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Diagnostic performance/learning curve and tolerance of endobronchial ultrasound (EBUS)

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Objectives: To analyze the diagnostic performance of transbronchial needle aspiration guided by endobronchial ultrasound (EBUS-TBNA) in diagnosing hilar/mediastinal lymphadenopathies and/or lung masses in our department and the possible effects of the learning curve.To evaluate the tolerance of the procedure by both the patient and the doctor and its complications.
Materials and methods: Retrospective study of all patients referred to our department (January 2010-October 2011)to perform EBUS-TBNA.At the end of the technique, both the patients and bronchoscopist answered a tolerance questionnaire (scale of 0 to7).
Results: n=129 patients. 325 aspirations were performed.The most common indication was suspicion of malignancy (48.8%).The most frequent final diagnosis was normal lymph nodes (46.5%),followed by neoplasm (35.6%).The sensitivity (S)and negative predictive value (NPV)for the final diagnosis of malignancy was 93,4% and 95.5%,respectively.In order to analyze learning curve effects,we study the first 25 cases and the remainder,separately,with the S and NPV of 83.3% and 94.1%,respectively,without statistically significant differences.In 63.56%,the tolerance of the technique was 5.18±2.12vs4.62±2.41 (patient vs.bronchoscopist).With regard to complications,90.7% did not register any complication.
Conclusions: EBUS-TBNA is a diagnostic tool with a high profitability in the study of hilar/mediastinal lymphadenopaties which was higher in neoplastic lymphadenopathy.In our case,there were no statistically significant differences regarding the diagnostic performance of the technique during the learning curve. EBUS-TBNA is a safe and well-tolerated method by both the patient and the endoscopist.

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Modified technique for endobronquial ultrasound-guided transbronchial needle sampling of the mediastinum

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Background: The endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a method of endoscopic diagnosis for study of mediastinal involvement. Fine needle capillarity sampling has been applied in other organs and not for transbronchial sampling. We present our results using capillarity sampling techinque at our institution.
Methods: We included all patients undergoing EBUS exploration between January 1 to August 31 of 2011 in the Pulmonology Department at Clinica Universidad de Navarra in Pamplona, Spain. The samples were collected by capillarity (FNC). No suction was applied with the Vaclock syringe and the inner stylet was never completely removed, as dictated by the classical technique.
Results: Forty-four patients (75% male) were included in the study. EBUS exploration of the mediastinum identified lymphadenopathy or mediastinal masses in 38 patients (86,4%). More than one lymph node was sampled in 23 patients (52,3%). The analysis of samples reported that all punctures in Lymph nodes with the capillarity tech nique provided adequate and representative material for interpretation, with a diagnostic yield of 86.8%. The diagnostic sensitivity achieved with EBUS-FNC for adequate sameples was 88%, and 84,1% considering all samples. Complications were reported in only two patients (4.5%).

Performance of EBUS-FNC with respect to site punctured

		EBUS-FNC diagnosis		Total
		Yes	No	
Lymph node	Yes	33	5	38
	No	4	2	6
Total		37	7	44

Conclusions: Our study suggests that the modified technique (EBUS-FNC) is safe and comparable in terms of efficacy and sample adequacy to EBUS-TBNA yields. Furthermore, it is arguably simpler than the classical technique.

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Lymph node core retrieval comparison between 22 and 21 gauge EBUS-TBNA needle

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Introduction: Yield of EBUS-TBNA depends upon the quality of aspirate/core obtained.
Aim: Analysis of diagnostic yield of lymph node aspirate using 22 and 21 gauge EBUS-TBNA needle.
Methods: A retrospective analysis was performed on 72 consecutive patients who underwent EBUS-TBNA. Of 72 patients first 44 patients underwent EBUS- TBNA using 22 gauge needle and subsequent 28 patients underwent EBUS-TBNA using 21 gauge needle. EBUS-TBNA was performed by single experienced interventional pulmonologist under sedation. By coincidence, since availability of 21 gauge needle suction is not being routinely applied for initial passes. Needle is moved back and forth without suction. Suction with provided syringe is applied only

