the tube for 30 min, the pleural space was drained for 1 h, after which the chest tube was removed. In group 2, talc slurry was administered when the daily fluid drainage was lower than 300 ml. The intervention was evaluated as ‘successful’ if no or minimal evidence of re-accumulation was noted in one week.

Results: No-complication developed due to talc-insufflation in two groups. Four patients (5.7%) died of pleural-effusion causing diseases. In nine patients, bilateral tube insertions were performed. Complete or partial response was achieved in 32 (91.4%) and 31 (91.2%) patients in group 1 and group 2, respectively (P=0.649). The mean total drainage was 2621 ml in group 1, whereas it was 4242 ml in group 2 (P=0.018). The mean drainage time was 42.5 h and 155 h in group 1 and group 2, respectively (P<0.001).

Conclusions: Rapid pleurodesis using tcalc slurry is safe and effective, it provides quick resolution for recurrent pleural effusions and it can be performed in an outpatient basis.

F-209
EXTRACAVAL LUNG CANCER: A UNDERSERATED PROGNOSTIC INDICATOR IN NON-SMALL CELL LUNG CANCER (NSCLC)

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Objectives: The optimal management of recurrent non-small cell lung cancer (NSCLC) is still a matter of debate. The purpose of this study was to assess the role of extracaval lymph node spread in non-small cell lung cancer (NSCLC).

Methods: A prospective study was conducted in 515 consecutive patients with NSCLC from 2005 to 2011. The presence of extracaval lymph nodes was assessed both macroscopic and histopathological examinations. Positive extracaval nodes (LN1) were defined as lymph nodes beyond the caval vein or aorta.

Results: In total, 214 patients had extracaval involvement (41.7%). Multivariate analysis showed that extracaval lymph node involvement was an independent predictor of survival (HR: 1.80, 95% CI: 1.24–2.63, P=0.002), with a significant impact on 5-year survival (80% vs. 73%, P=0.02).

Conclusions: The presence of extracaval lymph node involvement in NSCLC is an independent negative prognostic factor. Therefore, in future staging systems, extracaval lymph node involvement should be considered.

F-207
FEASIBILITY OF HYBRID THORACOSCOPIC LOBECTOMY AND EN BLOC CHEST WALL RESECTION

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Objectives: En bloc chest wall resection after thoracoscopic lobectomy is feasible and effective in selected patients. The use of a limited counter incision without rib spreading does not compromise oncological efficacy and it may represent an advantage in outcomes, including postoperative morbidity.

Methods: A prospective feasibility study was conducted in 69 patients with symptomatic recurrent pleural effusion. The patients were randomized to group 1 (rapid pleurodesis) and 34 in group 2 (standard protocol). A small bore catheter (12 Fr) was inserted percutaneously into the pleural space after radiographic confirmation of free fluid. In group 1, following radiographic confirmation of complete fluid evacuation, tcalc slurry was instilled into the pleural space. This was accomplished within 2 h of chest tube insertion, unless the drained fluid was more than 1500 ml or if the lung was trapped. After clamping the tube for 30 min, the pleural space was drained for 1 h, after which the chest tube was removed. In group 2, talc slurry was administered when the daily fluid drainage was lower than 300 ml. The intervention was evaluated as ‘successful’ if no or minimal evidence of re-accumulation was noted in one week.

Results: No-complication developed due to talc-insufflation in two groups. Four patients (5.7%) died of pleural-effusion causing diseases. In nine patients, bilateral tube insertions were performed. Complete or partial response was achieved in 32 (91.4%) and 31 (91.2%) patients in group 1 and group 2, respectively (P=0.649). The mean total drainage was 2621 ml in group 1, whereas it was 4242 ml in group 2 (P=0.018). The mean drainage time was 42.5 h and 155 h in group 1 and group 2, respectively (P<0.001).

Conclusions: Rapid pleurodesis using tcalc slurry is safe and effective, it provides quick resolution for recurrent pleural effusions and it can be performed in an outpatient basis.

F-208
SINGLE CENTRE EXPERIENCE OF THORACOSCOPY IN THE SURGICAL RESECTION OF NON-SMALL CELL LUNG CANCER

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Objectives: Calculation of thoracoscore has been proposed as a useful aid to determine immediate operative outcome in general thoracic surgery. The role of thoracoscore in assessing primary lung cancer surgery quality outcomes related to the surgeon, including later outcomes, is not clear.

Methods: Data were collected prospectively on 482 consecutive patients undergoing lung resection for primary non-small cell lung cancer from August 2007 to March 2010. Thoracoscore (TS) was calculated retrospectively. Differences between four consultant surgeons and survival outcomes were analysed.

Results: TS was calculated in 362 patients and 120 patients with missing variables were excluded from further study. Median TS was 1.97 (range 0.5–2.8), the mean 2.48 (S.D. 1.94) and the observed in-hospital mortality was 14 patients (3.9%), TS was higher in the 14 patients suffering in-hospital mortality (4.08 vs. 2.41, P=0.002). TS was higher in patients suffering midterm mortality at 60, 90, 120 days (P=0.05) and at one year (P=0.045). The ranges of minimum, median and maximum TS between surgeons were 0.26 to 0.5, 1.83 to 2.3, 9.55 to 12.57, respectively (P=0.45).

