89. From the laser through the stent to the valve: the broad spectrum of interventional pneumology

P660

Confocal laser endomicroscopy in diagnosis of solitary and multiple pulmonary nodular infiltrates

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Background: Probe-based confocal laser endomicroscopy (pCLE) is a new method used during bronchoscopy by means of special miniprobe Alveoflex and based on the visualization of intraalveolar structures which possess autofluorescence. Till now the only lung pathology for which specific diagnostic signs are established at pCLE is alveolar proteinosis.
Aim: To compare the visual signs of a healthy and pathologically changed lung tissue received at pCLE in patients with infiltrative and local lung nodules with the proved histologic diagnosis.
Methods: 36 patients have been undergone multispiral CT to detect the focuses of lung lesions. pCLE has been performed to each patient first in healthy segments, and then in the zone of abnormal findings with photofixing of intraalveolar images and semi-quantitative score. Morphologic diagnosis was ensured by video assisted thoracoscopic lung biopsy.
Results: Patients diagnoses have been as follows: sarcoidosis (17), central lung cancer (1), pneumonia (5), usual interstitial pneumonia (1), bronchioloalveolar carcinoma (BAC) (4), other peripheral tumors (8). In all patients with BAC the changes of an intraalveolar image in comparison with healthy segments have been revealed. It has been structural disorganization of collagen and elastic fibres. For other diseases we haven't found any significant difference between healthy and target affected alveoli.
Conclusions: pCLE could be used as an additional method of noninvasive diagnostics of BAC in vivo.

P661

Airway injury after intubation for lung surgery: Double lumen tube compared to EZ blocker

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Background: Double lumen tubes (DLT) or bronchial blockers (BB) are used for isolated lung ventilation. DLT's can be positioned faster and remain firmly in place, but are more difficult to introduce. BB's are more difficult to position and need more frequent intraoperative repositioning. The design of a Y-shaped BB, the EZ-Blocker (AnaesthetIQ BV Rotterdam Netherlands, EZB) combines advantages of both techniques. This randomized study investigated efficiency, efficacy and safety of DLT's *vs* EZB and focused on airway injury caused by intubation.
Methods: 100 patients were randomly assigned to DLT or EZB group. Incidence and severity of damage to laryngeal, tracheal and bronchial structures were analysed by bronchoscopy before and after surgery. All procedures were recorded and injury was scored by a pulmonologist blinded for intubation type. Further the ease and time of placement, incidence of malpositions, quality of lung deflation, postoperative hoarseness and sore throat were assessed.
Results: There was a significantly higher incidence of airway injury after DLT compared to EZB. Marked tracheal and bronchial hematomas were found in 58% vs 26% (P=0.002) and 31% vs 6% (P=0.007). No differences were found in vocal cord and main carina injury. Placing single lumen tubes and EZB's took more time but was rated easier. The majority of EZB's and DLT's were initially malpositioned (42/49 DLT, 37/50 EZB). Lung deflation was comparable. Fewer patients in the EZB-group complained of sore throat.
Conclusions: The EZB is an efficient and effective device for lung isolation and causes less injury and sore throat than DLT. Bronchoscopic control is recommended for both devices to ensure correct positioning.

P662

Preoperative endobronchial photodynamic therapy improves surgical radicalism for locally advanced NSCLC

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Objective: We describe the result of prospective randomized trial comparing neoadjuvant chemotherapy with and without endobronchial photodynamic therapy (PDT) followed by surgery for locally advanced NSCLC.
Methods: From Jan 2008 to Dec 2011, 42 pts with stage III central NSCLC (main bronchus/distal trachea involvement) were randomized to either endobronchial PDT or no PDT. PDT was done with photosensitizer chlorine E6 and 662 nm laser light before each of the three courses of chemotherapy. Patients assigned to PDT (n=21) and no PDT (n=21) were similar with respect to age, sex, tumor stage, and histology.
Results: No PDT complications were observed. After neoadjuvant treatment partial remission revealed in 19 pts (90%) in PDT and 16 pts (76%) in no PDT group, these patients underwent thoracotomy. Surgery in PDT group: 14 pneumonectomies and 5 lobectomies; surgery in no PDT group: 10 pneumonectomies, 3 lobectomies and 3 exploratory. There was one postoperative death in each group. Completeness of resection was significantly higher in PDT (R0-89%, R1-11%) vs. no PDT (R0-54%, R1-46%) group.
Conclusions: Combination of chemotherapy with endobronchial PDT increases effectiveness of neoadjuvant treatment and surgical radicalism for locally advanced central NSCLC.