Table 1. Diagnostic yield

	EBUS-TBNA using 21 gauge needle	EBUS-TBNA using 22 gauge needle
Total patients	28	44
Histology core samples available	26 (92.8%)	23 (52.2%)
Histological opinion possible	19 (67.8%)	10 (22.7%)
Final diagnosis possible	21 (75%)	35 (79.5%)
Diagnosis on histology only	8 (28.5%)	4 (9%)
Diagnosis on cytology only	1 (3.5%)	26 (59%)

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Table 2. Final Diagnosis based on EBUS-TBNA

Diagnosis	Total, n (%)
Granulomatous Inflammation	39 (54.1)
Non granulomatous Inflammation	3 (4.1)
Malignancy	17 (23.6)
Inconclusive	13 (18)

when adequate sample is not obtained. Samples obtained were sent: immersed in formalin, slides smears and solution for AFB culture & TB-PCR.
Results: The total diagnostic yield of EBUS-TBNA was 59 (81.9%).
Conclusion: Lymph node core retrieval appears to be better with less bloody aspirate using 21 gauge EBUS needle. Core retrieval might be helpful for further laboratory processing like for histopathology, IHC markers, gene mutation studies & AFB culture.

P281
Achieving core biopsies for histology using gauge 21 needle during endobronchial ultrasound guided transbronchial needle aspiration
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Introduction: Endobronchial ultrasound guided transbronchial needle aspiration (EBUS – TBNA) is a safe method for sampling mediastinal lymph nodes. A dedicated 22 or 21 gauge (G) needle is used to perform EBUS-TBNA. The 22G needle provides material for cytology. The 21G needle is stiffer and allows larger samples.
Objective: To evaluate whether the material obtained using 21G needle will be suitable for histological assessment and to determine the safety of the procedure.
Methods: 106 consecutive patients were included. The samples obtained by 21G needle were received as friable cores of tissue. Their size was suited for histological processing and examination as biopsies. Microbiology was performed in selected cases.
Results: Core biopsies were obtained in 105 patients (99%). Malignancy was confirmed in 51 patients (48%). The histology of 21 (20%) participants showed granulomatous inflammation. Normal lymph node or reactive changes were reported in 22 (21%) cases. The samples of the remaining 11 (10%) patients were not representative. 3 patients with suspicious of malignancy imaging and negative histology underwent mediastinoscopy which reconfirmed reactive lymph tissue. EBUS-TBNA material was sufficient for EGFR testing. In 3 patients tuberculosis was confirmed by microbiology culture. The procedure was completed in all patients but one. 15 (14%) patients had significant cough, 2 (2%) patients complained of chest discomfort and 5 (5%) developed transient hypoxia, which did not require termination of the procedure.
Conclusion: Using 21 G needle for EBUS -TBNA is safe. It provides core biopsies for histological evaluation of mediastinal lymphadenopathy.

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Using forceps biopsy during endobronchial ultra sound is feasible in routine practise?
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Introduction: EBUS is becoming a gold standard in exploring mediastinum abnormality. Especialy during a staging in lung cancer, big tissue become more necessary.
Forceps biopsy have been used in biopsy of subcarinal masses with interesting results for lymphomas or sarcoidosis, without major complications. What happend in routine practise and using forceps for other mediastinal sites ?
Material and methods: In the thoracic endoscopic unit of the hopital St Joseph (Marseille, France) during June 2011-decembrer 2011, we used a pediatric forceps biopsy after each puncture by EBUS TBNA. 13 patients were analysed, 16 mediastinal sites (7, 4R, 10R, 11R, 12R, 4L, 11L) were biopsied (3 histological specimens) after using a 21 or 22G needle. All the procedures were doing under general anesthesia using a laryngeal mask.
Results: The average diameter of lymph nodes was 15,3 mm. In only two samples, the results were non significant. Concerning cancerous results (50%), the forceps biopsy did not increase diagnostic yield versus TBNA (Slides or cytolit). Biomarker analyses were possible for metastasis patients. In one case, sarcoidosis diagnosis was made only with forceps biopsy. There were no immediate complications.
Conclusion: Using forceps biopsy during EBUS is feasible and safe. We can perform this procedure for the different sites of the mediastinum. The result doesn't show an increasing diagnostic value in lung cancer but could be interresting for lymphoma or non malignant disorders as sarcoidosis.

