Case Report

Endobronchial ultrasound guided needle aspiration of a paraspinal mass with prior failed multiple diagnostic interventions: A case report and literature review

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ABSTRACT

The increasing frequency of tuberculosis (TB) in both developed and developing countries has continued to make spinal TB an important health problem. The present case report is about a patient who presented to us with progressive back pain and paraspinal mass. We performed endobronchial ultrasound guided needle aspiration from the paraspinal mass. The cytology showed granulomatous inflammation suggestive of TB.

KEY WORDS: Endobronchial ultrasound, paraspinal mass, transbronchial needle aspiration

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INTRODUCTION

Spinal involvement occurs in less than 1% of patients with tuberculosis (TB).[1-3] Linear probe endobronchial ultrasound (EBUS), with the ability to perform real-time transbronchial needle aspiration (EBUS-TBNA), has increased the diagnostic possibilities for mediastinal and hilar lymphadenopathy, including lymph nodes metastasis of lung cancer, sarcoidosis, tuberculous lymphadenopathy, and lymphoma. However, there is limited experience on usefulness of EBUS-TBNA in the diagnosis of non-lymph node lesions like tubercular involvement of thoracic spine.

CASE REPORT

This was a case report of a 65-year-old gentleman who was admitted in the neurosurgery ward with gradually progressive back ache for 3 month. He had no history of cough, fever, loss of weight or appetite. Routine blood examinations were normal. Neurological examination, bowel and bladder functions were normal. Systemic examination was normal. Serum protein electrophoresis was normal. Skin test for *Mycobacterium tuberculosis* (Purified Protein Derivative with 5 TU) was negative. Serum Brucella titer was negative and he was seronegative for human immunodeficiency virus. There was no other significant medical illness. He was earlier treated empirically with anti-tuberculosis (TB) medications for 2 weeks, which the patient has stopped prior to coming to us.

Contrast enhanced magnetic resonance imaging (MRI) of dorsal spine showed predominantly enhancing soft-tissue swelling in the pre/para-vertebral and anterior epidural aspect of the spinal canal at T6-T7 level causing thecal sac compression. It extended superiorly up to T4 vertebral level and inferiorly until T8 vertebral level. There was no spinal instability or cord compression requiring any urgent neurosurgical intervention.

Computed tomography (CT) guided fine needle aspiration cytology (FNAC) was done from the posterior approach and cytology showed only degenerated cells and no definite comment could be made by the pathologist. CT guided tru-cut biopsy through the posterior approach to the right side of T7-T8 spine showed fibro adipose tissue, focal lymphoid aggregates, which were partially crushed. There were no definite granulomas or malignant cells. Bone marrow aspirate and bone biopsy of T7-T8 spine did not show granulomas, acid fast bacilli (AFB) or malignant cells. Second CT guided tru-cut biopsy also could not

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Website: www.lungindia.com

DOI: 10.4103/0970-2113.142149

yield a diagnosis.

Subsequently rigid pleuroscopy guided biopsy was done from paravertebral tissue and mediastinal pleura under general anesthesia. The histopathological examination showed sclerainflammatory pathology and mediastinal pleural biopsy showed no definite pathology.

We were consulted when patient complained of acute onset breathlessness in the ward. CT pulmonary angiogram showed filling defects in the subsegmental branches of right and left pulmonary arteries suggestive of acute pulmonary embolism. The proximal extent of the mass was seen up to posterior carinal and subcarinal level [Figure 1]. There was no pulmonary parenchymal abnormality, no adenopathy or pleural effusion. Subsequently, bronchoscopic guided endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA) was planned.

