APSR RESPIRATORY UPDATES

Inside this issue: Endobronchial Ultrasonography (EBUS)

Articles selected and commented on by: **Prof. Noriaki Kurimoto**, Department of Chest Surgery, St. Marianna University, School of Medicine, Kawasaki, Japan, Email: kurimoto@marianna-u.ac.jp

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Ultrathin Bronchoscopy with Multimodal Devices for Peripheral Pulmonary Lesions: A Randomized Trial

Authors: Oki M, et al.

Reference: Am J Respir Crit Care Med Vol 192, Iss 4, pp 468–476, Aug 15, 2015.

URL: http://dx.doi.org/10.1164/rccm.201502-0205OC

Comments: The ultrathin bronchoscopes did not allow to use EBUS before, this article provided the usefulness of a novel ultrathin bronchoscope (outer diameter 3mm) using EBUS. Oki et.al compared the diagnostic yield of transbronchial biopsy under EBUS, fluoroscopy, and virtual bronchoscopic navigation guidance using the novel ultrathin bronchoscope (outer diameter 3 mm) with that using a thin bronchoscope (outer diameter 4 mm) with a guide sheath for peripheral pulmonary lesions.

Patients were randomized to undergo transbronchial biopsy with EBUS, fluoroscopy, and virtual bronchoscopic navigation guidance using a 3.0-mm ultrathin bronchoscope (UTB group) or a 4.0-mm thin bronchoscope with a guide sheath (TB-GS group). The ultrathin bronchoscope could reach more distal bronchi than the thin bronchoscope (median fifth- vs. fourth-generation bronchi). Diagnostic histologic specimens were obtained in 74% of the UTB group and 59% of the TB-GS group. The diagnostic yield of the UTB method is higher than that of the TB-GS method.

The novel ultrathin bronchoscope with EBUS, fluoroscopy, and virtual bronchoscopic navigation guidance provided higher diagnostic yield. But I think EBUS-GS has several merits of confirmation of biopsy site, less bleeding, and so on. In the near future, I hope we could use an ultrathin bronchoscope with a bigger working channel using EBUS probe covered by the Guide Sheath.

Pulmonologist-performed transoesophageal sampling for lung cancer staging using an endobronchial ultrasound video-bronchoscope: an Australian experience

Authors: Wimaleswaran H, et al.

Reference: Intern Med J. 2017 Feb; 47(2):205-210.

URL: http://onlinelibrary.wiley.com/wol1/doi/10.1111/imj.13330/full

Comments: In these years, some articles provided that transoesophageal fine-needle aspiration using convex probe bronchoscope (EUS-B-FNA) increased diagnostic yields on the evaluation of mediastinal and hilar lymph nodes.

This article elicited whether combining EUS-B-FNA and EBUS bronchoscopy enhances the diagnostic yield of mediastinal nodal staging in lung cancer. EUS-B-FNA sampling was performed at 69 mediastinal LN lesion sites, including 17 sites inaccessible to bronchoscopic sampling. Four left adrenal gland (LAG) lesions were sampled via EUS-B-FNA. Diagnostic sensitivity of EUS-B-FNA for malignancy in mediastinal LN lesions was 88% (51 of 58). For mediastinal LN lesions not amenable to EBUS-TBNA (endobronchial ultrasound-guided transbronchial needle aspiration), the sensitivity for diagnosis of malignancy via EUS-B-FNA was 88% (15 of 17). Diagnostic sensitivity of EUS-B-FNA for malignancy in LAG lesions was 50% (2 of 4). There were no complications.

EUS-B-FNA enables accessibility to paraesophageal lymph nodes, especially station 5, 8, and 9. When cyto-histological specimens of EBUS-TBNA would be insufficient, EUS-B-FNA for mediastinal LNs and left adrenal gland lesions by pulmonologists would be a next appropriate procedure. The lack of endoluminal landmarks within esophagus during EUS-B-FNA required interpretations of the sonographic image and knowledge of surrounding vascular structures. I recommend that the pulmonologist would seek support and potentially training from gastroenterology colleagues.

