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Endoscopic narrow-band imaging-quantitative assessment of airway vascularity of sarcoidosis

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Introduction or background: Various changes of subepithelial vessels of the bronchial mucosa occur in some respiratory diseases. NBI is a new technology that improves the image contrast of the surface structure by adjusting the spectrum feature regarding the wavelength dependency of the light penetration depth into the tissue and the hemoglobin absorption. We have observed in sarcoidosis patients of subepithelial vessels using a narrow-band imaging of bronchofiberscope.

Aims and objectives: It was our aim to investigate the ability of narrow-band imaging in combination with computerized image analysis to quantitatively assess airway vascularity in sarcoidosis patients.

Methods: In consecutive sarcoidosis patients, the routine procedures, optical analysis of the main carina and the upper lobe carina were performed. From every site, five representative pictures were chosen.

Results: A total of 16 sarcoidosis patients were analyzed. Increased numbers of vessels were found and these vessels were also observed in areas of cartilage. Angiogenesis or mucosal thickening was observed.

Conclusion: High magnification view with NBI revealed a clear fine subepithelial microvessel network that could be seen hardly with the ordinary filter. This combination seemed to be useful for study of the relationship of subepithelial vessels and pathogenesis of sarcoidosis.

P3571

In vivo visualization of endobronchial tumor cells using an endocytoscopy system

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Background: Endocytoscopy system (prototype, BF-Y0005, Olympus Medical Systems Co., Tokyo, Japan) is a bronchovideoscope visualizing at a high magnification of 450 times on a 14-inch video monitor. Cellular structures can be visualized in real-time during bronchoscopy.

Objectives: To evaluate the diagnostic utility of endocytoscopy on endobronchial tumors.

Methods: Between July 2009 and April 2011, 19 cases with endobronchial tumor lesions were selected from all cases of bronchoscopy. Twelve cases with no abnormality on bronchoscopy were selected as control. After conventional bronchoscopy, abnormal areas of interest were strained with 0.25% methylene

blue and examined with endobronchoscopy system. The endoscopy images of abnormal areas and normal bronchial mucosa were analyzed and compared with the corresponding pathologic pattern.

Results: We could visualize endobronchial epithelial cells with methylene blue staining. In tumor cells, especially, squamous cell carcinoma, large and polymorphic tumor cells were observed with increased cellular density. In normal bronchial mucosa, columnar epithelial cells were visualized.

Conclusion: Endocytoscopy has the potential to provide pathologic diagnosis during bronchoscopy.

P3572

Follow-up using fluorescence bronchoscopy for the patients with photodynamic therapy treated early lung cancer

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Purpose: To evaluate the accuracy of fluorescence bronchoscopy by precise histological analysis of the photodynamic therapy (PDT) treated lesions.

Methods: A retrospective study was conducted on thirteen patients (16 lesions) with centrally located early lung cancer (CLELC) had been undergone photodynamic therapy and had been followed up by fluorescence bronchoscopy. Fluorescence bronchoscopy was performed between 1 and 60 months after photodynamic therapy.

Results: Of the 16 early carcinomas treated, 14 (87.5%) had a CR, 2 (12.5%) had a NR after initial PDT. Among the 14 carcinomas achieving a CR, 4 (29%) recurred locally from 6 to 12 months after initial PDT. A total of 62 surveillance auto fluorescence bronchoscopies (average; 4.5/patient) and 47 biopsies (average; 4/patient) were performed after PDT. The addition of the SAFE - 3000 examination to conventional bronchoscopy increased the sensitivity of screening from 69% to 100%, which yielded a relative sensitivity of 145% with a negative predictive value of 100%.

Out of 14 CR lesions, 9 lesions finally reverted to normal fluorescence. CR cases that did not show normal fluorescence were relapsed cases or a patient with complete response whose treated lesion showed fibrosis in the sub mucosa. Histopathological finding of the complete response sites which demonstrated temporal fluorescent defect consisted of inflammatory lesions, goblet cell hyperplasia, basal cell hyperplasia, squamous metaplasia or dysplasia.