Bronchoscopy was done using the linear EBUS scope (BF-UC 180F; Olympus Medical Systems, Japan) with a compatible endoscopic ultrasound unit (EU-M E1; Olympus Medical Systems, Japan). The patient received nebulized lignocaine (4% solution) immediately before the procedure. Conscious sedation with injection midazolam and fentanyl were used – 2 mg/25 mcg respectively titrated up to 6 mg/150 mcg to achieve a good level of sedation. Topical 10% lignocaine spray was applied in the oropharynx. The procedure was done in the supine position through the oral route. The paraspinal mass was visualized with the EBUS scope placed in the medial wall of right and left main bronchi, seen best with the scope placed in the medial wall of left main bronchus [Figure 2]. TBNA specimens were obtained using a dedicated, disposable, 22-gauge, EBUS needle (NA-201SX-4022 Olympus Medical Systems, Japan), using the jabbing method under real-time ultrasound control. Continuous suction was applied with a dedicated 20 ml syringe (VacLok) while the catheter was moved back and forth for up to a maximum of 10 times. Four passes were made from each side of the carina with the scope placed along the medial wall of right and left main bronchi.

Bedside cytology showed epitheliod cell granulomas suggestive of TB [Figure 3]. AFB stain was negative in the TBNA smear. Cytology of the aspirate showed no malignant cells. Polymerase chain reaction (PCR) of the TBNA aspirate (multiplex PCR, *Mycobacterium*) was positive for *M. tuberculosis* species. Gram stain and culture of the aspirate ruled out pyogenic or fungal infection. Patient was started on isoniazid, rifampicin, ethambutol and pyrazinamide according to World Health Organization (WHO) recommended weight regimen. He was discharged with anti-tubercular medications and vitamin K antagonists for pulmonary embolism. After 1 month of follow-up, he had significant relief of back pain and repeat erythrocyte sedimentation rate was 30 mm/h when compared to earlier value of 105 mm/h, 1 month back. TBNA aspirate culture by *Mycobacterium* growth indicator tube (MGIT, colorimetric based method) was negative for *M. tuberculosis* species. At 3 months follow-up, patient had remarkable clinical improvement with complete subsidence of back pain.

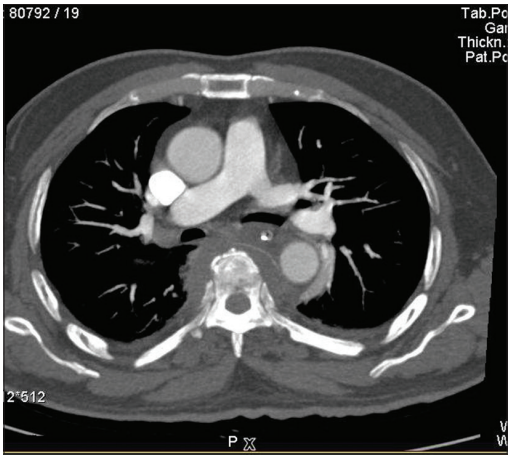

Figure 1: Computed tomography pulmonary angiogram image at level of main carina, showing vertebral body destruction and soft-tissue lesion at D4-D5 level

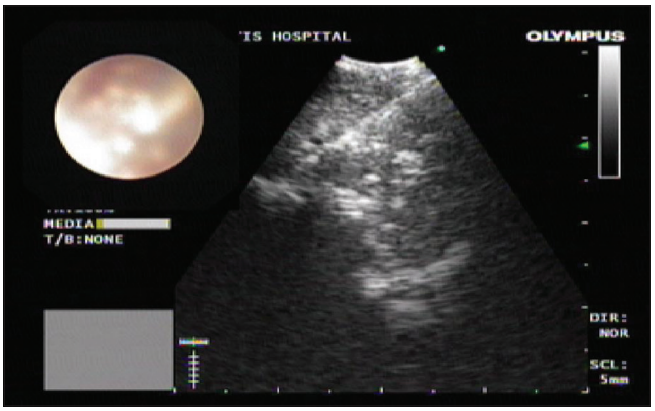

Figure 2: Endobronchial ultrasound image of subcarinal area shows the mass with transbronchial needle aspiration needle in it. The mass appears as homogeneous well-defined round structure, in the upper part of image, with specs of calcification (whitish dots) in it