Conclusions: Thoracoscore was higher in those patients dying at time points up to one year. Further work with co-ordination between centres is required to determine the accuracy of TS in predicting mortality and its potential use as a measure of quality of service provision.

F-209
EXTRACAVAL LUNG CANCER: A UNDERSERATED PROGNOSTIC INDICATOR IN NON-SMALL CELL LUNG CANCER (NSCLC)

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Objectives: The optimal management of recurrent non-small cell lung cancer (NSCLC) is still a matter of debate. The purpose of this study was to assess the role of extracaval lymph node spread in non-small cell lung cancer (NSCLC).

Methods: A prospective study was conducted in 515 consecutive patients with NSCLC from 2005 to 2011. The presence of extracaval lymph nodes was assessed both macroscopic and histopathological examinations. Positive extracaval nodes (LN1) were defined as lymph nodes beyond the caval vein or aorta.

Results: In total, 214 patients had extracaval involvement (41.7%). Multivariate analysis showed that extracaval lymph node involvement was an independent predictor of survival (HR: 1.80, 95% CI: 1.24–2.63, P=0.002), with a significant impact on 5-year survival (80% vs. 73%, P=0.02).

Conclusions: The presence of extracaval lymph node involvement in NSCLC is an independent negative prognostic factor. Therefore, in future staging systems, extracaval lymph node involvement should be considered.
F-210
**EXPRESSION OF TOPOISOMERASE IIA AND CHROMOSOME 17 INSTABILITY IN INTRAOPERATIVE SPECIMENS IN NSCLC**

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Objectives: Intraoperative imprints and FNAs offer a fast and accurate method of diagnosis and also a qualitative substrate for immunohistochemical and molecular studies. aberrations of chromosome 17 are common cancers including NSCLC. Topoisomerase family which includes Topo I (20q11), Topo Ila (17q21), Topo Iib (3p24) are enzymes in the nucleus of living cells, which affect the topological structure of DNA. Cells die when topoisomerase is inhibited and for this reason is a target of chemotherapy.

Methods: Using Tissue Microarray Technology we created a 40 tumours TMA. Forty NSCLC (20 adenocarcinomas and 20 squamous carcinomas) and 10 normal lung epithelia (control group) were obtained and embedded into a single paraffin block immunohistochemical stain for anti-Topoisomerase Ila (Ki 51-DACO Corp) combined with CISH for the detection of chromosome 17 instability (Chr 17 Centromeric probe, Zymed kit) and specific gene status was performed in 2 and 5 μm sections and in intraoperative imprints. Finally, using a semi-automated image analysis system we evaluated the nuclear features of number and optical density and the number of signals of chromosome 17 centromeres and gene copies per nucleus.

Results: Significant proportion of NSCLC showed over expression of the marker (18/40) and CISH application showed Topo Ila amplification (high or low level) or deletion of one allele in 11/18 cases. Co-evaluating chromosome 17 instability we observed that 10/18 only amplification while the last 4/18 displayed deletion. We observed that chromosome 17 instability co-appearing with Topo Ila amplification correlates with low differentiation and poor prognosis (P=0.001).

Conclusions: The results indicate that Topo Ila amplification or deletion is a critical genetic event correlating with biological behaviour in NSCLC and determining chemoresistivity. Also intraoperative imprints and FNAs appeared to be more accurate at the evaluation of centromeric and specific gene signals because of the nucleus integrity.

F-211
**HIGH DISCORDANCE BETWEEN EBUS-FNA AND TRANSCERVICAL MEDIASTINOSCOPY IN MODAL STAGING OF NON-SMALL CELL LUNG CANCER**

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Objectives: To study to date has directly compared endobronchial ultrasound guided fine needle aspiration (EBUS-FNA) and transcervical mediastinoscopy (TM) in mediastinal nodal staging of NSCLC, besides one current study with apparent limitations. Methods: From April 2008 to December 2009, simultaneous EBUS-FNA and TM were performed by one and the same dedicated surgeon in 36 patients due to mediastinal lymphadenopathy, of which 26 patients had histologically proven or suspected NSCLC (age 64.5±11.3 years, 12 males). Twenty benign disease. Among malignant lesions, 25 patients were staged as early-disease (I/II), seven as locally-advanced (IIIA/IIIB), and eight (35%) as metastatic or presence of a cT3-4 tumor regardless of mediastinal involvement. Results: Eighty-two patients with proven left sided NSCLC underwent EBUS-FNA, two patients with conclusive EBUS-FNA and TM findings (n=22), the prevalence of N2/N3 disease was 50% (n=11) by EBUS-FNA. Diverging nodal stages were found in six patients (27.3%). Three patients who were N2 negative in EBUS-FNA were upstaged to N2 or N3 by TM, two patients with N2 status in EBUS-FNA were upstaged to N3 by TM. However, one patient who was N2 negative in TM was upstaged to N2 by EBUS-FNA. Conclusions: Our results demonstrate a high discordance between EBUS-FNA and transcervical mediastinoscopy in mediastinal nodal assessment of NSCLC. In most cases, EBUS-FNA resulted in nodal ‘understaging’, suggesting the limitation of this procedure compared to mediastinoscopy as gold standard.

