

Ultrasonography: A Cost- effective Modality for Diagnosis of Rib Tuberculosis --- A Case Report

Naresh Kumar*, Gaurav S Pradhan**

Abstract

Tuberculosis can involve any bone in the body but involvement of rib as such is rare. Here, we present a case of a 15 year old girl who presented with chest wall swelling, altered bowel habits and constitutional symptoms. Tubercular rib abscess associated with abdominal tuberculosis was diagnosed with ultrasound and polymerase chain reaction for mycobacterium tuberculosis on the aspirate taken from the lesion on the chest wall. Patient responded well to antitubercular treatment.

Keywords: Tuberculosis, Rib abscess, Ultrasonography, Abdominal tuberculosis.

Introduction

Tuberculosis of the rib is a rare condition occurring in less than 3% cases of skeletal tuberculosis.¹ Cold abscesses in this area are more commonly secondary to tuberculosis of thoracic spine. Rib tuberculosis is usually diagnosed with chest radiography and CT scan and confirmed by demonstration of tubercular bacteria on microscopy or culture. Here, we present a case of rib tuberculosis associated with abdominal tuberculosis which was diagnosed by ultrasound and TB- PCR for mycobacterium done on aspirate from the swelling.

Case report

A 15 year old girl presented as an outpatient with a swelling on the right side of the chest for one week. On detailed history taking, she gave history of abdominal pain, off and on, for 8 months and mild fever for last six months. She also had history of weight loss, decreased appetite and altered bowel habits. There was no history of cough, expectoration and trauma. On

clinical examination, there was a soft to firm, non tender, swelling over the 6th rib anteriorly in the mid clavicular line. Mild ascites was detected. There was no spinal tenderness. Rest of the systemic examination was unremarkable.

On investigation, her hemoglobin was 8.7 gm/dl, total leukocyte count of 10,290 with differential count of P₆₁L₃₀M₄E₅. Her chest x- ray was normal. Ultrasound of chest showed a fluid collection of 32 mm × 15mm × 31mm with volume of 7.15cc with debris over right 6th rib anteriorly (figure1). Ultrasound of abdomen revealed thickened omentum and ascites (figure 2). Diagnostic ascetic tap was done which showed 850 cells with 90% lymphocytes and 10% neutrophils, protein of 5.8gm/dl, glucose of 90mg/dl and Adenosine deaminase (ADA) of 45.5U/L. Gram stain and ZN stain of the ascetic fluid was negative. FNAC of the rib lesion showed only chronic inflammatory cells, hence was inconclusive. No granuloma or caseation was seen in the FNAC smear. The TB- PCR for mycobacterium tuberculosis was positive in the aspirate from the lesion. Tests for HIV, HBsAg and anti HCV were nonreactive in this patient.

*Department of Medicine, Maulana Azad Medicine College & associated Lok Nayak Hospital, New Delhi, India

**Department of Radiodiagnosis, Maulana Azad Medicine College & associated Lok Nayak Hospital, New Delhi, India

Correspondence to: Dr. Naresh Kumar, Department of Medicine, Maulana Azad Medicine College & associated Lok Nayak Hospital, New Delhi, India. **E- mail:** drnareshmamc@gmail.com