Conclusion: Our results confirm that SAFE - 3000 allows accurate assessment of the quality and efficacy of PDT.

P3573

Relation between vascular patterns visualized by narrow band imaging (NBI) videobronchoscopy and histological type of lung cancer

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Introduction: Narrow Band Imaging (NBI) videobronchoscopy is a new technique for visualization of bronchial mucosa. It has shown to be efficient in lung cancer detection. The primary aim of this study was to evaluate relation between vascular patterns visualized by NBI as described by Shibuya and histology of lung cancer.

Patients and methods: The study included 65 patients with suspected lung cancer scheduled for bronchoscopy. After identification of endoscopically visible tumor NBI was used to determine predominant type of pathological vascular pattern (dotted, tortuous, abrupt-ending blood vessels – Shibuya descriptors). Pearson's chi-square test was used to test statistical significance between vascular pattern and histological type of cancer.

Results: Lung cancer was confirmed in all patients; 63.1% was diagnosed with squamous cell lung cancer (SCC), 24.6% had adenocarcinoma, 9.2% had small cell (SCLC) and 3.1% large cell lung cancer (LC). Dotted blood vessels were significantly ($p < 0.000$) associated with adenocarcinoma, identified in 68.4% adenocarcinoma and 31.6% SCC. Tortuous blood vessels were identified in 72% SCC, 8% adenocarcinoma, 12% SCLC and 8% of LC. Tortuous blood vessels were significantly ($p < 0.000$) associated with SCC. Abrupt ending vessels were identified in 81% SCC, 14.3% SCLC and 4.8% adenocarcinoma, this type of blood vessels was also significantly associated ($p < 0.000$) with SCC.

Conclusions: Dotted visual pattern of blood vessels identified during NBI videobronchoscopy is highly suggesting adenocarcinoma histology of lung cancer, while tortuous and abrupt ending blood vessels significantly suggest squamous cell histology of lung cancer.

P3574

Safety profile, efficacy and patient comfort with propofol sedation in outpatient fiberoptic bronchoscopy

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Introduction: Procedural sedation is suggested in outpatient bronchoscopy to

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improve tolerance & patient satisfaction. Propofol, a short acting intravenous hypnotic, offers advantages over benzodiazepines/opiates.

Objectives: We analyzed the feasibility, efficacy & safety profile of propofol administered by a trained nurse for outpatient bronchoscopy.

Methods: A total of 276 flexible bronchoscopies performed between 2009 & 2011 using propofol sedation only without premedication were retrospectively reviewed. Patient demographics, indications, type of procedure, procedure time, medication doses, comfort level on 10cm verbal analogue scale (VAS, 0-10, 0=excellent, 10=unbearable) & adverse events were analyzed from procedure records.

Results: Of the 276, two-thirds (182, 66%) patients were male with an average age of 56 years (range 18–82) & an average weight of 73 kg. Indications included diagnostic BAL (127, 46%), TBLB (68,25%), TBNA (41,15%) & EBB (22,8%). Average procedure time was 36 minutes (range 12–145). Average propofol dose was 1.86 mg.kg⁻¹ (range 0.12–20 mg.kg⁻¹). Minor adverse events (21, 7.6%) included hypotension (19, 7%), transient hypoxia (8, 3%) & tachycardia (5, 2%). Major adverse events (death,intubation, ICU stay, or hospitalization) occurred in 7 (2.5%), of which 3 (1%) were attributed to sedation, 2 (0.7%) to hemoptysis, & 1 each to hypoxia & bronchospasm. There were no procedure-related deaths. A majority (196, 71%) reported VAS of 4-6 with good amnesia, while 56 (20%) had VAS > 6 & 24 (8.6%) had VAS <3.

Conclusions: Propofol is an easy to administer, safe, & effective procedural sedative for outpatient bronchoscopies providing acceptable comfort.