F-212
**THE IMPACT OF EXTENDED MEDIASTINOSCOPY IN LEFT-SIDED NSCLC PATIENTS PRESENTING WITH SUSPECTED N2 DISEASE IN #5 AND/OR #6 STATIONS**

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Objectives: Despite recent advances in non-invasive staging tools, mediastinoscopy remains gold standard for preoperative assessment of mediastinal disease in NSCLC. However, both subaortic (#5) and paraaortic (#6) nodes cannot be accessed via standard cervical mediastinoscopy (SCM). Therefore, optimal invasive staging can only be achieved with addition of extended cervical mediastinoscopy (ECM) in left-sided tumors. Here, we report our experience with ECM and its diagnostic yield additional to SCM.

Methods: Eighty-two patients with proven left sided NSCLC underwent SCM followed by ECM using Lopez’s technique. Indications for addition of ECM were suspected N2 disease in #5 and/or #6 stations based on PET-CT findings or presence of a cT3-4 tumor regardless of mediastinal involvement. Results: Median number of sampled stations was five (range: 3–7) with most frequent one being #4L (n=75). Thirty-two (40%) and six (7%) patients had pathologic N2 and N3 disease, respectively. Addition of ECM has greatly improved the diagnostic yield of SCM and prevented 22 (27%) patients from receiving suboptimal treatment due to unnoticed N2 disease in #5 and/or #6 stations (n=20) or T4 tumor grossly invading mediastinal structures (n=2). One patient required tube thoracostomy owing to a left pneumothorax and one patient died of uncontrollable aortic injury at initial exploration.

Conclusions: Although technically demanding, ECM is a quick and relatively safe in experienced hands and provides valuable information additional to SCM that may guide us to choose the best treatment modality for patients with left sided NSCLC.

F-213
**CORRELATION OF MATRIX METALLOPROTEINASE 9 (MMP9) AND 18FDG-PET AS DIAGNOSTIC MARKERS OF LUNG CANCER**

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Objectives: We aimed 1) to evaluate the diagnostic role of MMP9 in detecting lung cancer and 2) to assess MMP9 correlation with 18FDG-PET standard uptake value (SUV), not been investigated before.

Methods: From January 2008 to October 2010, serum and bronchialalveolar Lavage (BAL) levels of MMP-9 were analysed with ELSA in 60 consecutive patients with suspected lung cancer. All patients were submitted to FDG-PET and SUVs was calculated for each patient. The differences of MMP9 levels between different diagnostic groups (malignant vs. benign lesions), histological type of tumor, and stage were analyzed by Mann-Whitney test; yet, Pearson test validated the correlation of MMP9 levels in plasma and BAL with SUVs.

Results: Forty patients had malignant lesions (15 squamous cell carcinomas, 20 adenocarcinoma, four large cell carcinoma, one microcitoma) and 20 benign disease. Among malignant lesions, 25 patients were staged as early-disease (I/II), seven as locally-advanced (IIA/IIIB), and eight (35%) had metastatic disease (IV). Serum MMP9 levels were significantly higher in malignant than benign lesions (673±182 vs. 309±96, respectively, P<0.0001).

Among malignant lesions, serum MMP9 levels were significantly increased in patients with metastasis (metastatic vs. locally-advanced, P=0.005; metastatic vs. early-disease, P=0.001) but no difference was found between different histological types. BAL MMP9 levels of malignant lesions were higher than those of benign lesions (673±182 vs. 380±196, respectively, P=0.001).
but no-differences were found between different stage and histological types. SUV was significantly correlated with MMP9 levels in plasma (r=0.6, P=0.0001) and in BAL (r=0.3, P=0.01).

Conclusions: Increase of MMP9 is a useful marker of malignancy and in daily clinical practice it may aid to refer patients with suspected cancer for further tumor detection by FDG-PET scan.

F-214
LONG-TERM SURVIVAL AFTER LUNG SPARING TOTAL PLEURECTOMY (LSTP) FOR LOCALLY ADVANCED (IMIG STAGE T3-T4) NON-SARCOMATOID MALIGNANT PLEURAL MESOTHELIOMA
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Objectives: There is a body of opinion that mandates pleurepneumonectomy (EPP) in the radical treatment of locally advanced (T3/4) malignant pleural mesothelioma (MPM). We tested the hypothesis that lung sparing total pleurectomy (LSTP) can be as effective as EPP in locally advanced MPM with reduced risk.

Methods: We analyzed prospective data on 165 patients (128 with epithelioid and 37 with biphasic MPM) with pt3 (n=108) and pt4 (n=57) tumour. Ninety-eight (59.4%) of the patients underwent EPP and 67 (40.6%) LSTP. We compared intergroup differences in: length of stay (LOS), postoperative complications, survival, pattern of recurrence and disease free interval.

