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Case Study

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AN INTERESTING CASE OF SECONDARY BONE TUBERCULOSIS MIMICKING BONE METASTASIS

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ABSTRACT

Mycobacterium tuberculosis, is the causative agent of tuberculosis (TB).We present a case of young female presenting with low back pain and shoulder and left side arm pain since 1 year. The case was misdiagnosed as benign fibro osseous lesions of bone initially investigated for Thyroid Carcinoma but on further investigation she was found to have Bone Tuberculosis. Multifocal bone TB which is exceedingly rare in immunocompetent patient. Pain is the main symptom in the bone tuberculosis.

KEYWORDS: Musculoskeletal TB, secondary metastasis, multifocal, immunocompetent, M. tuberculosis.

INTRODUCTION

The clinical presentation with multifocal musculoskeletal tuberculosis may closely mimic that in patients with multiple bone metastasis, which makes the accurate clinical diagnosis challenging.[1]

Mycobacterium tuberculosis, is the causative agent of tuberculosis (TB). According to WHO one-third of the world's population, almost 2 billion people, are infected with M. tuberculosis. TB is a concern even in the developed countries. It usually affects lungs. In addition bones and joints also can be affected. Among these cases, spine are most frequently affected and accounts for almost 50% of diagnosed skeletal TB.[1,2,3]

The incidence of bone tuberculosis is less than 5% of all tuberculosis cases. Furthermore, multifocal bone tuberculosis(MBT) is uncommon. Given that it is frequently confused with a malignant tumour, MBT presents a real challenge in diagnosis.[4,5]

Isolated iliac bone tuberculosis is extremely rare, and it accounts for less than 1% of all skeletal tuberculosis cases. The ribs are involved in only 0.1% of all tuberculosis infections.[6]

Mild pain and swelling of the bone, with slight warmth and tenderness, and overlying boggy swelling of the soft tissues should alert clinicians to the possibility of skeletal tuberculosis.[7]

These cases often present with indolent clinical course, leading to delayed diagnosis with bone and joint destruction. They often mimic multiple myeloma (MM), osteoarthritis, osteomyelitis, or even hyperparathyroidism.[8]

Here, we present a case of young female with multi focal musculoskeletal tuberculosis involving multiple- levels of spine and ribs with primary TB in lung. The case was misdiagnosed as benign fibro osseous lesions of bone with MCTD.

CASE REPORT

A 30 year old female patient presented with complaints of fever on and off since 1 month and associated with vomiting. She was treated with oral and iv antibiotics and antipyretics for the same. She had history of low back ache for 1 year for which she was diagnosed as lumbar spondylosis and left sacroilitis and was treated with iv steroids. Following which pain became tolerable and she was carrying on her regular activities. She had recurrent h/o shoulder and arm pain on the left side during work for almost 1 year. She also carries heavy weight during work on left shoulder. At age of 14 years she had h/o pulomonary TB for which she was treated for 6 months. She had h/o 2 abortions. She has h/o thyroid swelling for which she was consulting endocrinologist.1 year ago she was diagnosed with ruptured thyroid nodule with hemorrhagic transformation. Further she never followed up with endocrinologist.

At admission she had prominent swelling in the front of neck. All the vitals were normal. Initial blood invetigations showed WBC 2,700, Hb-11.7, Platelet-150x10^3. Renal function tests and liver function tests done were normal.TSH-1.9, ESR-37 and repeat ESR-33.HIV, weil-felix,dengue serology, rapid malaria test, covid antibodies, blood c/s,urine c/s,stool c/s done were all negative. ECHO done was normal. Mantoux test showed around 8 mm induration**.** Due to history of recurrent abortions ANA IF was done which was negative. However, ANA Profile done showed-RNP/Sm, Sm—positive 1+. PCNA– Borderline(+). It did not fit into criteria of connective tissue disease. Antiphospholipid antibody was negative. TB quantiferon gold and QBC malaria were negative. Complement C3,C4 and serum ACE levels, serum PTH levels were normal.

