

TUESDAY, SEPTEMBER 27TH 2011

464. Access to the periphery: solitary periphery nodule

4522

Usefulness of endobronchial ultrasonography with a guide sheath for diagnosing ground glass opacity lesions

Yasuyuki Ikezawa¹, Naofumi Shinagawa¹, Taichi Takashina¹, Kenichiro Ito¹, Iki Ogura¹, Yutaka Takeuchi¹, Noriyuki Yamada¹, Hajime Asahina¹, Jun Sakakibara-Konishi¹, Satoshi Oizumi¹, Kosuke Nakano², Noriaki Sukoh², Masaharu Nishimura¹. ¹First Department of Medicine, Hokkaido University School of Medicine, Sapporo, Japan; ²Respiratory Department, National Hospital Organization Hokkaido Cancer Center, Sapporo, Japan

Background and purpose: It is often hard to diagnose ground glass opacity (GGO) lesions by transbronchial biopsy (TBB), because of difficulty in detecting the site of the lesions under X-ray fluoroscopy. We have reported the usefulness of TBB using endobronchial ultrasonography with a guide sheath (EBUS-GS) for small peripheral pulmonary lesions (PPLs). EBUS-GS has an advantage to detect the location of PPLs. In this study, we retrospectively analyzed the diagnostic yield of GGO lesions by EBUS-GS and examined of lesions which might influence the diagnostic yield.

Patients and methods: Between August 2003 and December 2007, we performed EBUS-GS for a total of 67 GGO lesions in Hokkaido University Hospital and Hokkaido Cancer Center.

Results: Of the 67 lesions (11 pure GGO lesions and 56 mixed GGO lesions, which consist of GGO components more than 50%), 43 (64%) were not visible by conventional X-ray fluoroscopy. Thirty-eight lesions were diagnosed by TBB with EBUS-GS (36 adenocarcinoma, 1 lymphoma and 1 inflammation). The average size of lesions with diagnosis was significantly larger than that of lesions without definitive diagnosis. (23.9mm vs. 16.7mm; $P < 0.01$) For lesions with bronchus leading directly to the center of the lesions on high-resolution computed tomography images (positive CT sign), the diagnostic yield was significantly higher than lesions with negative CT sign. (31% vs. 66%; $P < 0.01$)

Conclusion: EBUS-GS is a useful method for diagnosing GGO lesions. However, failure of diagnosis is associated with the lesions in smaller size and/or with negative CT sign.

4523

Endobronchial ultrasound-guided transbronchial biopsy with thin bronchoscopy for peripheral pulmonary lesions

Masahide Oki, Hideo Saka, Chiyo Kitagawa, Yoshihito Kogure, Shigehisa Kajikawa, Naohiko Murata, Takashi Adachi, Saori Oka, Rie Tsuboi. *Department of Respiratory Medicine, Nagoya Medical Center, Nagoya, Japan*

Introduction: Endobronchial ultrasound-guided transbronchial biopsy (EBUS-TBB) using a conventional bronchoscope has the limitation of poor bronchial selectivity because of its large size.

Aims and objectives: The purpose of this study was to evaluate the diagnostic utility of EBUS-TBB using a thin bronchoscope for peripheral pulmonary lesions.

Methods: Data prospectively collected from 188 patients with suspected peripheral lesions who underwent EBUS-TBB using a 3.4-mm thin bronchoscope with a 1.7-mm channel and a 1.4-mm radial ultrasonic probe under fluoroscopic guidance were retrospectively analyzed.

Results: Thirteen patients with endobronchial lesions within the segmental bronchi that were defined as central lesions and 6 patients who did not return to follow-up were excluded from this analysis. Thus, a total of 169 patients (113 men and 56 women; median age, 67 years) with peripheral pulmonary lesions (median size, 28 mm; range, 8 to 70 mm) were included in the final analysis. The mean bronchus level reached with the thin bronchoscope was 4.6th generations. The lesion was localized with EBUS in 151 patients (91%). Diagnostic histologic specimens were obtained in 115 of 169 patients (68%; 48% [81% for lesions >30 mm, 50% for lesions >20 to ≤30 mm, and 17% for lesions ≤20 mm] for benign lesions and 76% [85% for lesions >30 mm, 70% for lesions >20 to ≤30 mm, and 65% for lesions ≤20 mm] for malignant lesions). Five complications (3%) occurred: 3 pneumothoraces, 1 pneumonia, and 1 moderate bleeding.

Conclusion: EBUS-TBB using a thin bronchoscope is an accurate method for the diagnosis of peripheral pulmonary lesions, especially malignant lesions.

4524

Efficacy of endobronchial ultrasonography (EBUS) using a guide sheath (EBUS-GS) for transbronchial sampling of peripheral lung lesions

R. Mustafa, S. Abdellati, M. Munavar. *Respiratory Medicine, Lancashire Teaching Hospitals, Royal Preston Hospital, Preston, Lancashire, United Kingdom*

Background: Endobronchial ultrasonography with a radial scanning miniature probe provides cross-sectional images of peripheral pulmonary lesions. Ultrasound probe covered with a guide sheath is introduced via the bronchoscope and is withdrawn after localisation of the peripheral lesion. The guide sheath is left in situ to direct sampling.