P663

Clinical experience with a new self-expandable metal stent, SILMET, in tracheo-bronchial stenosis

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Introduction: The Implantation of Tracheo bronchial stents is a recognised treatment option in the management of airway disease. However, stent related side effects and complications are still an unresolved issue and are object of intense investigation. Research is currently focusing on the delivery mechanism and on biomaterials.
Aims: We evaluate the clinical result and effectiveness of the Silmet stent for treatment of benign or malignant bronchial disease.
Methods: Clinical data were collected retrospectively from 21 consecutive patients. Each patient implanted were underwent to clinical monitoring, according to our protocol, consisting in endoscopic and microbiological testing at 1 day, 1 month, 3 months and 6 months after the procedure. For the evaluation of mucus plugging we used our 4 points endoscopic scoring: 0 = no secretions; 1 = moderate amount of secretions easily removable by suction; 2 = severe amount of secretions removable using a biopsy forceps, mucolytic agents instillations or other devices in addition to the suction; 3 = complete stent obstruction or deposit of thick and non-removable secretions.
Results: At the end of follow-up we recorded a single death which was not respiratory related. In one patient under chemiotherapy we observed dislocation of the stent after significant tumor mass regression. No patient developed airways stenosis or trauma, airway wall damage or major complications. Nineteen patients had endoscopic score 0 and two patients score 1 in the last visit. One patient had a mild not obstructing granuloma.
Conclusions: These new Silmet stent have proved effective and free of severe complications in the treatment of tracheo-bronchial stenosis.

P664

Incidence and management of anastomotic complications after bronchial resection: A retrospective study

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Background: Bronchial resection and re-implantation in the surgical management

of lung cancer are intended to spare lung parenchyma, with curative intent. We studied the incidence and management ofanastomotic complications after such procedures.
Methods: We retrospectively reviewed charts of patients referred to our center for lung tumors, who underwent bronchial resection and re-implantation from 1991 to 2011,
Results: A total of 108 patients were included. Sixty eight percent were male, and mean age was 58 years. Sleeve lobectomies were performed in 100 patients, bronchial resections without lung parenchymal resection in 8 patients. Squamous cell carcinoma represented 46.3%, carcinoid tumors 22.2%, and adenocarcinomas 18.5%. Mean time between surgery and the first bronchoscopic examination was 4.47 days, with anastomotic abnormalities detected in 20.4%. Twenty three patients underwent therapeutic bronchoscopy for malacic or fibrotic bronchial stenoses in 9 cases, for dehiscences in 7, for obstructive granulomas in 3, and for bronchopleural fistulas in 3. Endoscopic treatment consisted in stent placement in 5 cases, mechanical dilations in 3, laser treatment for one case of bronchomalacia, and resection of granulomas in 3. No risk factors were identified as predisposing for bronchial complications. There was a trend towards lower 1-year survival in patients with bronchial complications compared to those without (71.9% vs. 83.4%, p=0.114).
Conclusion: Bronchial resection and re-implantation is a surgical procedure associated with an anastomotic complication rate of 21%. Regular endoscopic surveillance is advised in order to detect and treat early complications.

P665
Optimizing the treatment of inflammatory tracheal stenosis according to a morphometric classification
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Introduction: A multivariable classification with its corresponding multimodality treatment has not been described in inflammatory tracheal stenosis.
Objectives: 1. To describe the distribution of patients according to a morphometric classification 2. Identify the rate of success according to its corresponding treatment.
Method: Only patients with post intubation (PITS) or idiopathic inflammatory tracheal stenosis were included. Other benign non inflammatory diseases, granulomas and neoplasms were excluded. Patients were classified based on 3 endoscopic variables (Table 1). Treatment was selected according to the grouping of these variables.
Results: 40 patients were included: PITS in 87.5%, idiopathic stenosis in 12.5%. Distribution of patients, treatments and rate of succes are presented in Table 2.
Endoscopic treatment was performed initially in 95% of patients. The treatment was successful in 45%, 26% underwent further surgical treatment and 29% needed a permanent canula or tracheal silicon stent.
Of the 12 patients who underwent surgery, 2 received no prior endoscopic treatment, and 3 required endoscopic treatment after surgery. Surgical treatment was successful in 83%. 17% of operated patients had tracheal restenosis.