P3575

Lidocaine administration to the laryngopharynx for inducing anesthesia before bronchoscopy: A comparative study of Jackson's spray method and ultrasonic nebulization

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Objective: To compare the degrees of pain experienced by patients and additional intraoperative amounts of lidocaine required when lidocaine is administered using Jackson's spray and an ultrasonic nebulization.

Methods: Forty patients who were given laryngopharyngeal anesthesia before bronchoscopy were divided into 2 groups of 20 patients each: group A, which was given 4% lidocaine 5 mL by using Jackson's spray, and group B, which was given 2% lidocaine 10 mL by using an ultrasonic nebulizer. The degrees of pain in patients evaluated on the basis of examination times, amounts of lidocaine administered during bronchoscopy, rates of lidocaine use (obtained by dividing amounts of lidocaine administered during bronchoscopy by examination times), and results of a questionnaire survey consisting of a 5-point evaluation scale for 7 items were compared between the 2 groups.

Results: There were no significant differences in examination times, amounts of lidocaine administered during bronchoscopy, and degrees of pain between the groups. However, the rates of lidocaine use in group B were significantly lower than those in group A (0.55±0.3 mL/min versus 0.38±0.2 mL/min; p = 0.03). An analysis based on patient age and smoking history showed that the rate of lidocaine use in group A was not significantly high in elderly persons (less than 70 years of age) and smokers (p = 0.05).

Conclusion: In laryngopharyngeal anesthesia before bronchoscopy, the Jackson spray required a large amount of lidocaine at the time of bronchoscopic examination for bronchoscopy time, compared with the ultrasonic nebulizer.

P3576

Incremental midazolam versus midazolam/rentanyl sedation during flexible bronchoscopy. Safety and tolerance in relation to the complexity of intervention

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Background: Sedation during flexible bronchoscopy (FB) is undisputed. Although suggested, benzodiazepines and opiates combination is underused due to fear of complications.

Aim: To prospectively compare safety and tolerance of FB sedation using incremental midazolam (M) versus combined midazolam/fentanyl (MF) administration.

Methods: Consecutive patients referred for FB were enrolled. After administration of 2% lidocaine aerosol, sedation with midazolam (1-5 mg) alone or combined with fentanyl (0.025-.005mg) was given. Decision relied on clinical parameters (fear,anxiety,cough and restlessness) and on staff judgment regarding performed interventions.Nurses took active role estimating sedation need. Patients completed verbal analogue scales (VAS) and overall tolerance questionnaires.Bronchoscopists completed tolerance VAS and complications questionnaires.

Results: 68 patients (53 males, aged 65±12) enrolled.31 received only M (mean 2.23 mg) while 37 received combined sedation (mean 2.74mg M and 0.033 mg F).No sedation related complications were reported.Increased duration of FB and

interventional procedures (EBUS, TBNA, Electro-Cryotherapy) were associated with combined MF sedation and increased M dosage (p < 0.05). Patients & bronchoscopists reached high VAS scores (>8/10).Discomfort and adverse effect scores were equally minimal.

Conclusion: Both regimens are safe and effective in reducing anxiety and cough while increasing FB tolerance. Selection can be based on prolonged duration and need for interventional modalities. Trained endoscopy nurses are effective in incrementing sedation during bronchoscopy in an "as needed" basis.

P3577

Propofol sedation for flexible bronchoscopy: A large randomized, controlled, non-inferiority trial

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Background: Propofol is a feasible and safe method for sedation in patients undergoing flexible bronchoscopy. However, there are no data comparing bolus administration versus continuous infusion of propofol for flexible bronchoscopy.

Methods: 702 consecutive patients undergoing flexible bronchoscopy were randomly allocated to receive intravenous propofol using either a continuous infusion or an intermittent bolus technique. The primary endpoint was the number of any adverse event (SaO₂ ≤ 90%; need for oro- or nasopharyngeal airway insertion; systolic BP < 90 mmHg, minor or major bleeding, pneumothorax, need to abort bronchoscopy, ICU, intubation or death) assessed by the end of FB and at 24 hours.