Peripheral blood smear showed— Normocytic hypochromic blood picture with leucopenia. CT Thorax plain– showed apical fibrosis in the right upper lobe. Few mildly enlarged pre-paratracheal and subcarinal lymph nodes were noted measuring 7-9 mm. Thoracic cage– Ill-defined lytic lesion are seen in the left 1st, 2nd and 3rd ribs posteriorly. Well-defined lytic lesion is seen along the left pedicle of the T3 vertebral body measuring 11mm and tiny in the spinous process of the T2. Similar lytic lesion is seen along the left pedicle of the T1 vertebral body as well as C6 vertebral body.(Fig 1,2 &3).

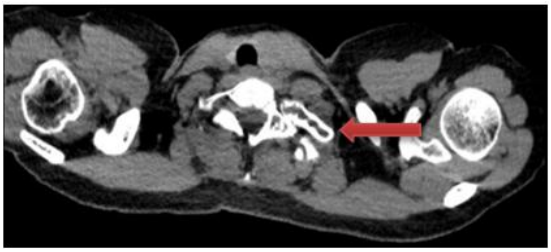

Figure 1: CT thorax showing osteolytic lesions showing vertebrae and rib involvement.

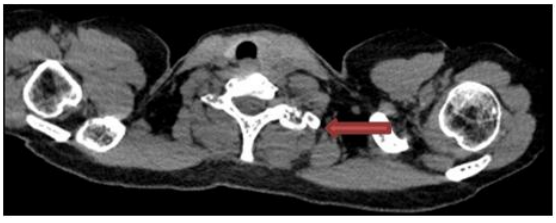

Figure 2: Osteolytic lesions in spine with adjacent rib in CT thorax.

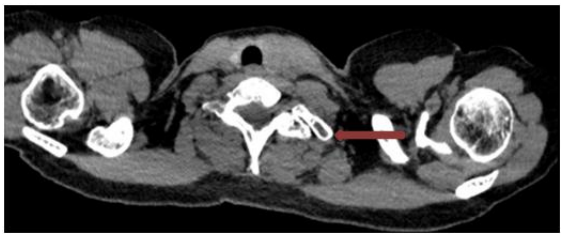

Figure 3: Osteolytic lesions in ribs and vertebrae in CT thorax.

Patient underwent PET scan (Fig 4) in view of multiple lytic lesions which showed? Papillary CA of thyroid with mediastinal lymphadenopathy and lytic lesions in cervical thoracic vertebrae and ribs. Hence initially malignancy with seconadary metastasis was suspected.

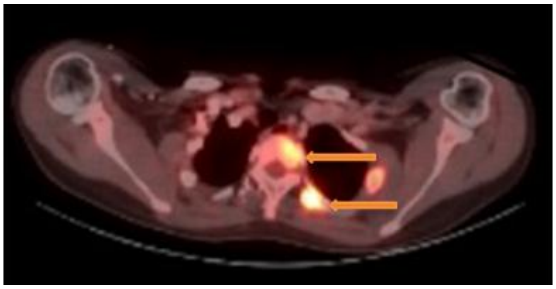

Figure 4: PET CT scan showing lytic lesions.

In vertebrae and ribs

For confirmatory diagnosis FNAC of thyroid was done which showed features of goitre (Bethesda category-II).For further confirmatory test she underwent thyroid trucut biopsy and bone biopsy. Thyroid biopsy showed—Features of colloid goitre with cystic changes. Bone biopsy showed–benign fibro-osseous lesion. For further fever evaluation protein electrophoresis (Fig 5) was done which showed acute inflammation. Bone marrow aspiration done showed triliniage hematopoiesis. Bone marrow biopsy done showed hematopoietic elements of all three lineages. No malignancy/metastasis. Bone marrow culture showed no growth.