Table 1: Classification criteria for inflammatory stenosis of the trachea

Structure (S) Structure of the tracheal wall		Diameter (D) Internal diameter at the point of minor lumen		Length (L) Axis of the larynx-trachea	
S1	Acute-subacute inflammation	D1	>10mm (area >25 µ)	L1	Stenosis ≤ 2cm
S2	Organized scar fibrosis	D2	8-10 mm (area 16-25 µ)	L2	Stenosis between 2-4 cm
S3	Malacia	D3	≤ 8mm (area ≤ 6 µ)	L3	Stenosis > 4cm
S4	Tracheoesophageal fistula				

Table 2: Treatment according to morphometric classification grouping

Classification	N (%)	Successful treatment				Failure treatment	
		E	S	E+S	TOTAL (%)	E	S+E
S1D2L1	2 (4.9)	1	-	1	2 (100)	-	-
S1D3L1	7 (19.5)	4	-	1	5 (71)	2	-
S1D3L2	6 (15.0)	1	-	2	3 (50)	3	-
S2D2L1	1 (2.4)	1	-	-	1 (100)	-	-
S2D3L1	16 (39.0)	9	-	3	12 (75)	2	2
S2D3L2	5 (12.2)	1	-	2	3 (60)	2	-
S3D2L3	1 (2.4)	-	-	-	0 (0)	1	-
S3D3L1	1 (2.4)	-	-	-	0 (0)	1	-
S4D2L1	1 (2.4)	-	1	-	1 (100)	-	-
TOTAL	40 (100)	17	1	9	27 (67.5)	11	2

E: endoscopic treatment / S: surgery

Conclusions: 1. The more frequent tracheal stenosis group was S2D3L1 (39%). 2. Success rate with this multimodality approach was achieved in 68% of the patients.
Funded partially by FUCAP.

P666
Safety of percuteneous dilation tracheostomy in obese critically ill patients when performed with bronchoscopy assistance
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Introduction: Intensive care unit (ICU) patients, mainly those in need of prolonged mechanical ventilation require tracheotomy. Obese critically ill patients are at greater risk for requiring intubation and prolonged mechanical ventilation. Percuteneous dilatational tracheotomy (PDT) is a well-established procedure that can be performed at the bedside by an intensivist with less surgical equipment required.
Goal of study: To evaluate the safety of performing PDT with bronchoscopy assistance in obese patients requiring prolonged mechanical ventilation.
Method: Sixty patients 17-79yrs of age, 23 females and 37 males with body mass index 38±8 kg/m^2 underwent PDT with bronchoscopy assistance due to prolonged endotracheal intubation between December 2009 and January 2012. The procedures of percuteneous dilatation tracheotomy with guide wire dilator forceps (GWDF) were done bedside under general anaesthesia in the ICU. Operative and post operative complications were observed.
Results: Overall complication rate was low and occurred in 10 patients, there was no procedure-related mortality. Subcutaneous emphysema without pneumothorax occurred in three patients, two patients had a transitory hypotension related to sedation and five patients had peristomal oozing.
The mean time for procedure completion was 15 minutes, no patient required conversion to surgical tracheotomy. The bronchoscopic examination that was performed in 24 of the patients 20 days after tracheotomy tube removal showed no scar formation.
Conclusions: PDT with bronchoscopic guidance is safe for obese critically ill patients that can be done by an experienced intensivist at the bedside setting.