Results: There were significantly more postoperative complications after EPP: 67 (68%) vs. 29 (43%) than LSTP, P=0.002. Thirty-day mortality was 7% for EPP and 3% for LSTP (P=0.31). LOS was similar (mean 19 days for EPP, 15 days for LSTP, P=0.19). A difference in progression pattern was noted. In 33 (51%) of EPP patients disease recurred locally compared to 22 (71%) after LSTP. Seventeen patients postEPP (26%) had distal recurrence compared to 10 (17%) after LSTP. Postoperative complications, survival, pattern of recurrence and disease free interval.

Conclusions: We advocate LSTP as the procedure of choice in locally advanced MPM: it offers at least equally good oncological result as EPP in all stages.

F-215
TALC PLEURODESiS AS POTENTIAL FAVOURABLE PROGNOSTIC FACTOR IN MALIGNANT PLEURAL MESOTHELIOMA
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Objectives: The objective in our study was to examine baseline characteristics associated with survival in patients with malignant pleural mesothelioma.

Methods: One hundred and twenty-two patients with histologically proven malignant pleural mesothelioma, during the period 2000-2010 were studied. Survival was evaluated by the Kaplan-Meier method with the log-rank test. Cox regression analysis was used to estimate the hazard ratio for possible prognostic factors.

Results: One hundred and five (86%) patients had complete survival follow-up, 91 died and 14 (13.3%) were alive at the end of the observation period starting from the day of diagnosis. The median survival was 286 days (95% confidence interval (CI), 212-359). Talc pleurodesis was performed on 51 patients and sixteen had surgical interventions (two chest wall resections, two extra-pleural pneumonectomies and 12 decortications). Chemotherapy was used in 41 patients, post-tate radiation in 68 patients and combined therapy in 26 patients. Cox regression analysis identified the following factors as favourable prognostic factors after adjusting for common confounders (age, gender, histology subtypes, smoking and performance status).

Conclusions: Surgical intervention including decortications and extra-pleural pneumonectomy had no effect on survival in this series. Chemotherapy and radiation to port sites independently and in combination were associated with improved overall survival in malignant pleural mesothelioma patients. The important role of talc pleurodesis was a surprising independent determinate of survival and it is the first of its kind highlighting this role but further studies are warranted.

F-216
VATS SEGMENTECTOMY AFTER INTRAOPERATIVE EVALUATION OF SENTiNEL NODES FOR STAGE I NON-SiLLiMiN CANCER
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Objectives: Segmentectomy is a treatment of choice for small-sized non-small cell lung cancer (NSCLC). However, decision-making of procedure during operation is difficult because accurate evaluation of hilar lymph node metastasis remain unclear. We here report the outcome between with and without the assessment of sentinel node sampling in VATS segmentectomy.

Methods: Seventy-four patients with stage I NSCLC were operated by VATS segmentectomy between January 2003 and December 2010. Twenty patients were applied by indocyanine green fluorescence imaging sentinel node biopsy (SNB) and 54 were not. Intraoperative real-time quantitative RT-PCR to determine the expression of CK-19 was used for evaluation of metastasis. Local recurrence rates and survivals were compared in both groups.

Results: Sixteen of twenty patients (80%) in segmentectomy were identified for sentinel lymph nodes. The false-negative rate was 0%. Only one of these patients, RT-PCR by CK-19 expression showed positive in sentinel nodes which meant micrometastases, however, segmentectomy was not converted to lobectomy. Six of 54 patients of VATS segmentectomy without SNB and none of SNB group relapsed. In the relapsed patients without SNB, three (5.5%) were local recurrences and three (5.5%) were distant metastases. Disease-free survival rates between both groups were not significantly different because of short following-up period in SNB group.

Conclusions: Our study demonstrated that VATS segmentectomy with SNB was useful for intraoperative decision-making of segmentectomy with accurate lymph node status.

F-217
CAN EXTRAPELAR PNEUMONECTOMY STBiLL BE OFFERED TO PATiENTS WITH MALIGNANT PLEURAL MESOTHELIOMA AFTER THE MARS TRIAL?
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Objectives: The role of extrapleurapneumonectomy (EPP) has come into question in patients with malignant pleural mesothelioma (MPM). Results of randomised controlled trials (RCT) may be rejected as not applicable to ‘real world’ outcomes, either because RCT outcomes may not be replicated subsequently in clinical practice or because the RCT reported outcomes are inferior to those previously reported in cohort studies. We compared the outcomes of the mesothelioma and radical surgery (MARS) trial with so-called ‘real world’ data.

Methods: Cohorts reporting median survival for patients undergoing EPP in large studies in the last decade were sought. For non-operated patients, median survival in studies published before or during MARS were retrieved. Outcomes for patients in the non-treated arm of a chemotherapy RCT and a large institutional report were also extracted.

Results: Large studies on phase II trials including 45 to 385 patients reported median survival of 10 to 23 months after EPP. Data superpose on MARS EPP survival data and were inferior to the median survival of non-operated patients in MARS. Survival of non-operated patients in two pilot studies for MARS were seven and 13 months which bracketed the 10 month survival in two non-operated cohorts reported during MARS recruitment.