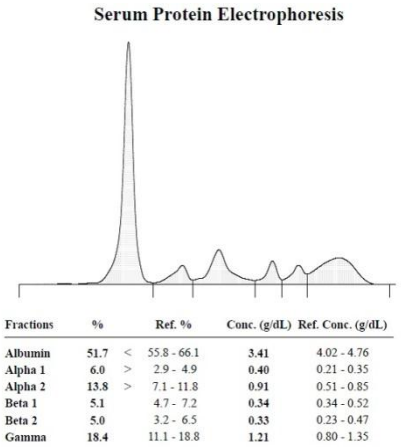

Figure 5: Serum Protein Electrophoresis.

Hence an diagnosis of MCTD and fibrous dysplasia was done and she was discharged on HCQS and steroids.

Patient was asymptomatic for few weeks but later presented to the hospital with severe pain in the left side of upper chest and ribs with difficulty in movement of left upper limb.ESR-35,CRP-2.78, LDH-152, uric acid-4.4.All other investigations were normal. Bone scan was done due to persistent pain which showed bone fibrocystic lesions. Repeat CT done showed- Normal lung parenchyma with interval resolution of mediastinal lymphadenopathy and persistent lytic lesions. Later

patient underwent EBUS. BAL fluid showed total cell count of 120, 10% lymphocytes, 80% macrophages,10% epithelial cells. There was no AFB or fungal elements, gram stain showed- inflammatory cells 1+,few gram positive cocci in pairs. Cytology was negative for granulomas or malignancy. BAL culture and sensitivity showed no growth. However, BAL Gene x-pert showed-mycobacterium complex.

Hence, final diagnosis of pulmonary tuberculosis with secondary bone involvement was made and patient was started on antitubercular drugs with combination with R-cinex 300/600mg, combutol 1.2 gram along with pyrazinamide 1.5gm. She was also given Alendronate 70mg once weekly for 3 weeks. At follow up after 2 months patient pain reduced and is feeling symptomatically better. Repeat chest x-ray done was normal.(Fig 6).

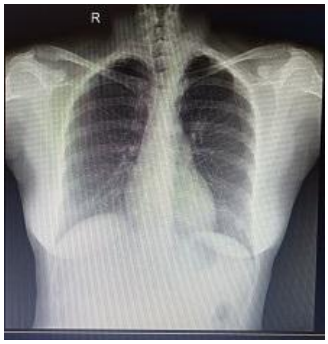

Figure 6: Repeat chest x ray showing normal lung parenchyma.

DISCUSSION

Although tuberculosis has drawn great attention, it is still a major worldwide health burden. The incidence of musculoskeletal TB appears to be increasing. In spite of availability of diagnostic modalities, surgical techniques and effective anti-tuberculosis regimes, musculoskeletal tuberculosis (especially spinal tuberculosis) remains a life-threatening disease that can cause bone destruction, deformity and neurological defects.[1]

The multifocal bone involvement occurs at two or more locations in the skeletal system, which is uncommon even in endemic areas. According to Elghoul et al. case study of a 81 year old male showed involvement of both shoulder joints. At 6 weeks, the polymerase chain reaction (PCR) on obtained bone tissue biopsies revealed M.tuberculosis. Another case study done was that of 38 year old female, with congenital malformation of the pelvis suffered from chronic pain at the left iliac fossa. The pelvic x-ray revealed multiple lytic lesion in left iliac bone.[4]

In the case of spinal tuberculosis, two or more contiguous vertebrae are usually involved due to hematogenous spread of bacteria since one vertebral artery feeds two adjacent vertebrae. According to reported data, the incidence of multiple-level non-contiguous vertebral tuberculosis is 1.1% to 16% of all skeletal TB cases.[1]