Results: The number of any adverse event was similar in both randomized groups (Bolus group 219 vs. 211 Infusion group, p = 0.810). There were complications in 8 (1.1%) cases (6 major bleedings, 2 intubations). There was no death. As compared to the Bolus group, the amount of propofol required was significantly higher in the infusion group (226mg ± 147 versus vs. 308 mg ± 204.8, p < 0.0001). In a linear multivariate regression model, this difference remained significant independently of duration and the interventions (e.g. TBB, EBUS) performed during flexible bronchoscopy. The duration of bronchoscopy was significantly longer in the infusion group (14 [9 - 24] versus 17 [12 - 27] minutes, p < 0.0001).

Conclusion: Although propofol continuous infusion is as feasible and safe as bolus administration, it is associated with higher propofol requirements and a longer duration of the bronchoscopy.

P3578

Bronchology in the Czech Republic – National surveys during last decades

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Czech bronchology has a long tradition and its activities have been monitored for many years. Statistical analysis based on questionnaires was realised in 1977 (Hlobil), 1994 (Marel), 1996, 1999,2003 (Kolek). Increasing trends of total numbers of endoscopes, bronchoscopies and especially interventional bronchological procedures were verified in this surveys. Similar questionnaire was sent electronically and via post to all Czech bronchological centres in 2009. Personal and telephone contacts were used to accelerate an adequate response,too. Questions dealt with numbers of bronchoscopists, types of bronchoscopes, diagnostic methods, interventional techniques and system of work. Results were compared with older surveys mentioned above.

In 2009 there were 59 active bronchological centres, which performed 33. 282 bronchoscopies. Out of them 1.637 (4.9%) were done by rigid bronchoscope, 258 were done in children. General anaesthesia was used in 2194, fluoroscopy in 1238 procedures. Altogether 182 bronchoscopists worked with 182 flexible and 87 rigid bronchoscopes, 29 videocameras and 81 videobronchoscopes. Out of all procedures, 544 EBUS, 1724 AFO,1041 NBI and 46 EMN investigations were performed. Doctors performed 1235 laser resections, 246 electrocauteries, 121 stent insertions, 78 afterloadings, 5 plasmacoagulations, 3 cryotherapies and first endobronchial valves insertions.

During last decades, the quantity of bronchological procedures (especially therapeutic and new sophisticated diagnostic methods) is increasing, vice versa the number of bronchological centres is decreasing.

P3579

Bronchoscopic practice in Japan

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Background and objective: To investigate the current state of mechanisms to ensure the safety of bronchoscopic practice, the Japan Society for Respiratory Endoscopy conducted a national survey.

Methods: A questionnaire survey was conducted over the course of 1 year (2010). A questionnaire was mailed to 538 facilities authorized by the Society.

Results: Responses were obtained from 511 facilities (95.0%). Rigid bronchoscopes were used in only 18.5% of the facilities, while mobile/thin bronchoscopes

were used in $\geq 50\%$, and fluoroscopy systems were used in 99.8%. Biopsies were performed after discontinuation of therapy in patients receiving antiplatelet drugs and anticoagulants in 96.7% and 97.4% of the facilities, respectively. Atropine was administered for premedication in 67.5% of the facilities, a decrease from previous surveys. Intravenous sedation was given in 36.1% of the facilities. In 21.9% of these, the procedure was conducted in the outpatient clinic for $\geq 70\%$ of patients. A bronchoscope was orally inserted in $\geq 70\%$ of patients in 95.7% of the facilities. Intravenous access was maintained during the examination in 92.5% of the facilities, oxygen saturation was monitored during examinations in 99.0%, oxygen was administered in 97.6%, and resuscitation equipment was available in 96%. In 98.6% of the facilities, bronchoscopes were disinfected using an automatic washing machine, but glutaraldehyde was used in 42.2%.