Conclusions: MARS EPP outcomes are comparable with those reported in cohort studies and therefore the evidence from MARS can be relied upon as applicable to ‘real world’ practice. Survival of non-operated patients is highly dependent on the source of the data and factors, such as lead time bias. However, there is no evidence from MARS, cohort studies, or phase II trials that EPP offers a survival advantage over the natural or otherwise treated survival in malignant pleural mesothelioma.
F-218
T3 VS. T3-T4 SYMPATHECTOMY FOR ESSENTIAL PALMAR HYPERHYDROPSIS:
COMPARISON OF EFFECTS ON CARDIO-RESPIRATORY FUNCTION
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Objectives: We aimed to compare T3 vs. T2-T3 sympathectomy on the
hypothesis that a more limited section of sympathectomy chain would have
less negative consequence on cardio-respiratory function.
Methods: Forty-two patients with essential palmar hyperhidrosis were
enrolled. Video-assisted sympathectomy was performed in one stage bilateral-
al procedure with electrocautery of T2-T3 in 21 patients and of T3 alone in 21 patients. Cardio-respiratory function tests were performed before and
at two weeks and six months after sympathectomy. Data before and after sympathectomy in both groups were compared using Mann-Whitney test.
Results: Essential hyperhidrosis was completely relieved in both groups. In T3 group
FEV1 and FVC were significantly reduced at two weeks (%5, P<0.01 and
-6%, P<0.001, respectively), but returned to preoperative values at six months
after sympathectomy (89±3.8 and 88±6.4, respectively). In T2-T3 group
FEV1 and FVC remained significantly decreased respect to baseline value
at two weeks (-6%, P=0.0003 and -8%, P<0.001, respectively), and at
six months of postoperative course (-3%, P<0.01, and -5%, P<0.005, respec-
tively). In T3 group, heart rate was reduced at rest (-2 beats/min, P<0.05)
and at peak exercise (-3 beats/min, P<0.05) at two weeks, but returned to
preoperative value at six months after (79±4.8 and 169±6.3, respectively).
Conversely, in T2-T3 group heart rate at rest and at peak exercise were
significantly reduced at two weeks (-5, P<0.006, and -8, P<0.002, respec-
tively), and remained significantly decreased respect to preoperative value
at six months after (-4, P<0.04, and -5, P<0.03, respectively). All other param-
eters including the subjective reasons for cessation of exercise remained unchanged after sympathectomy in both groups.
Conclusions: The changes observed in cardio-pulmonary function after sym-
pathectomy are probably inherent to the thorascoscopic procedure (T3 vs.
T2-T3) which suggests that cardiac and bronchomotor tone is influenced by sympathectomy innervation.

F-219
A COMPARISON OF STANDARD COMBINED ENDOSCOPIC METHODS WITH
ENDECHOSONOGRAPHY IN DIAGNOSIS OF PULMONARY SARCOIDOSIS
STAGE I AND II - A PROSPECTIVE STUDY
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Objectives: The aim of the prospective study was to compare the diagnostic
yield of standard combined endoscopic methods (SCEM) including endo-
bronchial biopsy (EBB), transbronchial lung biopsy (TBLB) and blind trans-
bronchial needle aspiration (TBNA) with endechochosonography (EE) including
endoscopic ultrasonoud-guided fine-needle aspiration (EUS-FNA) and endo-
bronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA)
in diagnosis of pulmonary sarcoidosis stage I and II.
Methods: In 79 patients suspected of pulmonary sarcoidosis - SCEM and EE
were being performed under conscious sedation. All patients with negative endo-
bronchial procedures underwent mediastinoscopy.
Results: Between 1 October 2009 and 15 January 2011 in 79 patients SCEM
and EE were performed. In SCEM group sarcoidosis was confirmed in 39
(49.5%) patients and in EE group - in 62 (78.5%) patients. Only in one patient
(1.3%) all biopctic methods were negative and sarcoidosis was confirmed by
mediastinoscopy. A diagnostic sensitivity and accuracy of EE was 79.5%,
79.7% and significantly higher than SCEM 50%, 50.6%, respectively (P<0.001).
No complications of all biopctic methods were observed.

F-220
THORACICODORSAL PERFORATOR FLAP FOR INTRA AND EXTRA THORACIC
RECONSTRUCTION
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Objectives: There are few satisfactory flaps for reconstruction of the
thoracic wall and for performing the coverage of the intrathoracic structures.
Through our experiences we wanted to highlight the role of the thoracodora-
sal artery perforator flap (TAP flap) in thoracic surgery especially after
carcinological pulmonary resection.
Methods: From June 2008 to June 2010, 22 TAP flaps were performed. There
were 4 females and 18 males, 56-year-old in average. TAP flap was used four
times for thoracic wall reconstruction and in 18 cases for reinforcement of the
mediastinal structures. Three patients had previous posterolateral thoracotomy
with section of the latsissimus dorsi muscle.
Results: The TAP flap was harvest in all 22 cases even for the three patients
that had a previous thoracotomy. The mean flap elevation and fixation time
was 85±15 min. The average dimension of the flaps was 4 to 8.5 wide and
20 to 25 long. The complications that occurred were: a hematoma due to
the bleeding of the deepithelialized flap, two pulmonary infections treated
medically and one infection of the pneumonectomy cavity treated surgically.
There was no fistula, no seroma.
Conclusions: The TAP flap is a reliable flap in thoracic surgery that can
replace and over pass the classical indications of the latsissimus dorsi muscu-
lucotaneous flap, without having its drawbacks. A multidisciplinary approach
is then essential.