An immunocompromised host is predisposed to multifocal bone TB which is exceedingly rare in immunocompetent patient as was seen in our case. Bone TB has been reported in patients who had primary childhood TB as the disease spreads to the developing epiphysis and vertebral bodies. Bone TB generally begins in the cancellous part and produces either a more common perforating type or a progressive infiltrating type lesion. Primary skeletal TB is a rare condition with dismal prognosis if not treated properly or promptly.[5]

The alternative pathway for isolated bone involvement of TB infection of bone may come from trauma.[9]

Pain is the main symptom in the bone tuberculosis. Fever and systemic symptoms may not be present until late stages of musculoskeletal tuberculosis. Thus, pain may persist long before a definite diagnosis. So, clinicians should keep in mind the possibility of musculoskeletal tuberculosis when patients present with long-term musculoskeletal pain even without fever or any other symptoms.[1]

Bone or soft tissue biopsy may be very important to make a definitive diagnosis. However, we should bear in mind that because of low bacterial load in musculoskeletal tuberculosis, the possibility of detecting Mycobacterium may be less than 50%. Multiple biopsies should be performed.[1]

In case reports by Wiratnaya et al. the first case was that of female, 27 year old, with suspected Giant cell tumor (GCT) of right wrist. The patient presented with pain and lump on her right wrist. Biopsy culture grew M.tuberculosis. Another case of 44 year old male patient presented with suspected malignant tumor of right wrist. The patient complained about a lump on his right wrist for 1 year. Biopsy showed granulomatous osteomyelitis and the culture eventually grew M.tuberculosis.[9]

PCR has been recently suggested as an accurate diagnostic tool since both sensitivity and specificity are high, especially for specimens from sterile area. Increasing CRP and ESR serum levels were reported as potential tuberculosis markers in patients with (-) sputum AFB. CRP was especially emphasized to be a good marker for indicating response to the anti-tuberculosis treatment. In the case which presented to our hospital both CRP and ESR were low and made diagnosis difficult. Although the specificity of CRP and ESR are low to diagnose tuberculosis, we should emphasize their diagnostic value.[1]

Imaging examination is not sensitive for differentiating multiple bone metastasis from multiple musculoskeletal tuberculosis. MRI is more sensitive for the diagnosis of musculoskeletal tuberculosis. However, when the

tuberculosis involves multiple, non-contiguous vertebrae, the imaging appearance can be easily misjudged as metastatic malignancy.[1]

Two distinct patterns of spinal TB can be identified from CT and MRI findings: the first (typical) pattern involves intervertebral disc and adjacent vertebral bodies, the second (atypical) pattern is characterized by involvement of the body or neural arch of one or more vertebrae with sparing of intervertebral disc. In a case report by Thawani et al. a 19 year old African-american male was admitted to the hospital with history of progressive worsening back pain, weight loss, fatigue and anorexia. MRI of spine showed destructive lesions involving the body of C5,T6 (right pedicle), T8 (left pedicle) and adjoining posterior ribs, L5, S1,S2, and left iliac bone. Intervertebral discs spared. CT guided biopsy was done and final culture report grew M.tuberculosis.[6] Our case report shows rare case of multifocal spinal and extraspinal involvement in a non immunocompromised patient. Therefore, this case emphasizes the importance of keeping the diagnosis of TB in mind as it can present in multiple unusual sites.

The gold standard is culture of M. tuberculosis from bone tissue. The main stay of treatment is anti-TB drug therapy, and, in the advanced lesions with permanent restriction of joint movements, surgical joint fusion or replacement may be indicated. The early treatment with anti-TB drugs may achieve near complete resolution and preservation of function. At least 12 months of therapy is recommended for bone and joint tuberculosis. But, still, the optimal duration for the treatment remains a subject of considerable debate.[9]

CONCLUSION

Atypical presentations of multiple musculoskeletal tuberculosis pose diagnostic challenge.[1] Tuberculosis of the bone should become one of the differential diagnoses, especially in countries where TB is endemic, even without the involvement of pulmonary system and the presence of constitutional symptoms of TB.[9]

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