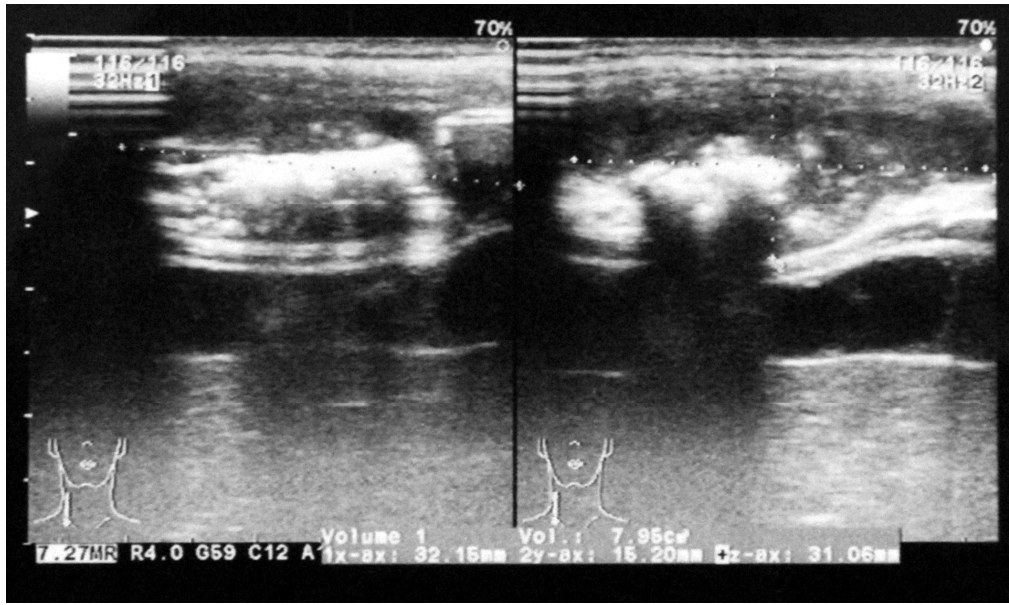


Figure 1. Ultrasound of chest showing rib abscess

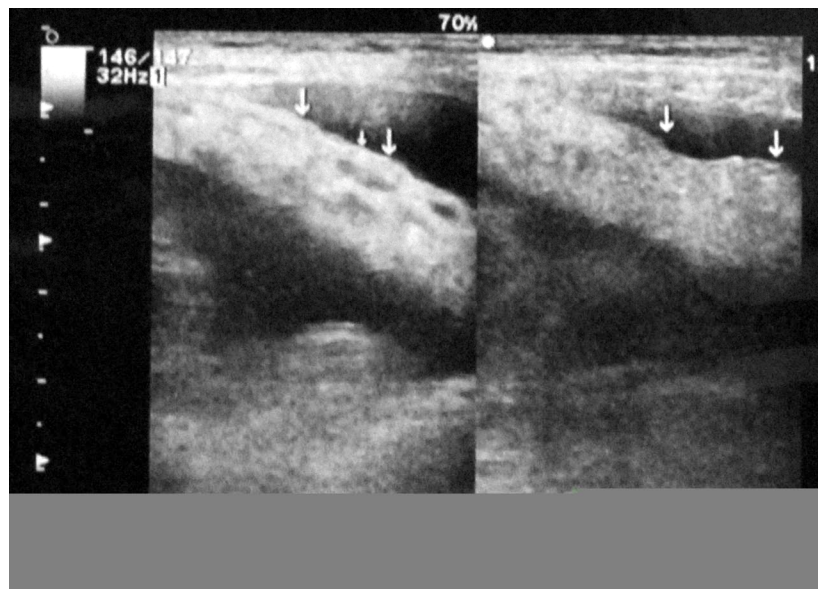


Figure 2. Ultrasonography of abdomen showing omental thickening and free fluid in the abdomen

Patient was started on antitubercular treatment (ATT) including rifampicin, isoniazide, pyrazinamide and ethambutol according to the weight of the patient. She was given 2 months of intensive phase of ATT followed by 4 months of maintenance therapy with only rifampicin and isoniazide. Swelling of rib as well as ascites and bowel habit normalized in two months along with weight gain and improvement in appetite. After four months, patient disclosed that she also had a lump of around 2 cm x 2 cm x 2 cm in the left breast which got resolved slowly over 3

months after starting the ATT. Patient is doing well after one year of follow up.