F-221
ADVERSE EFFECTS OF FIBRIN SEALANTS IN THORACIC SURGERY. THE
SAFETY OF A NEW FIBRIN SEALANT: MULTICENTRE, CONTROLLED,
PROSPECTIVE, PARALLEL GROUP RANDOMISED CLINICAL TRIAL
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Objectives: The safety of fibrin sealants has been questioned in the light of
recent reports of adverse effects, mainly thromboembolic events and fatal
anaphylaxis. We evaluated the safety of a new fibrin sealant (FS) in a randomised controlled trial (RCT).
Methods: Multicentre, prospective, open-label phase II/III RCT to evalu-
ate the safety of FS. The trial was approved by the Ethic Committee. FS
includes two components (component 1: fibrinogen; component 2: throm-
bin), each of them subjected to two viral inactivation procedures. Out of
200 screened patients, 185 eligible patients (49 females, 136 males), aged
between 18 and 75 years, undergoing major thoracic surgery were ran-
domised to receive FS (#91 patients) as an adjuvant for air leak control or
no treatment (#94 patients). Safety variables were: percentage of subjects
with adverse events associated with the therapy; formation of antibodies
against bovine aprotinin; vital signs (blood pressure, body temperature,
heart and respiratory rate); laboratory parameters (haematology and blood
chemistry).
Results: None of the adverse events was considered as treatment-related.
Atrial fibrillation (five patients in the FS group and four in the control group)
and hyperpyrexia (five and seven patients, respectively in the two groups)
were the most common adverse events. No patient reported thrombo-
embolic events (pulmonary embolism or deep vein thrombosis) during the in-
hospital stay or within one month from discharge. The formation of bovine
aprotinin antibodies was reported in a total of 34 patients (37.4%) in the FS
group and was not related to any adverse effect.
Conclusions: The present RCT did not show any increased risk of serious and
non-serious adverse events, and of surgical complications, related to the use
of FS. The proportion of treated patients that developed bovine aprotinin
antibodies was in compliance with literature data.

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Objectives: We analyzed whether pulmonary biopsy in patients with interstitial lung disease (ILD) resulted in a change of their medical treatment and/or an inclusion in a clinical trial. Furthermore, we evaluated if that potential change affects their overall survival.

Methods: We used data prospectively collected in a multicenter Spanish register of videothoracoscopic lung biopsy in patients with ILD (Fibla et al., Interact CardioVasc Thorac Surg 2010;11:526). Data related to changes in treatment after lung biopsy, inclusion of the patient in a clinical trial and overall survival were analyzed. We calculated median survival in patients with and without a change in their treatments. ANOVA procedure was used to compare median survival of both groups.

Results: Data from 178 biopsied patients were collected. Fifty-eight of them (32%) were receiving any kind of medical treatment (44% consisting in steroids and immunosuppressors) when pulmonary biopsy was performed. Findings in the biopsy led to a change in the therapeutic strategy in 133 patients (74%). Thirty-eight patients were offered to participate in a clinical trial. Thirty-five accepted and 33 were finally included (18% of biopsied patients). Median survival among patients with and without changes in their treatments was 13 and 17 months, respectively (P=0.23).

Conclusions: Thoracoscopic lung biopsy in patients with suspected ILD led to a treatment modification in a high proportion of patients. However, this fact was not associated to an increase in survival. Only a few patients were offered to be included in a clinical trial.

F-223 THE VALUES OF INTRAPLEURAL PRESSURE BEFORE REMOVAL OF CHEST TUBE IN NON-COMPPLICATED PULMONARY LOBECTOMIES

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Objectives: To measure the values of pleural pressure immediately before chest tube removal after uncomplicated pulmonary lobectomies.

Methods: Prospective observational analysis on 203 consecutive patients submitted to pulmonary lobectomy (12 months, two centers). Multiple pressure measurements were recorded in the last hour before chest tube removal and averaged for the analysis. All patients were seated in a 45° upright position, had a single chest tube (Ch 24) and were not on suction at the time of evaluation. Chest tubes removal criteria: no air leak; pleural effusion <400 ml/day.