Conclusions: Japan-specific characteristics in bronchoscopic practice were identified. Whether procedures used in Japan meet international guidelines with respect to safety should be monitored continuously. In addition, a Japanese evidence-based consensus is needed.

P3580

The ratio of HBsAg, anti-HCV and anti-HIV positivity in patients indicated for fiberoptic bronchoscopy before the procedure

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Introduction: Performing fiberoptic bronchoscopy has many risks for the bronchoscopy personnel. May be the most important risk is the transmission of tuberculosis bacilli from the patient to the bronchoscopy personnel. In addition, transmission of blood-borne viruses such as hepatitis B, HCV and HIV might be the other important risk for the bronchoscopy personnel particularly for the bronchoscopist. Splash of bronchial secretions to conjunctiva might be considered as the main route of transmission. Non-intact skin exposure might be the second route.

Aim: The aim this study was to investigate the ratio of the patients having positive results for blood-borne viruses undergoing bronchoscopy before the procedure.

Method: We retrospectively screened the medical files/records of the patients undergoing bronchoscopy procedure between May 2011 and January 2012.

Results: There were 183 patients with a bronchoscopy indication. Mean age was 35 \pm 17. 123 patients had HBsAg, anti-HCV and anti-HIV test results. HBsAg was positive in five patients (4%). Anti-HCV and anti-HIV test results of all the patients were negative.

Discussion: In our country, different results for HBsAg positivity, between 2%-10%, were reported in different studies. Our results are similar the results of these studies. A ratio of 4% HBsAg positivity should not be seen as a small ratio. Absence of anti-HCV and anti-HIV positivity might be attributed to the small number of study group.

Conclusion: This study suggests that bronchoscopy personnel are under the risk of hepatitis B transmission. Large studies are needed to indicate the transmission risk of blood-born viruses for the bronchoscopy personnel.

P3581

Verucous carcinoma of the tracheobronchial tree – An underdiagnosed entity?

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Verucous carcinomas are described as rare squamous cell carcinomas of the oropharynx, larynx and esophagus but surprisingly not in the tracheobronchial tree.

We describe the case of a 74 years old man admitted to our hospital for increasing shortness of breath and the diagnosis of COPD exacerbation. As patient didn't improve despite antiobstructive treatment bronchoscopy was performed and showed a warty polypoid circumferential mass in the distal trachea reducing the cross sectional area by $\sim 70\%$.

Histologic work up showed a highly differentiated squamous cell carcinoma with low proliferation index and only mild nuclear atypia but substantial aneuploidia in DNA cytometry. Positive in-situ hybridisation against HPV 1,6,7,16,18,31 probe eluded HPV infection.

Further staging including FDG-PET CT didn't show any evidence for local or distant metastases. LASER bronchoscopy and kryoablation was performed for removal of the remaining tumor. Interestingly lung function test after recanalisation was completely normal.

In repeated bronchoscopy controls no evidence for recurrence could be seen for 9 months now.

Endoscopically as well as histologically this tumor resembles verucous squamous cell carcinomas found in the gastrointestinal tract. Aneuploidia in DNA cytometry proved the malignant character of the disease. So we classified it as verucous carcinoma of the trachea though never described before and argue that papillomatous tumours of the tracheobronchial tree may be misdiagnosed as papillomas instead of verucous carcinomas. The long history of airflow limitation and the actual diagnosis of malignant disease seems to be a sign of late malignant transformation as previously described in papillomas.

P3582

Hemangiopericytoma – An extremely rare bronchial tumour, a difficult diagnosis

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Background: Hemangiopericytoma is a rare mesenchymal tumor originating from the capillary pericytes (about 1% of vascular tumors). Its primary localization in the lung is extremely rare.