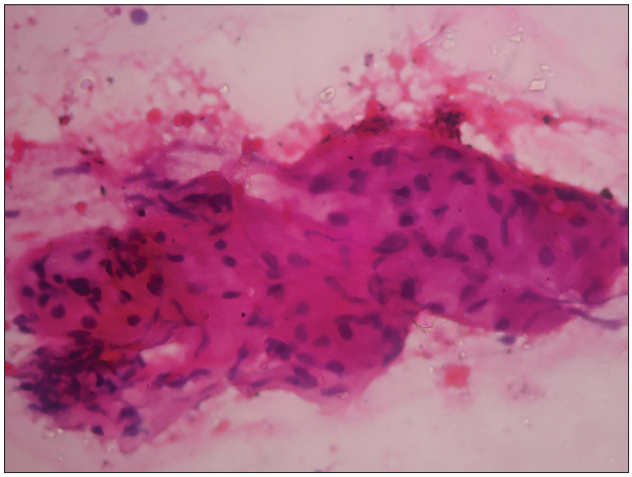

Figure 3: Photomicrograph of transbronchial needle aspiration aspirate showing Epitheliod cell Granulomas (H and E, ×400)

DISCUSSION

The first modern case of spinal TB was described in 1779 by Percival Pott.[4] There are two distinct types of spinal TB, the classic form or spondylodiscitis and an increasingly common atypical form which is spondylitis without disc involvement.[5] The anterior aspect of the vertebral body adjacent to the subchondral plate is commonly involved.[6]

Differential diagnosis of spinal TB includes pyogenic and fungal infections as well as metaststic and primary spinal tumors and it may be difficult when only clinical and radiographic findings are considered.[7] CT provides bony detail while MRI evaluates the involvement of soft-tissue and abscess formation. In comparison to pyogenic discitis, the most distinguishing feature of spinal TB is bony destruction with relative preservation of the intervertebral disc and heterogeneous enhancement. In pyogenic discitis, bone destruction and homogenous enhancement is more frequently observed.[8] The presence of an abscess and bone fragments differentiate spinal TB from neoplasia and if there is any doubt an image-guided biopsy is indicated.[9] In 88.5-96.4% of the cases, a CT guided FNAC biopsy is helpful and yields a diagnosis.[10,11]

Spinal TB is a medical disease and anti-TB drugs have a main role in the recovery and response of patients.[12] Combination of rifampicin, isoniazid, ethambutol and pyrazinamide for 2 months followed by combination of rifampicin and isoniazid for a total period of 6, 9, 12 or 18 months is the most frequent protocol used for treatment of spinal TB.[13] The proposed regimen of WHO with total duration of 6 months consists of primary treatment with isoniazid, rifampicin, pyrazinamide and ethambutol for 2 months followed by 4 months of therapy with isoniazid and rifampicin. American Thoracic Society recommends 9 months of treatment with the same 4 drugs for initial 2 months followed by 7 months of therapy with isoniazid and rifampicin in the continuation phase, whereas the Canadian Thoracic Society recommends a total time of treatment as long as 9-12 months.

CT guided biopsy was attempted twice in this patient, but futile. Possible reasons could be: (1) The bulk of the lesion was pre-vertebral and located anteriorly in the spinal column. (2) The biopsy and FNAC were taken from the posterior spinal column along with the bone biopsy, which was taken from posterior spinal pedicle, and the bulk of lesion was located anteriorly in the spinal column. (3) As the patient was partially treated with anti-TB medication there might have been peripheral healing and aspirates taken from the periphery of the lesion repeatedly showed only degenerated cellular pathology.

Our patient presented with Pott's spine, however no definitive diagnosis could be made with the best available tests, hence we tried aspiration through endobronchial route via bronchoscopy (EBUS). To the best of our knowledge, this is the first reported case from India of EBUS TBNA from Pott's spine in a patient with acute pulmonary embolism.

CONCLUSION

Base on the above report it can be concluded that endobronchial ultrasound guide needle aspiration is a safe procedure for difficult to diagnose pre/para-vertebral soft-tissue lesions, provided the lesion involves D4 vertebral level (at the level of main carina). It can be tried as second choice if CT guided biopsy is negative and there is diagnostic dilemma.

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How to cite this article: Sinha N, Padegal V, Jermely D, Satyanarayana S, Santosh HK. Endobronchial ultrasound guided needle aspiration of a paraspinal mass with prior failed multiple diagnostic interventions: A case report and literature review. Lung India 2014;31:401-3.

Source of Support: Nil, **Conflict of Interest:** None declared.