Results: The average maximum, minimum and differential pressures were -6.1 cm H2O, -19.5 cm H2O, 13.3 cm H2O, respectively. The average pressures were similar in all types of lobectomies (ANOVA, P=0.2) and ranged from -11 cm H2O to -13 cm H2O, with the exception of right upper lobectomy (-20 cm H2O, all P-values vs. other types of lobectomies <0.05). Similar values were also recorded for maximum pressures (range -4.4 cm H2O to -8.4 cm H2O). Minimum pressures after right upper lobectomies were significantly lower than all other types of lobectomies (-31.6 cm H2O vs. a range from -15.4 cm H2O to -20.5 cm H2O, all P-values <0.01). The average pleural pressure was not associated with FEV1 (P=0.9), DLCO (P=0.2) or FEV1/FVC ratio (P=0.6), when tested with linear regression. Similarly the average pleural pressure was similar in patients with and without COPD (-12.1 cm H2O vs. -13.0 cm H2O, P=0.4). ANOVA test was used to assess differences in pressures between different lobectomies.

Conclusions: The so-called water seal status may actually correspond to intrapleural pressures ranging from -13 cm H2O to -20 cm H2O. Modern electronic chest drainage devices allows a stable control of the intrapleural pressure. Thus, the values found in this study may be used as target pressures for different types of lobectomies, in order to favor lung recovery after surgery.

F-224 RISK OF LUNG VOLUME REDUCTION SURGERY IN AN ESTABLISHED PROGRAMME

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Objectives: There is convincing evidence from observational and randomized studies that lung volume reduction surgery (LVRS) in selected patients with advanced emphysema improves symptoms, pulmonary function, exercise tolerance, quality of life and may prolong survival. However, despite these advantages LVRS is not adequately applied worldwide partially due to a misleading notion of prohibitive risks. After establishing selection criteria’s and optimized treatment algorithms the aim of this study is to evaluate our current mortality and morbidity.

Methods: Two hundred and fifty-two consecutive patients [64 years (31-84), 111 females] with advanced emphysema FEV1 <20% (14-58%), RV/TLCO 0.68 (0.53-0.87), DLCO 34% (10-71%) were treated by thoracoscopic LVRS (77 unilateral) and analyzed from our over the last 10 years. All types of emphysema morphology including the non-heterogeneous type were accepted. The combination of DLCO <20% or FEV1 <20% with homogeneous disease or elevated pulmonary artery pressure was considered as absolute contraindication prospective study.

Results: The 90-day mortality was 1.2% (3/252). Two patients died due to cardiac insufficiencies and one due to respiratory failure. The median drainage time was six days (2-43) and hospitalization was 11 days (4-91). Except one patient who developed cardiac insufficiency, none of the patients had intraoperative complications. One hundred and forty-three (57%) had no complications at all. In 88 (33%) patients pulmonary complications occurred: 60 (24%) had prolonged air leaks (>7 days), 30 (12%) were treated with a reoperation, six (2%) pneumonia, 10 (4%) were temporarily reintubated, two (1%) patients with severe adhesions developed a hemothorax. Thirteen (5.2%) patients had cardiovascular morbidity requiring medical treatment. Conclusions: LVRS in selected patients with very severe emphysema and impaired lung function is safe in a dedicated and experienced centre when the appropriate selection criteria’s are respected. The 90-day mortality with 1.2% is low and the perioperative morbidity is acceptable especially when the possible gain in quality of life is taken into account.

F-225 LVRS FOR NATIVE LUNG HYPERINFLATION FOLLOWING SINGLE LUNG TRANSPLANTATION FOR EMPHYSEMA: WHICH PATIENTS?

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Objectives: Lung transplantation is an established treatment for patients with advanced emphysema. Double-lung transplantation is favoured to avoid complications following single-lung transplantation, including native lung hyperinflation. None the less single-lung transplantation continues due to limited donor organ availability. The aim of this study was to evaluate the preoperative assessment, surgical techniques and outcomes in patients undergoing lung volume reduction surgery for native lung hyperinflation.

Methods: Six patients were identified and retrospective analysis of clinical records performed. Symptoms, preoperative evaluation, perioperative morbidity, length of stay, pulmonary function and survival were examined. Mean follow-up was 12.5 months.

Results: Participants underwent HRT and bronchoscopy with transbronchial biopsy and bronchial washings to exclude alternative causes for deterioration in PFTs. V/Q scan was performed to assess the contribution of each lung to overall function. Measurement of inspiratory airflow resistance in each lung was performed in one case. Five patients underwent multiple wedge resections while the sixth underwent bilobectomy. All patients survived to hospital discharge and mean length of stay was 13.8 days. Functional improvement was demonstrated in all cases at follow-up, with a mean percentage increase of 35.8% in FEV1, and 29.3% in FVC. Symptomatic improvement was also reported by all patients postoperatively.

Conclusions: Lung volume reduction surgery for native lung hyperinflation is an effective treatment strategy with an acceptable level of surgical risk. Patient selection however remains vital. When considering previous reports, the key differences in this study are preoperative evaluation and surgical approach. The non-anatomical multiple wedge excision technique used here was as effective as anatomical LVRS performed in other series. With regards...
to preoperative assessment, the measurement of single lung inspiratory air-flow resistance is of particular interest. We feel that this provides a superior method of differentiating between native lung hyperinflation and obliterate bronchiolitis prior to surgery, thus improving patient selection.