P283
Endobronchial ultrasonography: Initial experience at a reference center in South America
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Introduction: Minimally invasive diagnostic procedures as endobronchial ultrasound-transbronchial needle aspiration (EBUS-TBNA), have been incorporated to the diagnostic algorithm of mediastinal pathologies or lesions adjacent to the central airways. There are multiples publications on its diagnostic performance in Europe, North America and Asia, but not in South America.
Objective: To report the initial experience in EBUS-TBNA in a reference center of South America.
Patients and methods: Retrospective analysis of consecutive patients in whom EBUS-TBNA was performed for mediastinal and/or hiliar lesions or lesions adjacent to central airways, demonstrated by chest CT-scan. Demographic information, lesions number, localization, and size together with definitive diagnosis, and complications of the procedure, were registered. Sensitivity, specificity, predictive values and accuracy were calculated.
Results: 129 lesions were punctured in 85 patients (47 males), mean age of 62.8 years (25-86). Stations 4R, 7, 10R and 4L were the most frequently sampled. 82% were lesions of 20mm or less. Lung cancer and metastatic disease were the most common diagnosis (62%). Sensitivity 91% (CI 95%: 84-96), specificity 100% (CI 95%: 82-100), positive predictive value 100% (CI 95%: 94-100), negative predictive value 72% (CI 95%: 53-86), accuracy 93%. No complications were reported.
Conclusion: Our series has demonstrated the usefulness of EBUS-TBNA for the diagnosis of madiastinal lymph nodes or lesions adjacent to the central airways, in a Latin American reference center. Our diagnostic accuracy has been in agreement with previously published results in centers of Europe, Asia, and Northamerica.

P284
Complications and diagnostic outcome of endobronchial ultrasound (EBUS) guided transbronchial needle aspiration (TBNA) of mediastinal lymph nodes
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Background: EBUS guided TBNA enables tissue sampling of mediastinal lymph nodes with sensitivity and specificity comparable to mediastinoscopy in nodal staging of lung cancer. It is generally safe but not without complications.
Objectives: We studied the complications and diagnostic outcome of EBUS-TBNA performed under local anaesthesia and conscious sedation using intravenous midazolam and pethidine in the endoscopy suites.
Methods: We retrospectively studied consecutive EBUS examinations performed over 28 months since July 2008. Pathology and clinical follow-up data till end of 2010 were reviewed.
Results: Totally 110 EBUS -TBNA were performed in the study period.
Complications occurred in 21 (19%) patients. Difficulty in conscious sedation accounted for the majority (12 patients, 11%) including oversedation requiring antidotes (2), failed sedation (2) and one struggling patient leading to probe damage. Other complications included moderate bleeding of 15cc blood loss (2), bronchospasm (2), fever (1), pneumonia (1), paroxysmal atrial fibrillation (1). No long term adverse effect was found after EBUS-TBNA.
Among 80 patients referred for nodal staging of lung cancer, 131 lymph nodes were sampled, resulting in 53 true positives, 20 true negatives, 7 nondiagnostic TBNA. The sensitivity of EBUS-TBNA for diagnosing metastatic lymph node disease was 88.3% and the specificity was 100%. The diagnostic yield of EBUS-TBNA was 68% in 30 patients with inflammatory diseases including tuberculosis.
Conclusion: EBUS-TBNA is a safe procedure with reasonable diagnostic value and its complications were mostly associated with conscious sedation.