Case presentation: A 52-year old man, smoker(60PY), is diagnosed two months ago-by bronchoscopy and chest CT scan-with the main left bronchus tumor with subsequent negative biopsies. He was admitted to our hospital for reconsideration and clarification endoscopic diagnosis. "Enecefaloidal" endoscopic tumor that stenosis left main bronchus from the beginning by 65%, but without bronchial wall infiltration around the tumor.

1. We performed rigid bronchoscopy and "Jet" ventilation with snare electroresection of tumor in three stages.

Histopathological examination of a biopsy specimens - non-small carcinoma.

After bronchoscopy intervention, persist only distal total obstruction of left main bronchus.

2. Radical left pneumonectomy with mediastinal lymphadenectomy and intrapericardial approach of vessels is involved.

Macroscopically: White multinodular tumor, 14/10/10cm size, with large foci of necrosis. *Microscopically:* Malignant hemangiopericytoma.

Discussion: Diagnosis of hemangiopericytoma was established after left pneumonectomy. Postoperative chemotherapy that combined carboplatin and taxol were performed.

Conclusion: Hemangiopericytoma is a rare vascular slow-growing tumor with high local recurrence and poor prognosis because the recurrence of disease. Preoperative diagnosis is difficult. Surgical radical excision is the treatment of choice, although the criteria for determining the area of resection have not been established.

P3583

Pulmonary-alveolar microlithiasis (PAM) as a rare differential diagnosis of diffuse lung diseases diagnosed by transbronchial cryobiopsy

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Introduction: PAM is a rare pulmonary disease of unknown origin. Microscopically, it is characterized by diffuse alveolar calcification. Chest x-ray usually presents a "sandstorm" image. Diffuse lung diseases are typically diagnosed by computed tomographic imaging; histological validation is won by surgical lung biopsy. Current studies show a more important role of transbronchial cryobiopsy for histological diagnosis.

Case report: A 26-year-old male presented with dyspnea. The radiographic images (chest x-ray, computed tomography) showed interstitial pulmonary changes without PAM-typical signs. Blood gas analysis, blood test results and pulmonary function did not show abnormalities. For further evaluation we performed bronchoscopy with transbronchial cryo- and forcepsbiopsy.

Methods: Cryoprobe and forceps were introduced into the left lower lobe under radiological guidance; the cryoprobe was cooled for five seconds and then retracted with the frozen lung tissue. The specimen were rated by two experienced lung pathologists.

Results: Histologically the forcepsbiopsy showed only few hints for PAM, whereas in the cryobiopsy a pulmonary-alveolar microlithiasis could be proven due to big amount of alveolar tissue with concentric calcification. In respect to atypical radiographic signs this was determining.

Conclusion: There is a huge variety of diffuse lung diseases. The diagnosis of PAM was surprising because the radiographic images showed an atypical morphology. The histological diagnosis of PAM was proven by transbronchial cryobiopsy. This shows the potential impact of transbronchial cryobiopsy in different entities of interstitial lung disease.

P3584

Management of video capsule bronchial aspiration

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A 74-year old patient with of occult gastrointestinal bleeding was referred for a small bowel exploration using video capsule endoscopy. Medical history revealed

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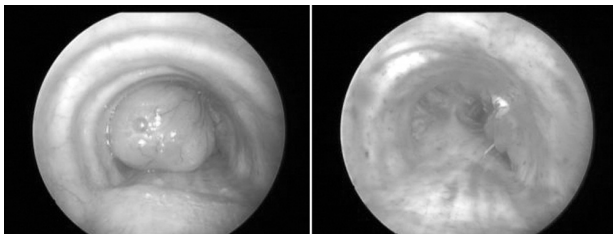
left hemiparesis and swallowing disorders as sequels of stroke. A video capsule endoscopy was scheduled after the advice of the ENT specialist. Within minutes after the capsule ingestion, the patient developed a typical choking episode. Real-time visualization of the video-endoscopic "bronchial tree" images by the gastroenterologist quickly assisted by the pulmonologist enabled locating the capsule at the level of the main carina/left main bronchus. Immediate bronchoscopy under general anesthesia allowed the pulmonologist to gently catch the video capsule and to readily place it within the gastro-intestinal tract (stomach). Small bowel exploration could then be performed "as scheduled" and revealed duodenal and jejunal angiomas as the source of the bleeding. Pictures as well as short video sequences of the choking episode and of the gastro-intestinal placement of the capsule with the bronchoscope are presented. Based on this experience and on the literature (about 9 reported cases of tracheo-bronchial video capsule aspiration) two recommendation can be made
 §caution should be taken in patients with swallowing disorders
 §immediate tracking by of the capsule initial path is recommended
 The present case also shows that a combined approach (gastroenterologist + pulmonologist) permits to replace the video capsule in the right way during the same procedure.