Aim: To assess the diagnostic yield and safety profile of this novel technique.

Methods: Ten patients with peripheral lung lesions were selected for EBUS-GS sampling between January 2010 and June 2010. Guided sampling was later deferred in two cases with visible endobronchial disease at conventional bronchoscopy. EBUS-GS Transbronchial biopsy (TBB) and Bronchial brush (BB) specimens were obtained. With the knowledge of subsegment leading to the peripheral lesion, additional blind TBB and bronchoalveolar lavage (BAL) specimens were also acquired following removal of the GS.

Results: Mean size of the lesions sampled was 34 mm (22 to 52 mm). EBUS-GS TBB and BB specimens yielded a definite diagnosis of lung cancer in five (62.5%) patients. Three patients had no malignant cells in either EBUS-GS TBB or BB specimens. In one of these three patients, malignant cells were isolated from Blind TBB and BAL specimens which had been taken in addition to EBUS-GS samples. Hence a definite diagnosis of cancer was obtained in six (75%) patients. The procedure was well tolerated and none of the patients suffered major bleeding or pneumothorax.

Conclusion: Diagnostic yield of transbronchial sampling of peripheral lung lesions is significantly improved with the use of EBUS-GS without an increase in complication rate.

4525

Ultrasound guided transbronchial cryobiopsy in the diagnosis of peripheral lung lesions: A feasibility and safety trial

Ralf Eberhardt¹, Maren Schuhmann¹, Korkut Bostanci², Nicolas Kahn¹, Philipp A. Schnabel³, Felix J.F. Herth¹. ¹*Pneumology and Respiratory Care Medicine, Thoraxklinik at the University of Heidelberg, Heidelberg, Germany;* ²*Departemnt of Thoracic Surgery, Marmara University Istanbul, Istanbul, Turkey;* ³*Institute of Pathology, University of Heidelberg, Heidelberg, Germany*

Background: Peripheral lung lesions (PLL) can pose a diagnostic problem since they are often difficult to reach and only insufficient material can be obtained by transbronchial forceps biopsy. Endobronchial Ultrasound (EBUS) can be used for detection of PLL and in combination with a flexible cryoprobe (Erbe Medizintechnik, Germany) larger tissue samples can be taken. The purpose of this study was to evaluate the safety and feasibility of this technique.

Methods: Patients with PPL up to 4cm in diameter were enrolled prospectively. After the PLL had been identified by EBUS we performed forceps as well as cryo biopsies under fluoroscopy through a guide-sheath. The order of the techniques used was randomised. The pathologist was blinded towards the biopsy technique. We evaluated and compared the diagnostic yield and sample size as well as the complication rate.

Results: We were able to reach the lesion with EBUS guidance in 31 of 39 patients. The final diagnosis of the 31 patients was malignant in 25 and benign in 6 cases. In 74% we were able to make a definitive diagnosis with bronchoscopic sampling (23 of 31). In 19 cases the diagnosis was made with forceps as well as cryobiopsy, in 4 cases only through cryobiopsy. Samples obtained by cryobiopsy were significantly larger. Complications observed during the procedure were 1 moderate bleed after cryobiopsy treated endoscopically. No pneumothorax occurred.

Discussion: Transbronchial cryobiopsy with EBUS guidance is a safe technique and useful to obtain histological samples for diagnostic purposes. By obtaining larger tissue samples it may be possible to improve the bronchoscopic diagnostic yield for peripheral lung lesions.

4526

Safety and tolerance of transbronchial lung biopsy with cryoprobes vs conventional forceps

Laia Garcia-Bellmunt¹, Virginia Pajares¹, Alfons Torrego¹, M^a Carmen Puzo¹, M^a Angels Gil², Vicente Plaza¹. ¹*Pneumology;* ²*Anaesthesiology, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain*

Background: Bronchoscopic transbronchial biopsy (TBLB) by the use of cryoprobes has been described as a feasible procedure to obtain lung samples.

Objectives: To determine safety of TBLB with cryoprobes vs conventional forceps. To compare the procedure length and patients' tolerance with both techniques.

Patients and methods: Patients with interstitial lung diseases referred to perform a TBLB were prospectively randomized in: Group 1: cryoprobe (Erbocryo CA[®]) and Group 2: conventional forceps.

Patients in group 1, under deep sedation, were intubated to allow quick cryoprobe and bronchoscope introduction and removal. Bronchoscopies in group 2 were performed under conscious sedation. Tolerance questionnaires, number of biopsies, procedure's duration and related complications were registered.