P285
Impact of multiple operators on diagnostic yield of EBUS-TBNA
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Background: EBUS-TBNA is usually performed by a limited number of operators in each institution in order to achieve optimal yield by accumulating individual expertise. We aimed to assess the diagnostic performance and safety of EBUS-TBNA when this procedure is learned by every trainee.
Methods: All consecutive patients undergoing EBUS-TBNA were prospectively included since the introduction of EBUS in our institution in January 2008 until December 2011. Each procedure was done by 2 or 3 operators including 1 senior supervisor. Rapid on-site cytologic evaluation (ROSE) was performed since June 2011. Predicting factors for the diagnostic accuracy of EBUS-TBNA were analyzed per patient and per sampled lymph node.

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Results: 15 operators performed EBUS-TBNA in 160 patients. Definitive diagnosis was available for 156 patients (mean age 59.4±14.6 years, 38.5% F). Lymph nodes were malignant in 53.2%. Overall diagnostic accuracy was 82.7% (95% CI 76.4–88.2) and 90.3% (95% CI 81.9–97.2) for NSCLC and SCLC (n=72). Overall diagnostic accuracy tended to increase over years: 70.6%, 81.8%, 82.9% and 85.9% in 2008, 2009, 2010 and 2011 respectively (p=0.51). Subgroup analysis showed no significant influence of ROSE, number of sampled nodes per case, localization and size of lymph node and SUV ^{max}. Complications were restricted to 3 minor endobronchial bleeding.
Conclusions: At Geneva University Hospitals, EBUS-TBNA performance increased over years following well-known learning curves. Yet, in our setting, EBUS- learning curve seemed rather center-than operator-related. Providing on site direct supervision by a senior-experienced operator, EBUS is indeed constantly performed by junior operators without affecting the performance of the method.

P286
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) under conscious sedation: Patient satisfaction in a UK tertiary centre
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Background: There is a variation in the modality of sedation/anaethesia used during EBUS-TBNA. Despite this, there are no studies assessing patient satisfaction. We therefore conducted a prospective study to characterize patient satisfaction with EBUS-TBNA performed under conscious sedation.
Methods: 101 consecutive patients (mean age 64) undergoing EBUS using topical lignocaine and iv midazolam were evaluated using a structured questionnaire 2 hrs post procedure.
Results: The mean dose of lignocaine throat spray was 178 mg and 99% received transtracheal lignocaine. The mean dose of iv midazolam was 3.3 mg and all patients were adequately sedated. 161 lymph nodes (stations 2, 4, 7, 10 & 11) were biopsied with a mean size of 1.7 cm (range 0.6-4 cm, less than 1 cm nodes 22). Mean duration of procedure was 20 mins and the mean number of needle passes per node was 2.3. EBUS was diagnostic in 96% and there were no complications.

Frequency of reported symptoms (%) during EBUS-TBNA

Symptoms	Unable to recall	None	Small amount	Significant amount
Discomfort from throat spray	6	18	63	13
Discomfort from transtracheal injection	26	51	23	0
Discomfort from camera insertion	22	43	30	5
Cough	13	24	50	13
Throat pain	4	43	49	4
Chest pain	6	72	22	0

86% were tolerant of the procedure and the overall patient satisfaction was 97% (good - excellent). 78% would definitely return and 19% would probably return for a repeat procedure if needed.
Conclusions: EBUS-TBNA under conscious sedation is safe and well tolerated. Conscious sedation is physician delivered and less resource intensive, and therefore could be adopted as the method of choice as EBUS services continue to expand.