The predictive value of endobronchial ultrasonography with a guide sheath in the diagnosis of the histologic subtypes of lung cancer

Authors: Takeuchi Y, et al.

Reference: Respir Investig. 2016 Nov; 54(6):473-478

URL: http://dx.doi.org/10.1016/j.resinv.2016.05.003

Comments: Is the cyto-histological diagnosis by EBUS-GS corresponding to the histological diagnosis of resected specimens by operations?

This article evaluated the consistency between the types of lung cancer histologically diagnosed by bronchial biopsy or cytologically by EBUS-GS, and the final diagnosis of the resected specimen. Of the 40 cases diagnosed as squamous cell carcinoma (Sq) by EBUS-GS, 37cases were diagnosed as Sq, and 3 cases were diagnosed as non-Sq after surgical resection. Of the 159 cases diagnosed as non-Sq by EBUS-GS, 151 cases were diagnosed as non-Sq, 6 as Sq, and 2 as small cell carcinoma after surgical resection. These results showed that the positive predictive value of EBUS-GS in the diagnosis of Sq was 93%, and its positive predictive value in diagnosing non-Sq was 95%.

As biomarker analyses have become extremely essential, biopsy specimens as much material as possible needs to be preserved for molecular testing. EBUS-GS has an advantage of repeatedly obtaining many samples using the inserted GS. The pathological subtyping of NSCLC using tissue and cytology samples obtained by EBUS-GS appeared to effectively distinguish between Sq and non-Sq.

Endobronchial ultrasonography with guide sheath versus computed tomography guided transthoracic needle biopsy for peripheral pulmonary lesions: a propensity score matched analysis

Authors: Wang C et al

Reference: J Thorac Dis 2016; 8(10):2758-2764

URL: http://dx.doi.org/10.21037/jtd.2016.09.52

Comments: Which procedure of computed tomography guided transthoracic needle aspiration (CT-TTNA) or endobronchial ultrasonography using a guide sheath (EBUS-GS) is a better procedure to diagnose peripheral pulmonary lesions (PPLs)?

This article was a retrospective analysis of a prospective registry with propensity matching. Patients with PPLs were divided into EBUS-GS group and CT-TTNA group according to patients' intent to treatment. Propensity score matching (PSM) was used to eliminate the intergroup bias. A total of 187 patients (CT-TTNA: 130; EBUS-GS: 57) were enrolled. After propensity score matching, 54 paired patients were included. Diagnostic yield was 81% (44/54) for EBUS-GS and 87% (47/54) for CT-TTNA (P=0.43), respectively. Diagnostic sensitivity in malignancy was 93% (42/45) for CT-TTNA and 79% (37/47) for EBUS-GS (P=0.04). Subgroup analysis revealed that the sensitivity of CT-TTNA was significantly higher in diagnosing of lesions close to the chest wall (100% vs. 80%, P=0.04), and bronchus sign on CT was a predictive factor for accurate diagnosis by EBUS-GS. The overall complication rate was 13% (7/54) for CT-TTNA group, which was not significantly higher than that of EBUS-GS group (2%, P=0.06). Subgroup analysis showed that patients combined with pulmonary comorbidities and lesions apart from chest wall were risk factors for complications of CT-TTNA.

EBUS-GS had few complications, and EBUS-GS would be more suitable for patients combined with pulmonary comorbidities and lesions with bronchus signs. In the future, the prospective study with large number of cases will be necessary.

Utility of endobronchial ultrasound-guided transbronchial needle aspiration in diagnosing non-specific inflammatory intrathoracic lymphadenitis

Authors: Yang H, et al

Reference: Clin Respir J 2016; 00: 000–000 DOI:10.1111/crj.12580.

URL: http://dx.doi.org/10.1111/crj.12580

Comments: We sometimes experienced non-specific inflammation of the specimens by EBUS-TBNA.