P667
Endoscopic balloon dilatation in idiopathic tracheal stenosis – An Australian experience
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Introduction: Idiopathic tracheal stenosis (ITS) is a rare inflammatory disease of unknown etiology which is characterised by stenosis of upper part of trachea. Single stage laryngeotracheal resection has been the definitive treatment but endoscopic methods are gaining popularity. Balloon dilatation as the treatment for ITS, is a relatively new procedure with limited data available regarding its efficacy.
Aim: To analyse the usefulness of endoscopic balloon dilatation for treatment of ITS.
Material and methods: Retrospective single centre study of patients treated with endoscopic balloon dilatation, for ITS.
Results: Six patients were treated for ITS, with balloon dilatation between 2008-2011. All the patients were females and the average age was 51 years (Range 29-77). The average time between the onset of symptoms and diagnosis was 27 months. Pulmonary function test data could be located for only three patients and all three had evidence of fixed airway obstruction in their flow-volume loops. Bronchoscopy showed proximal stenosis in majority of cases (5/6 i.e. 83%). The majority of stenoses (5/6 i.e. 83%) were circumferential in appearance. Balloon dilatation was effective in increasing tracheal lumen and improving symptoms in all (100%) the patients. All the patients tolerated the procedure well and there were no significant complications. Fifty percent (3/6) of patients required repeat dilatation (average number of dilatations 3.3) and the average interval between repeat procedures was 7 months.
Conclusion: Endoscopic balloon dilatation is an effective, low-risk procedure for treatment of patients with ITS.

P668
Treatment of benign airway stenosis: One center experience
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Introduction: Although surgical treatment remains the standard initial treatment for benign tracheal stenosis (TS), the emergence of certain situation, such as contraindications for surgery or recurrence of TS,prompts for further therapeutic solutions.
Objective: To assess the effectiveness and long-term outcome of patients (pts) that underwent combined treatment modalities for the palliation of benign TS.
Methods: Were included 73 pts,in this retrospective longitudinal study,between 1/1/96 and 30/6/11,in the Pulmonology Department of Instituto Português de Oncologia de Lisboa de Francisco Gentil.
The most frequent ethiologies were post-intubation TS (74%) and idiopathic TS (14%).Membrane type of stenosis was the most frequent (51%),followed by com-

plex type (23%) and bottle neck type (18%).Sub-glotic stenosis was the most frequent location (57%).
Results: Primary bronchoscopic treatment was the initial approach in 44%,followed by surgical in 37%.Different kinds of bronchoscopic procedures were used:bronchoscopic mechanical dilatation (62%),balloon dilatation (47%),photocoagulation with Nd-Yag laser (25%),electrocautery (37%) and tracheal stenting (44%).
55% of the 32 pts scheduled for initial bronchoscopic treatment were subsequently treated surgically due to stenotic recurrence. 37% of pts treated initially by surgery,were subsequently treated bronchoscopicaly due to anastomotic reestenosis or obstructive granulation tissue. After treatment,according Grillo's response criteria,69% of the pts had good results,15% had satisfactory results and 15% had therapeutic failure.
Conclusions: Interventional bronchoscopy plays definitive role in the treatment of TS,either as the primary choice or in the resolution of post-surgical complications.

P669
Argon plasma coagulation in treatment of post intubation tracheal stenosis
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Background and objectives: Acquired tracheal stenosis can be created by various causes.The most common cause of acquired non-malignant tracheal stenosis is endotracheal intubation,even for a short period.Argon plasma coagulation (APC) is a non-contact method of thermal hemostasis which can be used easily and fast and has low depth of penetration.Therefore,we decided to evaluate efficacy of this method in treatment of Tracheal stenosis.
Methods: This study is single blinded.Subjects were patients with tracheal stenosis after endotracheal intubation who were selected by non-probability sampling in bronchoscopy unit of Masih Daneshvari Hospital.First,for each patient,a diagnostic flexible bronchoscopy was performed to identify the type,location,and severity of the stenosis.Then, under general anesthesia,patients underwent rigid bronchoscopy.After that,the stenosis was removed as possible by APC device.After two weeks,a pulmonary function test (PFT)was done to check the obstructive signs.
Results: Of all 34 patients,24 were asymptomatic for more than 1 year and responded to treatment (70/6%),5 were asymptomatic for more than 10 months and less than 12 months (14/7%)and 5 did not have asymptomatic period more than 10 months,and did not respond to treatment.In follow-up PFT,FEV1 in all patients who were asymptomatic for more than 10 months (29 patients) showed a significant progress.(At the end of the period,FEV1 was more than 90% in 27 patients and 70-90% in 2 patients.)
Conclusion: On the whole, although the surgical treatment remains the main treatment of tracheal stenosis after intubation,if this method is not possible for any reason,APC is useful as a safe and effective method.