P287
Assessing the learning curve for EUS(b)-FNA in comparison with classical 'blind' TBNA
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Background: Transbronchial needle aspiration (TBNA) is a challenge due to very flat learning curve. Now, EUS and EBUS significantly improved the results of TBNA. Nevertheless, number of 'learning' procedures to become an expert in this type of biopsy is controversial.
Aim: To evaluate the learning curve for EUS(b)-FNA versus classical 'blind' TBNA in a tertiary center.
Materials: Patients with chest lymphadenopathy with main suspicion for sarcoidosis referred to the bronchoscopy were randomized 1:1 to EUS(b)-FNA (arm A) or classical blinded TBNA (Arm B). All procedures performed under local anesthesia by experienced endoscopist with no skills for both techniques, under expert control. Position 7 or 4L were punctured in both groups. Age, sex, size of lymph nodes by CT, number of biopsies, duration of procedure, complications, quality of diagnostic material and diagnostic yield were assessed.
Results: 56 patients were enrolled into the study, with 28 for each arm. Patients were comparable in age (mean 44,2 yrs) and sex (men 34/56), and size of target lymph nodes (27±5 mm). There were no complications. Median duration of procedure in arm A reduced from 9 min for first 5 pts to 4 min in last 5 pts ($p<0.05$), for arm B from 7 to 3 min ($p<0.05$). Median number of biopsies was equal in both groups - 3. Acceptable biopsy quality (>80%) reached plateau after 15 patients (42 biopsies) in group A and 25 pts (67 punctures) in group B ($p<0,05$). Diagnostic yield was higher in a group A: 75% versus B: 64,3% ($p<0.05$).
Conclusion: The learning curve of EUS(b)-FNA estimates a number of procedures to achieve an acceptable level of performance in 15 procedures, whereas classical TBNA needs 10 procedures more.

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The usefulness of endobronchial ultrasound-guided transbronchial needle aspiration for the diagnosis of sarcoidosis
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We evaluated the usefulness of endobronchial ultrasound guided-transbronchial needle aspiration (EBUS-TBNA) for the diagnosis of sarcoidosis in comparison with transbronchial lung biopsy (TBLB), endobronchial biopsy (EBB), and bronchoalveolar lavage (BAL). The consecutive patients who were suspicious for sarcoidosis (stage I and II) on chest radiography and chest computed tomography scan were included in the study. All study patients underwent EBUS-TBNA, TBLB, EBB and BAL at the same session. Between July 2009 and June 2011, 33 patients underwent EBUS-TBNA, TBLB, EBB, and BAL. EBUS-TBNA was performed for 71 lymph node stations. Among these 33 patients, 29 patients were diagnosed as histology proven sarcoidosis and two patients were compatible with clinical diagnosis of sarcoidosis during follow-up. The other two patients were diagnosed as metastatic carcinoma and reactive lymphadenopathy. Among 29 patients with histology proven sarcoidosis in combination with EBUS-TBNA, TBLB, and EBB, only EBUS-TBNA and TBLB revealed non-caseating granuloma in 18 patients and 1 patient, respectively. Overall diagnostic sensitivities of EBUS-TBNA, TBLB, EBB, and BAL (CD4/CD8 $\geq$3.5) were 90%, 35%, 6%, and 71%, respectively ($P<0.001$). Combined diagnostic sensitivity of EBUS-TBNA, TBLB, and EBB were 94%. In conclusions, EBUS-TBNA is most sensitive method for the diagnosis of stage I and II sarcoidosis compared with conventional bronchoscopic procedures. EUBS-TBNA could be considered first for the histopathologic diagnosis of stage I and II sarcoidosis.