Discussion

Musculoskeletal tuberculosis is the commonest form of extrapulmonary tuberculosis accounting for 10- 15% of total tuberculosis cases in the developing world.² The common sites of involvement in case of skeletal tuberculosis are spine (50%), hips (15%), knee (5%), foot, elbow, hand and shoulders.^{2, 3} Tuberculosis of rib is an

extremely rare condition which occurs in less than 3% cases of all skeletal tuberculosis. However, it is the commonest inflammatory disorder involving the ribs. Tuberculosis is the second commonest cause of rib destruction next only to metastatic bone disease. Tuberculosis can involve either the costal cartilage (tuberculous chondritis) or the bony part (tuberculous osteitis). Tuberculous chondritis is more common than tuberculous osteitis. Tubercular involvement of rib can occur either by direct extension from contiguous pleuro-pulmonary foci or by hematogenous spread from distant foci or reactivation of latent foci formed during hematogenous dissemination of primary tuberculosis.⁴ Less than 50% of cases of rib tuberculosis have active pulmonary tuberculosis.⁴ In our case, the possible method of spread via hematogenous route is more likely as the adjacent lung did not reveal any pathology and the patient simultaneously had features of tubercular abdominal involvement and probably breast involvement on the opposite side. Bone destruction in tuberculosis results from pressure necrosis by granulation tissue and direct action of the organisms. Patients usually present with pain, swelling or discharging sinus in addition to the constitutional symptoms. Differential diagnosis in such cases include secondary or primary tumor of bone, pyogenic abscess, actinomycosis or trauma.¹

The imaging modalities used in the diagnosis of rib tuberculosis include chest radiography, USG, CT scan and MRI scan. Majority of clinicians use CT chest as the second modality after radiography as it shows the nature and extent of associated soft tissue lesion, intrathoracic lymphadenopathy and bone erosions. USG and MRI are less commonly used in this setting. However, ultrasound is a cost-effective modality to assess rib destruction and associated soft tissue abscess. On USG, abscesses are seen as hypodense area with internal heterogeneity. The diagnosis in our case was made with USG and examination of aspirate obtained on USG guided aspiration. In a series of 12 cases, it has been shown that in all the cases the site of involvement was accessible, and CT and MRI was not required for diagnosis making.⁵ However, CT or MRI may be required in cases where site is inaccessible to USG like subcapsular area. MRI is a radiation free modality with better delineation of soft tissue abnormalities. MRI shows rib involvement as altered bone marrow

signal and enhancing soft tissue abscess. Recently, PET/CT is also being used for diagnosis which shows the lesions as areas of increased FDG uptake in the regions of active granulomatous inflammation and necrotic tissue appears as cold area. Diagnosis of tuberculosis of rib is confirmed by demonstrating the granulomatous reaction on cytology and acid fast bacilli by microscopy or culture. In our case, diagnosis was made by PCR for TB bacteria on FNAC sample obtained from the lesion. Antitubercular treatment is required in every case. Patient may sometimes need surgery for establishing the diagnosis and/or management.

The present case highlights the importance of ultrasonography and TB-PCR in the diagnosis of tuberculosis of ribs.

References

1. Chai W-H, Tsai C-H, Chen C-H. Ribs Tuberculosis Presented with Chest Pain --- A Case Report and Literature Review. *Taiwan Crit. Care Med* 2012; 13: 59-63.
2. Singh SK, Gupta V, Ahmad Z et al. Tubercular osteomyelitis of rib – Case report. *Respiratory Medicine CME* 2009; 2: 128-129.
3. Sharma SK, Mohan A. Extrapulmonary tuberculosis. *Indian J Med Res* 2004; 120: 316-353.
4. Keny SJ. Tuberculosis of rib with cold abscess. *JACM* 2014; 15: 137-8.
5. Grover SB, Jain M, Dumeer S et al. Chest wall tuberculosis - A clinical and imaging experience. *Indian J Radiol Imaging* 2011; 21: 28-33.

© ADR Journals 2014. All Rights Reserved