P3585**A case of primary tracheal B cell lymphoma leading to obstruction of central airway**

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Primary malignant tumors of the trachea are rare; and they follow up such as asthma, chronic obstructive pulmonary disease incorrect diagnoses. Tracheal tumors are rare and the incidence less than 0.01% and the majority of squamous cell carcinoma. Very few cases of primary lymphoma of the trachea have been reported so far. 72 years old male patient admitted to our clinic with complaints of shortness of breath, bronchoscopy showed a mass obstructing the tracheal lumen of the almost complete.

Diode laser and coring was performed for emergency desobstruction.



There was no another focus of the patient's systemic screening whose pathological result is B-cell lymphoma. Reported due to a rare tracheal tumor.

P3586**Foreign body aspiration by a 31 years old female patient, mimics diaphragmatic hernia**

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Introduction: We present a case of food aspiration by a 31 years old female patient, masquerading as diaphragmatic hernia.

Aims and objectives: Our aim is to show that food aspiration is a life threatening condition and it can easily escape detection.

Methods: A 31 years old female presented at the emergency department with shortness of breath. Her past history was unremarkable. The chest X-ray demonstrated total collapse of the left lung and herniation of the stomach and large intestine into the left pleural cavity. Chest CT- scan demonstrated the presence of stomach and large bowel in the left chest suggesting a posterolateral diaphragmatic hernia. The patient was subjected to an posterolateral thoracotomy. To our surprise there was only local eventration of the left hemidiaphragm. Atelectasis of the left lung persisted despite ventilation with high pressures. The patient subjected in intraoperative flexible bronchoscopy and there was presented a large quantity of mucus surrounding a soft mass adhered at the wall of the bronchus. Rigid bronchoscopy was performed the following day and a piece of meat was extracted. **Results:** Atelectasis soon disappeared and the patient had normal breath again, after the extraction of the food mass.

Conclusion: Foreign body aspiration is unusual in adults, except those who are debilitated or have neuropsychiatric disorders. The doctors must be suspicious about this condition even in young healthy patients and bronchoscopy must be used as diagnosing and therapeutic step, before the patient subject a thoracotomy.

P3587**Endoscopic resection of airway benign tumors by argon plasma coagulation**

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Benign airway tumors with central airway obstruction require immediate intervention for symptoms relief. Argon Plasma Coagulation (APC) is a cheap tool readily available in hospitals.

Four patients presented for obstructing tracheal or bronchial tumor (2008 to 2011). Initial investigations included fiberoptic bronchoscopy and CT imaging of the chest. Argon plasma was set to 35 Watt and delivered in non-contact fashion through a large fiber during rigid bronchoscopy. Initially tumor coagulation was done followed by mechanical resection and finally APC was applied to tumor base. Patients were discharged next day and followed clinically by CT imaging and bronchoscopy. All patients were reevaluated one year after ablation to eliminate recurrence.

Case1: 24 years old female presented for uncontrolled asthma. Endoscopic resection with APC revealed tracheal schwannoma.

Case2: 35 years old female, 6 month pregnant, intubated for respiratory failure due to obstructive tracheal tumor. Endoscopic resection yielded low-grade muco-epidermoid carcinoma of the trachea.