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Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) for the diagnosis of intrathoracic lymphadenopathy in patients with extrathoracic malignancy: A study in a tuberculosis-endemic country
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Background: Mediastinal lymphadenopathy in patients with malignancy is a common clinical problem in tuberculosis-endemic countries. The recently developed endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) procedure enables direct and real-time aspiration of mediastinal and hilar lymph nodes and is a less invasive alternative to mediastinoscopy.
Aim: To determine the efficacy of EBUS-TBNA results in the evaluation of mediastinal lymph nodes in patients with extrathoracic malignancy.
Methods: Retrospective analysis was performed in 40 patients with proven (n=38) or suspected metastasis of unknown origin (n=2) who underwent EBUS-TBNA between July 2007 and August 2011.
Results: All 40 patients successfully underwent EBUS-TBNA and no complications were observed. In 16 (40%) patients, EBUS-TBNA demonstrated metastasis of extrathoracic malignancy. Two (5%) patients diagnosed as a new lung cancer with EBUS-TBNA. The diagnostic sensitivity, accuracy, and negative predicted volue (NPV) of EBUS-TBNA per patient were 90.0%, 95.0%, and 90.9%, respectively. Data about PET/CT scans were available in 33 patients. The diagnostic sensitivity, specificity, positive predictive volue (PPV), NPV and accuracy of PET/CT scan per patients were 94.7%, 35.7%, 66.6%, 83.3%, and 69.6% respectively.
Conclusion: EBUS-TBNA is a sensitive modality and can be considered as the initial test for the histopathological diagnosis of mediastinal and hilar lymphadenopathy in patients with extrapulmonary malignancy.

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The role of endobroncial ultrasound guided biopsy in diagnosis of mediastinal/hilar lympadenopathy in patients with extrathoracic malignancy
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Accurate diagnosis of enlarged hilar/mediastinal lymph nodes is mandatory for adequate management of patients with known primary malignancy. We aimed to determine the sensitivity,specificity,accuracy of EBUS-TBNA for clarification of the nature of enlarged hilar/mediastinal lymph nodes in patients with known extrathoracic malignancy. Patients with extrathoracic malignancy who had undergone EBUS-TBNA for assessment of enlarged hilar/mediastinal lymph nodes in December 2008-September 2011 were reviewed. 48 patients who underwent EBUS-TBNA

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were included. Mean age of 12 male,36 female patients was 57.38±11.60. Malignancy was detected in 18 (37.5%),tuberculosis in 6 (12.5%),sarcoidosis in 4 (8.3%),anthracosis in 2 (4.2%),reactive adenitis in 18 (37.5%). EBUS-TBNA was also found to offer an effective accurate and minimally invasive strategy for evaluating nonmalignant lesions of pathological hilar and mediastinal lymph nodes such as tuberculosis and sarcoidosis. The sensitivity and specificity of EBUS-TBNA for malignancy in patients with reference pathology was 83% and 100%,respectively. Negative predictive value for malignancy was 90%. Procedure-related complications were minor bleeding in 2,slight reversible desaturation in 1. When both benign and malignant diagnoses are considered sensitivity, specificity and negative predictive value were 88%, 100% and 88%, respectively. We conclude that EBUS is a safe,minimally invasive,inexpensive and accurate procedure for diagnosing mediastinal/hilar lymphadenopathy in patients with extrathoracic malignancy. Nevertheless,due to the possibility of underdiagnosis,an invasive technique is indicated when results are negative.

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Endobronchial ultrasound-guided transbronchial needle aspiration in the diagnosis of intrathoracic lymph node metastases from extrathoracic malignacy

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Aim: The aim of our study was to evaluate the contribution of EBUS-TBNA for diagnosing mediastinal metastases in patients with extrathoracic malignancy that underwent EBUS-TBNA for intrathoracic lymphadenopathy.
Patients & methods: We retrospectively reviewed all patients with a concurrent or a previous diagnosis of extrathoracic malignancy who where referred for EBUS-TBNA for clinical suspicion for mediastinal and/or hilar nodal metastases.In cases where EBUS-TBNA findings were positive for malignancy they were assumed to be true-positives and no tissue confirmation was requested.Patients to whom results were not malignant and no other benign alternative diagnoses was established underwent surgical confirmation or follow-up.
Results: Of 117 patients, 51 (43.5%) cases EBUS-TBNA revealed metastatic extrathoracic malignancy, 27 (23%) cases a primary thoracic malignancy and in 4 (3.4%)patients a benign diagnosis.In 35 were found normal lymph node, 14 (11.9%) underwent surgery. Other 21 (17.9%) patients who had normal lymph node underwent clinical and radiological follow-up: 13 (11.1%) confirmed stable or regressive lymphadenopathy and 8 (6.8%) patients developed radiological progression and were assumed to be false negative. The sensitivity and negative predictive value (NPV) for diagnosing thoracic nodal metastases from extrathoracic malignancy was 86.4% and 77.1% respectively.The overall accuracy was 86.3%.
Conclusion: EBUS-TBNA is an accurate method for the diagnosis of thoracic nodal metastases from extrathoracic malignancy with a sensibility of 86.4%, a NPV of 77.1% and an overall accuracy of 86.3%.

