

Right Hilar Mass Diagnosed by Endobronchial Ultrasound Guided Transvascular Needle Aspiration

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ABSTRACT

The Endo Bronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUSTBNA) for diagnosis and staging of benign and malignant thoracic diseases is the standard of care nowadays. The complications associated with it are rare and minor. We report one case of a 47-year-old male, was evaluated by his primary care physician for complaints of cough, chest pain on right side and episodic dyspnea of one month duration. He was a non smoker and chef by occupation. He denied any history of fever, chills, sputum production, wheezing, or haemoptysis. Chest radiograph showed right lower zone mass. Computed tomography (CT) of the chest revealed well defined a 3×4 centimeter tumorous lesion arising from the right middle lobe bronchus. Fiberoptic bronchoscopy was normal. Endobronchial Ultrasound (EBUS) revealed 2.3×3.3 cm hypoechoic lesion at station 12R lying adjacent to a branch of right inferior pulmonary artery. We examined the pulmonary artery segment using color flow Doppler enhancement. It showed no blood flow over the mass. We next deployed the biopsy needle to its full length into the mass, traversing the near and far walls of the pulmonary artery branch in the process. Rapid on site evaluation by a cytopathologist revealed diagnosis of spindle cell neoplasm.

In present case, we did EBUSTBNA of a right hilar mass traversing the pulmonary artery. There was no vascular injury in the current procedure and with the small diameter needle and real-time guidance such procedures can be performed safely.

Keywords: Carcinoid, Complications, Transpulmonary artery, Transvascular puncture

CASE REPORT

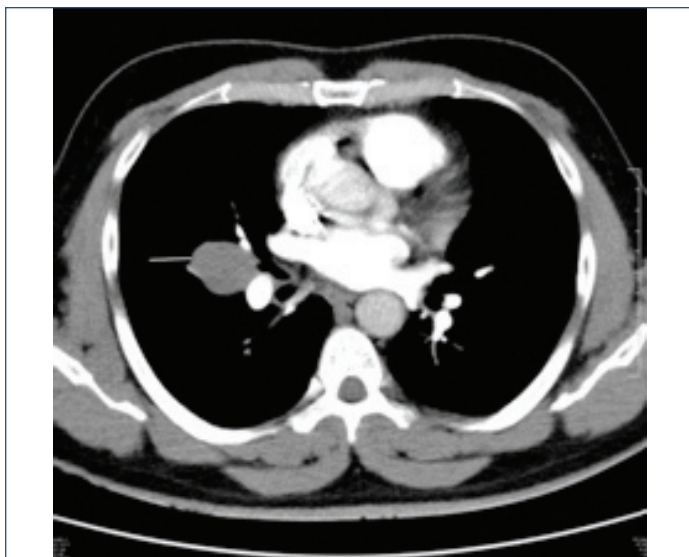
A 47-year-old man presented with productive cough, occasional wheeze on exertion and chest pain on right side of one month duration. He was a non smoker and known case of systemic hypertension and Type 2 diabetes mellitus was on amlodipine 2.5 mg and diet control for the same since one month. On examination, he was comfortable at rest with respiratory rate of 20/minute and systolic blood pressure 130/80 mmHg. His oxygen saturation was 98% breathing room air. There was no clubbing, cyanosis, lymphadenitis, or dilated veins on general examination. Examination of respiratory system was unremarkable. Blood investigations were as following: Hemoglobin (HB) 14.8 gm/dL, Total white blood cell count 8,400/mm³, neutrophil 48%, lymphocytes 41% and eosinophil 7%. Renal function test, liver function test and prothrombin time were within normal limit. A posteroanterior chest radiograph demonstrated right paracardiac opacity [Table/Fig-1].



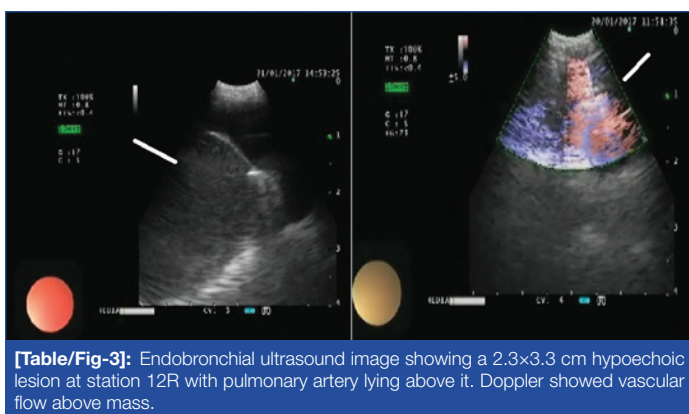
[Table/Fig-1]: Chest radiograph showing solitary pulmonary nodule in right lower zone.