P670
Endoscopic approach in the treatment of carcinoid tumors
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Aim: Carcinoid tumors were the neuroendocrine tumors of the tracheobronchial tree. Treatment approaches with interventional bronchoscopic methods in carcinoid tumors have been analyzed and discussed.
Method: In this study, 20 consecutive carcinoid tumor patient treated in between January 2006 to August 2011 in our Interventional Pulmonology Unit were evaluated. All patients undergone rigid bronchoscopy. In all of the patients after coagulation with diode laser or APC tumor tissue was totaly removed with core-out method. Tumors diagnosed as TC after pathological evaluation cryotherapy and/or laser was applied as a complementary procedure. Long follow up and treatment efficacy, recurrence and residive ratios, complications, mortality and morbidity were evaluated.
Results: From the 20 cases included into the study, 17 of them were TC and 3 of them were AC. Mean age of the cases were 56 (between 20-73) and 14 of them were female. Six cases, two of them were AC, were operated after bronchoscopic treatment. Rigid bronchsocopy was applied as a mean of 2.3 (1-5) times while fiberoptic bronchsocpy was applied as a mean of 3.2 times. Radial probe EBUS and otofluorescent broncoscopy were used in bronchoscopic follow up. No mortality due to bronchoscopic treatment was observed.
Conclusion: Bronchoscopic treatment is effective and safe in endobronchial carcinoid cases in which tumor base could be totally visualized bronchoscopically and pathological evaluation revealed diagnosis of TC. Efficacy could be reached by the meticulous application of the standard bronchoscopic procedure. Close follow up and treatment of recurrences is essential in the early period.

P671
Bronchoscopic treatment of benign tumors of the tracheobronchial tree
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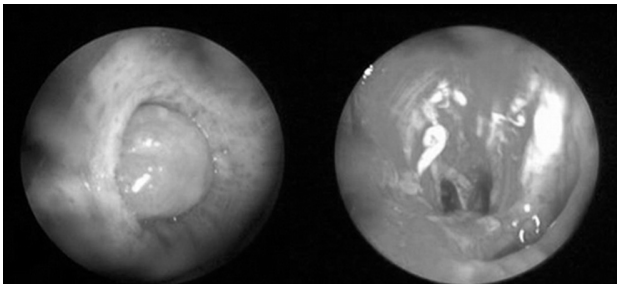
Aim: To evaluate the efficacy of the bronchoscopic treatment approach and follow up results of the treatment of the benign tumors of the tracheobronchial tree.
Method: In this retrospective cross sectional cohort study, 44 consecutive patient treated in between January 2006 to June 2011 in our Interventional Pulmonology Unit were evaluated. All patients undergone rigid bronchoscopy under general anestesia. In all of the patients firstly mechanical debridement after coagulation was applied and cryotherapy to the base of the tumor for excluding residue were applied.



Recurrence and residue ratios, early and late complications were evaluated.
Results: Most commonly treated benign tumor was hamartoma (38%, n=17). Other than this, procedures were applied to other rare tumors like as adenoma, amyloidosis, etc. In eight of the patients, tumor was located at the trachea. One to six sequence of procedure were applied to cases (mean two). No major complication was observed due to the procedures. Mortality was not observed. Surgical resection was needed in two of the cases.
Conclusion: Interventional bronchoscopic approach is safe and effective in the treatment of benign tumors of the trachea. Complete cure can be optained in all of the benign tumors in which the tumor base was seen and not advanced beyond cartilage layers.

P672
The feasibility of using a prospective multi-institutional database to measure outcomes from advanced bronchoscopy
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Background: In France, there is no prospective registry to document activity and outcomes of the new diagnostic and therapeutic bronchoscopic technologies. We assessed the feasibility of a prospective multi-institutional outcomes database of advanced bronchoscopy.
Methods: Over a 2-month period, we have interroged the procedure of advanced diagnostic (EBUS, EBUS-Mini-Probe, Autofluorence) and therapeutic bronchoscopy from 5 French institutions. Information on procedure type and lesion characteristics as well as complications were documented.
Results: A total of 943 procedures were performed, of which advanced bronchoscopy represented 25%. The most related complication remains haemorrhage after biopsies, and completed technologies Autofluorence followed by therapeutic bronchoscopy procedures. The EBUS specific complication was 3.2% in the University Hospitals, compared with a complication rate at 1.85% in the literature. The EBUS-Mini-Probe and Autofluorence global complication rate was 6.66% and 11.3% respectively. The therapeutic bronchoscopy complication rate was 7.5% in the University Hospitals, which compared favourably with the reported global complication rate of 7%.
Conclusions: Our reported complication rates are lower than in other similar studies. We believe that a registry can potentially be utilised for database collection, bench marking and quality improvement initiatives and for training purposes in the French fellowship programs. This paper-based prospective data analysis is feasible and valuable. We plan to extend this database to other French centres and in time to develop a web-based system, which will minimise the missing data fields.