This article reported the utility of EBUS-TBNA for the diagnosis of non-specific inflammatory intrathoracic lymphadenitis. One hundred ninety-one lesions were aspirated in 94 patients with enlarged mediastinal/hilar lymph nodes within reach of EBUS-TBNA, which were diagnosed as non-specific intrathoracic lymphadenitis by pathology and clinical follow-up. According to EBUS-TBNA pathologies, 94 patients were categorized into four kinds: (i) inflammatory cell infiltrates and/or noncaseating necrosis in 38 cases; (ii) granuloma formed by epithelioid cells and/or fiber hyperplasia in 13 cases; (iii) lymph node tissue/lymphocyte without obvious abnormal lesions in 41 cases; (iv) inadequate sample in 2 cases. Bacterial and/or fungal smears and cultures were carried out in all 94 patients (100%), with pathogens being found in 4 (4.3%) cases. All patients (100%) underwent acid-fast staining and culture for mycobacterium tuberculosis to exclude tuberculosis.

EBUS-TBNA was an effective procedure for evaluating inflammatory intrathoracic lymphadenitis. I think that sonographic features of inflammatory intrathoracic lymphadenitis by EBUS should be studied in the future.

Cell block samples from endobronchial ultrasound transbronchial needle aspiration provide sufficient material for ancillary testing in lung cancer—a quaternary referral centre experience

Authors: Hopkins E, et al.

Reference: J Thorac Dis 2016; 8(9):2544-2550

URL: http://dx.doi.org/10.21037/jtd.2016.08.74

Comments: How to use Rapid on site examination (ROSE) and cell block for cytological evaluation?

This article reported the diagnostic yield of on-site smears vs. cell block and the provision of cellular material for ancillary testing. Diagnostic yield on smears versus cell block was recorded. Cell blocks were reviewed by an experienced pathologist to determine diagnostic accuracy and whether IHC and molecular testing were possible. For malignancies, smear diagnosis was possible in 95% (96/101) of cases and cell block diagnosis in 93.5% (87/93) of cases. There was sufficient material for IHC in 97.7% (85/87) of malignant cases. In 79.3% (69/87) of NSCLCs molecular testing for epidermal growth factor receptor (EGFR) mutation analysis was theoretically possible on samples obtained.

ROSE assisted the physician on how to manage samples for ancillary testing. Cell blocks are not inferior to smears for diagnosis of malignancy and provided sufficient samples for histology.

Accuracy and consequences of same-day, invasive lung cancer workup _ a retrospective study in patients treated with surgical resection

Authors: Madsen K, et al.

Reference: Eur Clin Respir J. 2016 Nov 30; 3: 32590

URL: http://dx.doi.org/10.3402/ecrj.v3.32590

Comments: This article evaluated the accuracy and efficacy of same-day, invasive lung cancer workup, and to identify differences between patients without (Group A: patients with completed diagnosis and staging after a single visit) or with (Group B: patients requiring 2 visits) need for resampling.

A total of 129 patients (peripheral lesion: 84%; mediastinal staging: 97%) were included. After same-day, invasive workup, 71% had no need for further invasive workup (Group A), while 29% had (Group B). Group A differed significantly from Group B in fewer invasive tests, fewer days from referral to surgery, and lower pneumothorax incidence, while no differences were observed in diagnostic accuracy, cancer subtype, tumor size, tumor stage, peripheral lesion, nodal involvement, gender, or presence of chronic obstructive pulmonary disease.

This retrospective study suggests that same-day, invasive workup for lung cancer was safe and efficacious in reducing time to therapy. I hope the prospective study would be performed in the future.

Bispectral Index Monitoring Reduces the Dosage of Propofol and Adverse Events in Sedation for Endobronchial Ultrasound

Authors: Quesada N

Reference: Respiration. 2016; 92 (3):166-75.

URL: http://dx.doi.org/10.1159/000448433

Comments: Is Bispectral Index Monitoring useful to maintain sedation of bronchoscopy?

This article reported the usefulness of monitoring by means of the bispectral index (BIS) in patients undergoing EBUS. A randomized cohort study of 90 patients with mediastinal lymph node involvement and/or lung or mediastinal lesions for whom EBUS was indicated, comparing the modified observer's assessment of alertness/sedation scale clinical evaluation (n = 45) versus the BIS evaluation (n = 45) of sedation with propofol-remifentanil, was conducted in order to evaluate the clinical parameters, doses used, adverse events, and tolerance of the procedure. The results provided a shorter waking time and a significantly lower dose of total propofol in the BIS group. Significantly fewer overall adverse events were recorded in the BIS group and included desaturation, hypotension, and bradypnea. Tolerance was better in the BIS group.