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TRACHEOBRONCHIAL STENOSIS DUE TO WEGENER’S GRANULOMATOSIS: SURGICAL REPAIR AND BRONCHOSCOPIC INTRALESIONAL STEROID THERAPY
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Objectives: To evaluate the results of the surgical repair, bronchoscopy and intralesional steroid therapy in managing subglottic (SGS) and tracheal stenosis (TS) in patients with Wegener’s granulomatosis (WG).

Methods: From November 1991 to October 2010 seven patients with WG and airway stenosis underwent tracheobronchial and/or tracheobronchial procedures were enrolled in a prospective study. In all patients clinical, serological and histopathological data confirmed the diagnosis of WG.

Results: Seven patients (four females, three males) with airway compromise due to WG were treated. The average age at the time of tracheobronchial stenosis presentation was 31±14.42 years. Four patients presented TS while the remaining patients had extratracheal manifestations affecting eyes, lungs, kidneys and joints. Within the airway, SGS was observed in five patients and distal TS with concomitant bronchial lesions in two patients. The median follow-up after the first surgical treatment was 68±29 months. All patients underwent rigid bronchoscopy with dilation as the initial therapy. Three patients underwent elective resection of the stenosis due to mature fibrotic scars; one patient required upper tracheal anastomosis precision transglottic Montgomery stent; one patient precise right pneumonectomy and carina resection, and one patient underwent distal trachea resection. There has been no evidence of local disease recurrence during follow-up period among these patients. The remaining four patients required periodical dilatation bronchoscopy for SGS. Airway compromise was treated with intral nasal steroid therapy in three patients. Following this therapy, the median intervention free interval was 12 months. There has been no mortality.

Conclusions: Surgery should be directed towards reconstruction of mature adult airway scars once active WG has been controlled. Dilatation bronchoscopy with intralesional steroid therapy is an effective strategy for subglottic tracheal WG obviating systemic immunosuppression in selected patients.

F-227
ERGONOMICS IN THORACOSCOPIC SURGERY - RESULTS OF A SURVEY AMONGST THORACIC SURGEONS
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Objectives: Minimally-invasive thoracic surgery is becoming more common performed. However, the frequent and prolonged use of thorascopic equipment raises the ergonomic risk, which may cause physical distress. The relationship between ergonomic issues and physical distress has never yet been investigated amongst thoracic surgeons.

Methods: A questionnaire was designed. Personal-, product-, and interaction-factors were collected. The survey was created online. An invitation-mail was sent to all 1071 ESTS-members.

Results: The response rate was 21.1%, the completeness rate 91.7%. Ten percent were women. Forty-six percent surgeons suffer from moderate to severe neck pain, 42% complained about back pain subjectively due to bad monitor-position (44%) more than table-height or instrument-management. Seventy-four percent of the respondents have severe neck pain, 42% complained about back pain subjectively due to bad monitor-position (44%) more than table-height or instrument-management.

Conclusions: This study represents the opinion of 21% ESTS-members. 99.5% respondents indicate that ergonomics are important. But only 5.6% indicate that they are familiar with ergonomic guidelines. The way monitors and the operating table are used illustrates this lack of guideline-knowledge.

Therefore, more attention showed be paid to ergonomics by surgeons and industry.

F-228
VALIDATION OF A MODIFIED SCORING SYSTEM FOR CARDIOVASCULAR RISK ASSOCIATED WITH MAJOR LUNG RESECTION
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Objectives: The revised cardiac risk index (RCRI) has been modified based on factors specific to thoracic surgery (ThRCRI). We explored the accuracy of this modified scoring system in predicting cardiovascular morbidity after major lung resection.

Methods: We analyzed outcomes from a database of patients undergoing major lung resection 1980-2009. ThRCRI score was based on weighted factors for serum creatinine, coronary artery disease, cerebrovascular disease, and extent of lung resection. Missing values were managed using multiple imputation. Adverse outcomes included pulmonary embolism, myocardial infarction, cardiac arrest, pulmonary edema, and cardiac death.

Results: A total of 1255 patients (mean age 61.8 years; 649 men) underwent lobectomy or bilobectomy (1070; 85%) or pneumonectomy (185; 15%) for cancer (1037; 83%) or other problems. Severe cardiovascular complications occurred in 30 patients (2.4%), an incidence similar to that in the published derivation group (3.3%). ThRCRI scores in patients with and without CV complications were 0.5±0.081 and 1.43±1.01 (P=0.001). Score categories yielded incremental risks of cardiovascular complications (0: 0.9%; 1: 1.3%; 4.5%; ≥2: 12.8%; P=0.001). The Hosmer-Lemeshow test demonstrated no significant difference between expected and observed outcomes (P=0.11).

Conclusions: The incidences of postoperative cardiovascular complications were similar in the published derivation group and the current validation group. The ThRCRI score successfully stratified risk for postoperative cardiovascular events after major lung resection in the validation group. The expected risk in the validation group was similar to the observed risk, indicating that ThRCRI accurately predicted specific risk rather than just relative risk. Further evaluation of the utility of this scoring system is warranted.