P673
Interventional bronchoscopic treatment improves quality of life in patients with advanced bronchial cancer
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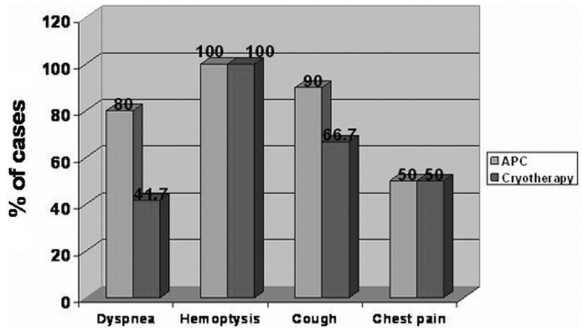
Objective: Improvement of quality of life (QOL) is a main issue in patients with

advanced bronchial cancer. Hemoptysis, dyspnea and irritating cough resulting from endobronchial obstruction are the main cause of QOL disturbance in those patients and interventional bronchoscopic treatment may play a role in solving this problem.
Methods: Patients with different symptoms related to endobronchial obstruction due to lung cancer were recruited into two groups. The first group was treated with argon plasma coagulation (APC) and the second group was treated with cryotherapy. All methods were applied via the fiberoptic bronchoscope under local anesthesia. The impact of bronchoscopic treatment on improvement of symptoms, arterial blood gases parameters, pulmonary function tests parameters, QOL and performance scale were evaluated.
Results: Forty five patients were recruited in the study. Twenty five patients were treated with APC and twenty patients were treated with cryotherapy. Bronchoscopic treatment was able to improve symptoms, pulmonary function test and blood gases parameters with subsequent improvement in the performance state of the treated patients.



Conclusions: Bronchoscopic treatment is an effective treatment to deal with symptoms related to endobronchial obstruction with subsequent improvement in the pulmonary function, blood gases, as well as QOL in these patients.

P674
Accurate monitoring of pulmonary air leak closure during endobronchial valve placement
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Introduction: Endobronchial valves may be effective for the treatment of a prolonged pulmonary air leak (PAL). A traditional chest drainage system relying on a subjective and instantaneous assessment of expiratory bubble formation in the water-seal column lacks accuracy to aid assessments during and after valve placement.
Patients and methods: Three patients with a postoperative PAL measuring at least 1000 ml air leakage per minute (ml/min) were evaluated. We attempted air leak closure using endobronchial valves relying on a digital air leak measurement system displaying and recording the expiratory pulmonary air leak in ml/min. The number of valves used was set by either leak cessation or residual leak of <100 ml/min.
Results: In all patients, the effect of every single valve placed was accurately assessed in ml/min during the procedure. In 1 patient the air leak stopped after lobar exclusion, while in 2 patients the air leak decreased to <100 ml/min after lobar exclusion. The continuous post-intervention assessment accurately indicated air leak cessation in these two patients within 48 hours after valve placement. Chest drain removal was successful after air leak cessation. None of the patients developed respiratory insufficiency requiring subacute endobronchial valve removal. As planned, all valves were removed 3-4 weeks after their placement.
Conclusion: Digital objective air leak assessment guides endobronchial valve placement, indicates the exact timing of air leak cassation, and allows a safe fast-tracking policy of chest tube removal.