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The role of transthoracic ultrasound (TTS) in the diagnosis and management of post transbronchial lung biopsy (TBLB) pnemothorax (PTX)

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Background: TTS increasingly being used to detect PTX, however its utility in diagnosis and management of post TBLB PTX largely unknown.
Objective: To evaluate the accuracy of TTS in detection of post TBLB PTX.
Subjects and methods: TTS performed on 379 consecutive patients undergoing flexible bronchoscopy and TBLB (n=113). Disappearance of sliding lung and comettail artifacts considered evidence of PTX. Upright chest radiography (CXR) was performed after 2 hours of TBLB. CT chest performed in case of discrepancy between TTS and CXR. PTX was sonographically monitored by noting position of the lung point 2 hrly.
Results: PTX occurred in eight (7.1%) of TBLB patients. TTS depicted all cases of PTX while CXR did not depict one PTX, which was confirmed on CT. All PTX diagnosed immediately post procedure by TTS in the bronchoscopy suite itself. Sensitivity, specificity, positive predictive value, negative predictive value, and overall accuracy were all 100% for TTS and 87.5%, 100%, 100%, 99.6%, and 99.6%, respectively, for CXR. The 95% confidence intervals (CI) for the sensitivity, negative predictive value, and overall accuracy were 46.7% to 99.3%, 95.6% to 100%, and 56.1% to 100% for CXR. Any shift of the lung point towards the base of lungs (below Mid thoracic line) favored single time aspiration (done in 2 cases) or ICTD insertion (1 case), while conservative management done in cases where lung point shifted towards apex (Above Mid thoracic line).
Conclusion: These preliminary results suggest that TTS is as effective as CXR in the detection of PTX after TBLB and may become the method of choice for excluding, diagnosing, and monitoring PTX after TBLB.

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The diagnostic yield of ultrasound-assisted closed pleural biopsy in pleural effusions following non-diagnostic thoracocentesis

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Background: Unaided ("blind") pleural biopsy is prone to sampling error and has a modest yield. We assessed the safety and yield of ultrasound (US)-assisted closed pleural biopsy in the setting of undiagnosed effusions, and investigated how pleural morphology could guide the selection and execution of closed pleural biopsy.
Methods: Patients with an exudative effusion who had had a non-diagnostic thoracocentesis were prospectively stratified on imaging as having (A) an associated mass lesion (>10mm) abutting the chest wall; (B) diffuse pleural thickening (>10mm) and/or nodularity or (C) insignificant/no pleural thickening. US-assisted repeat thoracocentesis and transthoracic fine-needle aspiration (TTFNA) were performed on patients stratified to (A),and if non-diagnostic on on-site analysis, followed by a Tru-Cut biopsy. US-assisted thoracocentesis and Abrams needle biopsies were performed on all others aiming at the region(s) of interest (B) or low supra-diaphragmatic pleura (C).
Results: Final diagnoses in 41 consecutive patients (30 males, 47±18 years) included pleural TB (n=21), malignancy (n=16) and other causes (n=4). Accurate diagnoses were obtained in 34 (82.9%) with US-assisted biopsy; thoracoscopy (n=6, 14.6%) or bronchoscopy (n=1) were required in the rest. The yield of US-assisted biopsy was higher for TB (19/21, 90.48%) than malignancy (12/16, 75.0%, p=0.37). One patient experienced mild haemoptysis following TTFNA.
Conclusion: A diagnostic algorithm based on pleural morphology and US-assisted pleural biopsy has a high diagnostic yield and offers a safe first-line approach in the setting of undiagnosed pleural exudates.