BIS monitoring of sedation in EBUS reduced the dosage of propofol and adverse events, and shortened the waking time. In the next step, we should compare the cost of this monitoring with the clinical benefits.

Conventional Transbronchial Needle Aspiration Versus Endobronchial Ultrasound -guided Transbronchial Needle Aspiration, With or Without Rapid On-Site Evaluation, for the Diagnosis of Sarcoidosis: A Randomized Controlled Trial

Authors: Madan K, et al

Reference: J Bronchology Interv Pulmonol. 2017 Jan; 24 (1):48-58.

URL: http://dx.doi.org/10.1097/LBR.0000000000000339

Comments: This article provided the utility of rapid on-site evaluation (ROSE) in a comparative evaluation of EBUS-TBNA versus conventional TBNA (c-TBNA) for the diagnosis of sarcoidosis.

In this article, eighty patients with suspected sarcoidosis were randomized into 4 groups: c-TBNA without ROSE (TBNA-NR), c-TBNA with ROSE (TBNA-R), EBUS-TBNA without ROSE (EBUS-NR), and EBUS-TBNA with ROSE (EBUS-R). Overall, granuloma detection was not significantly different between the 4 groups (68% in TBNA-NR, 89% in TBNA-R, 84% in EBUS-NR, and 83% in EBUS-R groups, P=0.49). The yield of c-TBNA in the TBNA-NR group was lower compared with that in TBNA-R group and EBUS-TBNA in EBUS groups (32%, 72%, 68%, and 67% for TBNA-NR, TBNA-R, EBUS-NR, and EBUS-R groups, respectively, P=0.04). Additional 20% patients were diagnosed when EBUS-TBNA was performed following a nondiagnostic bronchoscopy procedure in the TBNA-NR group.

When performing TBNA in the setting of suspected sarcoidosis, we found c-TBNA with ROSE and EBUS-TBNA (with or without ROSE) to be superior to c-TBNA alone. ROSE would be an important factor to diagnose sarcoidosis with TBNA.

Pulmonologist-performed Per-Esophageal Needle Aspiration of Parenchymal Lung Lesions Using an EBUS Bronchoscope: Diagnostic Utility and Safety

Authors: Steinfort D, et al.

Reference: J Bronchology Interv Pulmonol. 2016 Dec 21.

URL: http://dx.doi.org/10.1097/LBR.0000000000000350

Comments: This article reported safety, diagnostic accuracy, and feasibility of endoscopic ultrasound fine-needle aspiration using convex probe bronchoscope (EUS-B-FNA) in evaluation of pulmonary parenchymal lesions.

This article was a prospective observational cohort study. EUS-B-FNA sampling of parenchymal lesions was performed in 27 patients. Ten target lesions (36%) located as inaccessible to bronchoscopic sampling via the airways, and 9 lesions were inaccessible to EBUS-TBNA and low diagnostic yield from radial EBUS. EUS-B-FNA was diagnostic in 26 patients (96%), and sensitivity of EUS-B-FNA was 100% (95% confidence interval, 87%-100%) for both lung cancer (n=21) and for pulmonary metastatic lesions (n=5). Pneumothorax occurred in 1 patient (3.7%, 95% confidence interval, 0.001%-19%).

When the peripheral pulmonary lesion is located just beside esophagus, it is sometimes difficult to perform CT guided transthoracic needle aspiration and transbronchial biopsy. EUS-B-FNA might access to sites inaccessible to transbronchial sampling, and increase diagnostic accuracy in patients.

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Articles selected and commented on by Prof. Noriaki Kurimoto, Department of Chest Surgery, St. Marianna University, School of Medicine, Kawasaki, Japan.

Editor in chief: Dr David CL Lam, Department of Medicine, University of Hong Kong, Hong Kong, SAR China.

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