P675
Endoscopic bronchial occlusion with Watanabe silicone prosthesis and biological glue for the treatment of alveolopleural fistulas
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Introduction: Alveolopleural fistula (APF) is the communication of the distal bronchial tree and pleural space, and supposes a serious problem for its associated morbi-mortality. The objective is to evaluate a endoscopic bronchial occlusion with a silicone prosthesis (Watanabe spigots) and biological glue.
Patients and methods: Observational, retrospective, descriptive study, collecting bronchial occlusion cases in our hospital from 2004 to 2010. General data collected, including details of previous and current illnesses, pleural drainage, fiberbronchoscopy, location of dependent bronchus, spigots implanted, glue instilled, recurrences, pleurodesis and monitoring.
Results: 6 patients and 7 sessions of bronchial occlusion. Average age 60, 3F/3M. The predisposing diseases were neoplasia, pneumonia and lung abscess. Debuting as empyema or pneumothorax, with a drain placed 23 days on average prior to the occlusion. Performed under general anaesthesia, the responsible bronchus located with balloon catheter, ventilator volumes, dye or sight of bubbling. Two spigots placed per session on 3 occasions, and 1 in 4 others, in sizes M and S. N-butyl cyanoacrylate was instilled in 4 sessions. The leak stopped in the operating theatre in all cases, with late recurrence in 3. No complications except expectoration of 2 spigots. Definitive lung re-expansion in 4 patients, with subsequent pleurodesis and drain removal. Two patients died from the progression of their underlying disease.
Conclusions: Endoscopic bronchial occlusion with Watanabe spigots and N-butylcyanoacrylate is an effective, technically simple method without complications for the treatment of APF.

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Temporary endobronchial embolization with silicone spigots for moderate hemoptysis: A retrospective study
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Background: Management of airway bleeding is generally performed in emergency in order to prevent hypoxemia and lung flooding. When the bleeding arises from peripheral lesions, bronchoscopic options have limited curative intents. They generally precede radiological or surgical managements. Endobronchial embolization using silicone spigots (EESS) is a novel approach.
Methods: We retrospectively reviewed charts of patients referred to our center for moderate hemoptysis (MH) who underwent EESS since 2008. Successful management is defined as immediate bleeding cessation.
Results: From December 2008 to January 2012, 9 patients (pts) have been treated with EESS in our endoscopy unit. The etiology of MH was known for 6 cases (4 lung cancers, 1 bronchiectasis, and 1 anticoagulant overdose) and 3 were unknown. The MH originated from the left upper lobe in 4 cases, the right upper lobe in 3 cases, the right middle lobe and the left lower lobe in one case each. 13 spigots were inserted. Success rate was 78%. Of the 9 pts, 6 were then referred to interventional radiology for bronchial artery embolization, with a success rate of 83% and two were referred for thoracic surgery. One patient had EESS as definitive treatment. For the remaining 8, the silicone spigots were bronchoscopically removed after a median of 4 days. Only 2 pts had hemoptysis recurrence after a median follow-up of 107 days [13-1017]. None of the patients died from hemoptysis. There were no complications from EESS.
Conclusion: EESS is an original, temporary technique that only requires a flexible bronchoscope and biopsy forceps for placement and removal. EESS allows airway protection while waiting for definitive management.

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Unilateral complete endoscopic lung volume reduction with intrabronchial valves (IBV) in severe emphysema – A retrospective analysis
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Background: In severe emphysema intrabronchial valves (IBV) for endoscopic lung volume reduction (ELVR) can improve patients symptoms, wellbeing and pulmonary function testing (PFT). Success of the intervention is thought to be correlated to the degree of volume reduction achieved through total lobar occlusion.
Objectives: To establish if unilateral ELVR with IBV (Olympus, Japan) is effective and safe in daily routine.
Methods: All patients who received unilateral complete closure of one lobe with IBV at the Thoraxklinik, University of Heidelberg in 2009/10 were included. Decision for ELVR was made without fissure analysis or endoscopic assessment of collateral ventilation. Patients were analyzed retrospectively. Regarding to the FDA criteria of response for PFT, 6-minute-walk-distance (6MWD) as well as in dyspnea score (mMRC) were analyzed. Secondary endpoint was safety.
Results: Data of 40 of 51 patients were available and consistent for retrospective analysis. An clinically relevant improvement in FEV1 after 90 days was seen in 17 (43%), in residual volume (RV) in 15 (38%), in 6MWD in 25 (63%) as well as in mMRC in 19 patients (48%). Placement with IBV was safe. Mild hemoptysis was seen in 2 cases and 3 patients developed a postinterventional pneumothorax. No mortality was observed at day 90. 180-days data will be presented.
Conclusion: Unilateral ELVR with IBV is effective and safe. Total occlusion of one lobe can improve pulmonary function as well as 6MWD and symptoms. The data should be confirmed in a prospective trial, but properly evaluation of collateral ventilation should be included for a better outcome.