Computerised tomographic pulmonary angiogram revealed a soft tissue lesion with smooth rounded borders measuring 2.6×2.9 cm at the right hilum along the descending pulmonary artery and the right middle lobe bronchus. A small blind ending bronchus was seen arising from the main middle lobe bronchus extending to the lesion with medial and lateral segment branches of middle lobe seen separately. The differential diagnosis of bronchogenic cyst, bronchogenic carcinoma or rare lymphoma were considered. Fiberoptic bronchoscopy was done which showed extrinsic compression on right middle lobe bronchus. [Table/Fig-2]. Following, the patient underwent EBUS. It was done using a bronchoscope equipped with a distal 7.5 MHz linear ultrasound transducer probe and dedicated ultrasound image processor (Olympus model) It showed 2.3×3.3 cm hypoechoic lesion at station 12R with pulmonary artery lying above it. We examined the pulmonary artery segment using color flow Doppler enhancement to demonstrate blood flow. The mass was not showing any blood flow. Next, the needle was deployed into the mass. The needle traversed through the near and far walls of the pulmonary artery branch for the process. Four separate passes were made and minimal bleeding was noted [Table/Fig-3]. The patient tolerated the procedure well. Rapid on-site cytopathologic evaluation confirmed the presence of adequate tissue for evaluation with few suspicious cancerous cells. Cell block was prepared from EBUS aspirate which was processed for Immune Histochemistry (IHC). The IHC came positive for synaptophysin and chromogaphin [Table/Fig-4]. Final diagnosis was spindle cell neuroendocrine neoplasm. Post procedure period was uneventful without any complications. Positron emission tomography was done for staging and it showed FDG avid lesion in middle lobe with Standardised uptake value (SUV) of 6.9. No other lesions were seen and staging was T2N0M0-Stage 1 b. He was referred to cardiothoracic surgeon for right

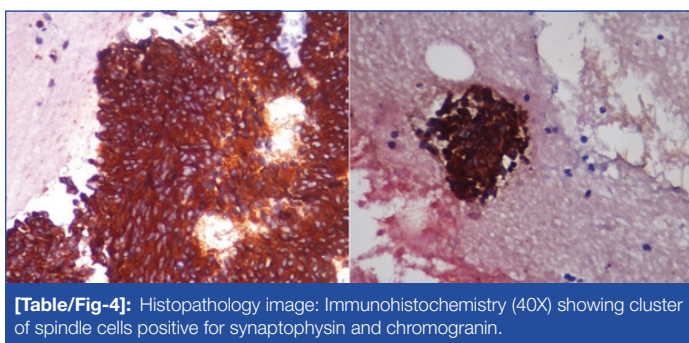
middle lobectomy but due to personal reason he deferred the procedure.



[Table/Fig-2]: Computed tomography image showing a 2.6x2.9 cm well defined soft tissue lesion at the right hilum along the descending pulmonary artery and the middle lobe bronchus.



[Table/Fig-3]: Endobronchial ultrasound image showing a 2.3x3.3 cm hypoechoic lesion at station 12R with pulmonary artery lying above it. Doppler showed vascular flow above mass.



[Table/Fig-4]: Histopathology image: Immunohistochemistry (40X) showing cluster of spindle cells positive for synaptophysin and chromogranin.

DISCUSSION

The EBUS guided transbronchial needle aspiration has rapidly evolved in to the standard of care for diagnosis and staging of benign and malignant thoracic lesions [1]. Use of EBUS allows realtime sampling of lesions. By using doppler, we can also avoid vascular puncture [1]. But accidental vascular punctures happen often with no reported complications. Using convex probe EBUS (CP-EBUS) gives unique ability to show blood flow using the colour Doppler US in addition to the US real time images, helping us to differentiate Lymph Nodes (LN), necrotic areas, and mediastinal cysts from vascular structures [1,2]. To identify various thoracic vessels is an integral part of EBUS procedure. Current staging system uses vascular landmarks to delineate several lymph node stations [3]. In rare cases, the clinician face difficult situation in which a minimally invasive approach to the lymph nodes or mass through vessel is required. We present a case of right middle lobe mass for which the diagnosis was obtained by doing transvascular needle aspiration.

We found only few cases reported on transvascular EBUS guided TBNA and getting successful diagnosis in literature [Table/Fig-5] [4-8]. As shown in [Table/Fig-5] there was no significant bleeding or any other complications reported by various authors after Transvascular Needle Aspiration (TVNA) [4-8]. The reason is that the pulmonary artery is a high flow, low-pressure system, it is possible to traverse its wall with a fine needle of 21 or 22G and it is likely to be immediately sealed upon removal of the needle, if there is no laceration of the vessel. Some authors also suggested that low pressure vessels such as PA bleeding would cease without packing and there is no risk of haematoma or pseudoaneurysm as they are packed between mediastinal structure unlike pleural cavity or open air space.

Authors	No. of cases	Location of target	Diagnosis	Needle	Complications
Vincent B et al., [4]	1	Left hilar mass adjacent to the left inferior pulmonary artery	Carcinoid tumour	EBUS/22G	None
Folch E et al., [5]	4	Station 5 LN	Definitive diagnosis of malignancy in 3 cases, fourth case required thoracoscopy	EBUS/21G	None
Boujaoude Z et al., [6]	2	1. LN in station 11R through right pulmonary artery. 2. Right perihilar lung nodule through right lower branch of pulmonary artery	1. Adenocarcinoma with lung primary 2. Papillary adenocarcinoma of lung	EBUS/21G	None
Panchabhai TS et al., [7]	5	Station 5 lesions through pulmonary artery (n=3) Station 6 lesions through Aorta (n=2)	Three cases diagnosed with malignancy. One biopsy bronchogenic cyst. One biopsy was non-diagnostic	EBUS/21G	None
Folch E et al., [8]	10	Station 5 lesions	Cases got confirmed diagnosis, one showed atypical cells requiring VATS	EBUS/21G	None
Present case	1	Station 12R through right pulmonary artery	Neuroendocrine tumour	EBUS/21G	None

[Table/Fig-5]: Literature review of TVNA cases till date and comparison with present case.

CONCLUSION

In summary, we performed successful diagnostic EBUS-guided TBNA of a hilar mass traversing the pulmonary artery. There was no vascular injury. We believe that as the procedure was done under real time guidance with small diameter needle, there was no complications.

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