Case3: 60 years old male, smoker, with concomitant sarcomatous carcinoma of the kidney presents for dyspnea, persistent cough and obstructive lesion of the right main bronchus. Ablation by rigid bronchoscopy and APC unraveled bronchial hamartoma.

Case4: 57 years old male, smoker, presents for persistent cough. Rigid bronchoscopy and APC resection of right bronchial obstruction uncovered a hamartoma.

APC is an effective and efficient tool to use during resection of benign bronchial tumors, it's safe to use in pregnant patient and provides immediate airway relief. Shwannoma, hamartoma and low-grade muco-epidermoid tumors can be treated with this modality.

P3588**An unusual approach to manage a bronchopleural fistula following carinal pneumonectomy**

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A 52-year-old lady was referred with a T4N0M0 lung adenocarcinoma in the right main bronchus with protrusion into the trachea. She was an exsmoker with COPD and hypothyroidism.

She had a right carinal pneumonectomy with anastomosis of left main bronchus on to the trachea. Post discharge she was readmitted with dyspnoea three weeks later. Her post pneumonectomy space was abnormally enlarged which was managed successfully with intercostal tube drainage.

Six weeks later she represented with dyspnoea and sepsis which did not respond to antibiotics. She had a right thoracotomy and bronchoscopy which showed two bronchopleural fistulas (BPF) at the anastomotic site. Unfortunately the BPF persisted. Further surgery was not considered appropriate. She then had a rigid bronchoscopy and a 4cm X 16 mm covered stent deployment to cover the defects. A day later she still had an air leak. Chest X-ray four days later showed that the stent had migrated upwards. She had replacement of the stent with a larger 4cm X 18 mm device. Following day, the air leak stopped completely. Her follow up chest x-ray three months later has been stable with no recurrence of BPF.

This case illustrates the management difficulties of BPF complicating high bronchial to tracheal anastomosis with differing airway diameters. Placement of large stent could have jeopardised the integrity of the airway anastomosis. The first stent migrated because it was preferentially sized with respect to the bronchial diameter. When a larger stent was inserted adequate closure ensued without airway anastomotic dehiscence.

Although surgical treatment of BPF is gold standard carefully selected patients may benefit from endobronchial closure.

P3589**Models must be able to bleed – The real interventional bleeding simulator a new training model for interventional bronchoscopy procedures as a sufficient substitute for training on live animals**

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Introduction: Until now bleeding could be only trained on live pigs.

Background: The current available models are not able to demonstrate acute endobronchial bleedings.

Methods: We developed a new Biosimulation model for interventional bronchoscopy including a real-life-simulation of bleeding in bronchial tree. The model contains 2 transparent covers, a full expanded pig lung, an intubation head and an artificial diaphragm. We inserted "endobronchial tumors" and simulated different realistic bleeding situations with artificial blood.

Results: At an interventional training course organized by the Austrian Society of Pneumology (2010/2011) the simulator allowed the trainees different simulated bleedings. The feedback given by all the 32 trainees showed a convincing

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and realistic effect for all interventional procedures. Furthermore the possibility of managing the bleeding situation with e.g. balloon catheter, tamponade, APC Beamer and stenting could be trained.

RIB- Simulator	Training on live pigs
Repeatable massive hemorrhage (A)	One massive hemorrhage possible (D)
In every room (A)	Only in operating room (D)
Uninfectious artificial blood (A)	Blood potentially infectious (D)
Adaptable tracheal length (A)	Limited use of rigid tools (long trachea) (D)
Exchangeable lungs, pediatric model (A)	"Life atmosphere"(A) General anesthesia (D)
Low costs (A) no vet (A)	Total costs high (D)

Advantage = (A), Disadvantage (D).

Conclusions: The RIB-Simulator will restore the training on live pigs in future and will be helpful to develop algorithms for all interventional procedures especially connected to the handling of bleedings.