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Early improvements of Chartis assisted-endoscopic lung volume reduction treatments

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Endobronchial valve (EBV) treatment improves lung function and exercise tolerance in patients with pulmonary hyperinflation related to advanced emphysema. However, collateral ventilation (CV) may strongly limit the efficacy of EBV placement. This is a preliminary assessment of the role of lung volume reduction coil (LVR-C) as a possible alternative to EBV when CV occurs.

The occurrence of CV in the targeted lobes was assessed in 7 male subjects with heterogeneous emphysema by using the Chartis system. Based upon the above system, five subjects (aged 68±12 yrs) were assigned to EBV treatment (Zephyr EBV, 3 to 4 per patient), while two patients (aged 62±4 yrs), in which CV was documented, were assigned to LVR-C treatment under fluoroscopic guidance (Nitinol coils, a total of 10 coils per patient). FEV1% pred. was 40±10% in the EBV group and 27±15% in the LVR-C group; RV% pred was 154±28% and 171±29%; respectively.

At 30 days, FEV1% pred. improved by 4.8 percentage points in the percent of the predicted value in the EBV group and by 1.5 in the LVR-C group. However, the reduction in RV% pred. was more impressive in the LVR-C group (mean difference: -50 points) than in the EBV group (mean difference: -36 points). Similarly, the improvement in the 6 min. walking distance was higher in the LVR-C group (mean difference: +47 meters) than in the EBV group (mean difference: +17 meters). All procedures were well tolerated and no major adverse effects were recorded in both groups. In our preliminary observations, LVR-coil treatment resulted in early improvements in lung function and exercise capacity, and can be proposed for the treatment of patients with severe heterogeneous emphysema when CV is documented.

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Assessment of fissure integrity for decision-making in valve treatment of emphysema: Preliminary results

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Objective: To investigate if fissure integrity can determine collateral ventilation and guide endobronchial valve (EBV) treatment of emphysema.

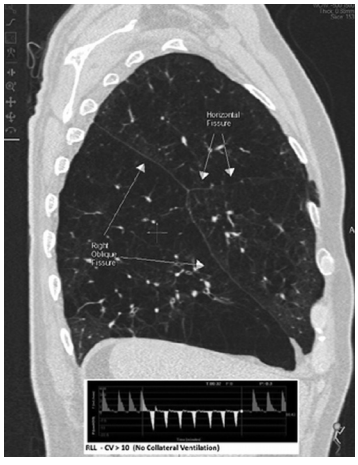
Method: The study is underway. We employ the Apollo software (VIDA Diagnostics) for treatment planning, and developed a visual fissure integrity score using a sagittal view through pre-treatment CT scans, to determine which % of the fissure was visible: <70% (incomplete); 70-90% (partial); >90% (complete). Before treatment, collateral ventilation is measured with Chartis (Pulmonx Inc., a balloon catheter inserted into the airway + console showing airflow, pressure, and resistance).

Preliminary results:

Two cases showing correlation between fissure integrity and collateral ventilation

	1	2
Sex	M	M
Age	65	77
Basal FVC	1.69 (37.5%)	1.85 (71%)
Basal FEV1	0.64 (18,5%)	0.79 (39%)
Treatment date	11 Jan 12	2 Feb 12
Heterogeneity gradient*	9.6 (homogeneous)	23.5 (heterogeneous)
Integrity score (right oblique fissure)	100%	36%
Collateral ventilation	No	Yes
Strategy	RLL exclusion	RUL exclusion + adjacent segment

*Difference between lobes in % area with parenchymal density < -950HU.



Case 1 was successfully treated based on fissure completeness.

Case 2 received an additional valve in a neighboring segment after detection of collateral ventilation.

Conclusion: Fissure integrity could be a reliable indicator of collateral ventilation and support EBV treatment of homogeneous emphysema.