Results:

	Cryoprobe	Forceps	P value
N	27	28	NSP
Number of biopsies	3,6±0,9	3,5±1,2	NSP
Duration (min)	30,8±6,9	32,6±9,3	NSP
Tolerance: Qualitative scale (a)	95,4	47,8	p < 0,05
Tolerance: Quantitative scale (cm) (b)	2,5±2,2	1,4±2,8	p < 0,05

Data is expressed as mean ± SD. (a) Patient's % scoring 1 (good tolerance). (b) VAS. Distance from 0 (bad tolerance).

	Cryoprobe (%)	Forceps (%)
None	3 (11,2)	5 (17,9)
Bleeding I (a)	6 (23,2)	12 (42,9)
Bleeding II (b)	16 (59,3)	10 (35,7)
Bleeding III (c)	0 (0)	0 (0)
Pneumothorax	2 (7,4)	2 (7,2)
Chest pain	1 (3,7)	1 (3,6)

(a) Mild, no specific treatment is needed; (b) moderate, controlled with standard haemostatic techniques; (c) severe, requiring extra haemostatic treatments, interrupting the procedure. NS p value.

Conclusions: No safety differences have been observed between both techniques. Better tolerance in the cryoprobe group was probably due to the anaesthetic management.

4527

Bronchoscopy of peripheral lung lesions: Cost-effectiveness analysis of different combinations of sampling techniques

Kjetil Roth^{1,2}, Tomas Mikal Eagan², Friedemann Leh³, Alf Henrik Andreassen², Jon Andrew Hardie². ¹*Dept. of Internal Medicine, Helse Sunnmøre, Ålesund, Norway;* ²*Dept. of Thoracic Medicine, Haukeland University Hospital, Bergen, Norway;* ³*Dept. of Pathology, Haukeland University Hospital, Bergen, Norway*

Background: Few studies have measured both the costs and the effectiveness of different combinations of sampling techniques when bronchoscopies of peripheral lung lesions are evaluated.

Objective: To find the most cost effective combination of sampling techniques for peripheral lung lesions not visible by bronchoscopy.

Methods: 289 patients were included in an open prospective trial performed at the Haukeland University Hospital and Aalesund Hospital in Norway, from June 2005 to January 2008. All sampling techniques (biopsy, brushing, trans-bronchial needle aspiration (TBNA), and washing) were performed in 178 cases (study sample). The costs from the Department of Thoracic Medicine and the Department of Pathology were calculated for each sampling technique. The combined diagnostic yield for benign and malignant disease was the effectiveness measurement. The willingness to pay for one additional positive sample was estimated to be 2800 euro, based on the cost for 5 days in a day ward and the cost of one additional investigation. The combination was cost-effective when the incremental cost-effectiveness ratio (ICER) was below the willingness to pay.

Results: The detection rate for cancer increased from 36.7% for biopsy alone to 43.8% for biopsy and brushing. The ICER was 1211 euro for biopsy and brushing

TUESDAY, SEPTEMBER 27TH 2011

compared to biopsy alone. Addition of washing or TBNA to biopsy and brushing was not cost-effective for peripheral lesions (ICER washing: 4761 euro, ICER TBNA: 8262 euro)

Conclusion: Biopsy and brushing was the most cost-effective combination of sampling techniques for peripheral lesions.

4528

The effect of forceps type on results and complications of transbronchial lung biopsy

Hamidreza Jabbarjarjani, Alireza Eslaminejad, Arda Kiani. *NRITLD, Masih Daneshvari Hospital, Tehran, Islamic Republic of Iran*

Background: Lung biopsy via the bronchus (TBLB) is among the routine diagnostic procedures for pulmonary diseases and is performed using either of two different kinds of forceps: cup and alligator.

Objective: The purpose of this study was to compare the efficacy of two kinds of forceps on quality of biopsy as well as the side effects of TBLB.

Methods: This was a prospective, observational and double-blind study in which four samples were biopsied from each patient via TBLB. The sample characteristics were recorded based on size, number of alveoli included, diagnostic value, and the side effects such as pneumothorax and bleeding.

Findings: A total number of 44 patients and 176 biopsies were evaluated. Twenty one patients (47.7%) were males and 23 (52.3%) females. While considering the size of samples, of 88 biopsies via alligator forceps, 21.6% were small, 45.5% medium, and 33% large. Corresponding results for the cup forceps were 43.2% small, 29.5% medium, and 27.3% large. From 88 biopsies taken using alligator forceps, 18.2% were found to have diagnostic value whereas in the case of cup forceps the diagnostic value was 23.9%. While no significant pneumothorax was seen with alligator forceps it was observed in 9% of the cup forceps procedures. Significant bleeding was seen in 1% of the alligator forceps and 5.7% of the cup forceps procedures.

Conclusion: Comparing two types of forceps regarding the effect on results of TBLB, alligator forceps produced larger samples ($P=0.008$) and less side effects ($P=0.002$). There was no significant difference in diagnostic value between two procedures ($P=0.355$).