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Highly diagnostic yield of ultrasound-guided pleural biopsy for exudative lymphocytic pleural effusion

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Background: Pleural biopsy is diagnostic tools for etiological diagnosis of lymphocytic pleural effusion (PE), conventionally performed without ultrasound (US) guidance. However, the benefit of US-guided pleural biopsy has not clearly demonstrated.
Materials and methods: To assess the diagnostic value of the US-guided pleural biopsy, we prospectively enrolled 54 patients with nondiagnostic exudative PEs between May, 2011 and January, 2012 at Phramongkutklao Hospital. Nineteen cases were received traditionally closed pleural biopsy with Abrams needles and the others were performed the US-guided pleural biopsy with the Abrams and Cope's needles.
Results: Twelve (63.15%), 6 (31.6%), and 1 (5.3%) cases receiving closed pleural biopsy were diagnosed as malignancy, tuberculosis, and uremic pleurisies, respectively. Twenty five (71.4%) and 9 (25.7%) cases receiving US-guided pleural biopsy were diagnosed as malignancy and tuberculosis. No significant difference between the etiologies and the methods of biopsy was demonstrated. There were significant difference between the diagnostic yield of closed pleural biopsy and the US-guided pleural biopsy (8 of 19, 42.1% vs 26 of 35, 74.3%, respectively, p = 0.019). The diagnostic value of US-guided pleural biopsy was 54.6% (6 of 11), 91.7% (11 of 12), and 83.3% (10 of 12) for no pleural abnormality, thickening pleura, and pleural nodules on US image, respectively (p = 0.045). Also, the US-assisted Abrams needle biopsies had a higher diagnostic value than the US-guided Cope's needle biopsies (74.3% vs 42.9%, p = 0.015).
Conclusion: US-guided pleural biopsy with Abrams needle is effective for specific diagnosis of exudative lymphocytic PEs.

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Ultrasound guided transthoracic tru-cut biopsy and FNAC lung: An Indian study

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Introduction: Pulmonary lesions located in close proximity to thoracic wall may be sampled either by tru-cut biopsy or by fine needle aspiration cytology (FNAC) of lung using 18-20 gauge needles under ultrasound guidance.
Aims and objectives: To assess the utility and safety of ultrasound guided transthoracic tru-cut biopsy and FNAC lung in the evaluation of peripherally located pulmonary lesions.
Methods: All patients with peripheral lung lesions who underwent tru-cut biopsy or FNAC of lung under USG guidance between January 2008 and January 2012 in a tertiary care hospital were included in the study. Patients were observed for one hour following the procedure and a chest x-ray was performed after that to look for any pneumothorax.
Results: 57 patients (39 males and 18 females) underwent the above procedure during the period of study. Mean age of patients was 51.3 years (range: 25-79

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years). 42 patients underwent tru-cut biopsy of lung and 15 cases underwent FNAC of lung. Mean tumour sizes were 60.2±29.3 mm. Histological/cytological examination provided the diagnosis in 53 cases: lung cancer – 40, other malignant tumours – 3, benign tumours – 2, granuloma – 6, and organizing pneumonia – 2. Adenocarcinoma (22 cases) was the most common lung cancer detected. In three cases the diagnosis was inconclusive. Complications were observed in five patients: mild haemoptysis which improved spontaneously – 2, subcutaneous emphysema – 1 (improved without any intervention), and pneumothorax in two patients, one of whom required tube thoracostomy.

Conclusions: USG guided tru –cut biopsy/FNAC of lung gives a high diagnostic yield in peripheral lung lesions. Complication rate of the procedure is low.

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