Tuberculous Osteomyelitis – A Case Series

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Citation

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Abstract

Tuberculosis is a major health issue in developing countries and can affect any bone of the body. The incidence of Tuberculous osteomyelitis in children is uncommon, and characteristics are different from those in adults. These lesions usually involve the metaphysis and can cross the physis of long bone. The clinical findings are not specific and the only early symptoms are swelling and pain in the involved limbs. Therefore, it is often neglected or the diagnosis is delayed. From our series, we report that diagnosis of Tuberculous osteomyelitis requires a high index of clinical suspicion. Surgery is a valuable adjunct in establishing the diagnosis by histopatholigcal analysis and in evacuation of an abscess or debridement of necrotic bone.

INTRODUCTION

Tuberculosis is a major health issue in developing countries such as India. It can affect any bone of the body1. The incidence of Tuberculous osteomyelitis in children is uncommon, and characteristics are different from those in adults6. These lesions usually involve the metaphysis and can cross the physis of long bone4,5,7,10. The clinical findings are not specific and the only early symptoms are swelling and pain in the involved limbs2,3. Therefore, it is often neglected or the diagnosis is delayed. Isolated involvement of bone by tuberculous infection is uncommon, and the variable clinical and radiological findings may mimic chronic pyogenic osteomyelitis, Brodie`s abscess, bone cysts or granulomatous lesions.

In early stages plain radiographs are normal, but MRI & CT may help to localise the lesions 12. Fine needle aspiration cytology and Biopsy are mandatory to confirm the diagnosis. When operative findings at biopsy have the features of skeletal tuberculosis, surgical debridement and curettage is indicated for cases with diffuse distruction8,9,11,13. In patients with Tuberculous osteomyelitis even after surgical curettage, the growth plate usually maintains the growth potential and heals gradually.

We have reviewed our experience in the hope of stimulating a high index of suspicion for early diagnosis and treatment.

MATERIALS AND METHODS

Between May 2011 and May 2013 a total of 6 patients younger than 18 years of age with Tuberculous osteomyelitis of the long bone with physeal involvement were diagnosed and treated at Mamata General and Super Speciality Hospital. There were 4 boys and 2 girls. All the children were given Bacillus Calmette-Guerin (BCG) vaccine during infancy. The most often noted clinical features were pain, swelling, tenderness, and inability to use the limb. The involved sites were three cases of distal end radius, two cases of proximal humerus, one case of proximal ulna. The duration of symptoms before treatment ranged from 2 weeks to 4 months. All the children in our series had constitutional symptoms of evening raise of temperature, loss of appetite and loss of weight. All the patients had induration more than 15mm on Mantoux test and elevated ESR levels. The chest radiograph and sputum culture for tuberculosis were negative. None of them had discharging sinus. Differential diagnosis on imaging was Brodie`s abscess, Aneurysmal bone cyst, Chronic pyogenous osteomyelitis. Diagnosis was confirmed by biopsy in our case series that showed epithelioid granulomas with multinucleated giant cells and extensive areas of necrosis.

Diagnosing tuberculous osteomyelitis in these children, who did not have evident pulmonary focus was challenging. Although positive mantoux test and raised ESR were suspicious, we confirmed the diagnosis by biopsy and have planned debridement and curettage in all the cases. In one case of proximal ulna, the diagnosis was confirmed pre-operatively by positive AFB culture and the patient was started on anti tubercular drugs. After two cultures came negative within 6 weeks apart of starting anti tubercular treatment, the child was posted for surgical debridement and

curettage along with homologous bone grafting from maternal iliac crest with bone cement as the lesion was large. Intraoperatively after curettage, injection streptomycin was instilled at the debrided site. The curetted material was sent for tuberculosis culture and Histo-Pathological examination. The diagnosis was confirmed by positive Acid –Fast Bacilus (AFB) smears, granulomatous inflammation with or without caseous necrosis in biopsy specimens and isolation of mycobacterium tuberculosis bacilli on cultures. Anti-tuberculous drugs were administered for atleast 6 months in the diagnosed group.

All the cases were followed up prospectively at regular intervals of 1st month, 2nd month,3rd month, 6th month,12th month and 18th month. Radiological and Clinico-functional outcome in terms of limb pain, range of motion of the adjacent joint, and disability in daily activities was assessed at follow up. The final radiograph and functional results were analysed.

RESULTS

Six patients were followed up to 18months for both radiological and clinic-functional outcome. Most of the lesions were osteolytic, round to oval in shape, and showed marginal sclerosis. The periosteal reaction was nil in 4 cases and minimal in two of them.

The diagnosis was confirmed by histopathological examination (Fig 3) and positive growth of mycobacterium on cultures. Antituberculous treatment was started after the diagnosis was established. None of them needed a second debridement.

Of the six cases , four were boys and two were girls. The duration of symptoms before treatment ranged from 2 weeks to 4 months (table 1). All patients were relieved of pain within 3 weeks of initiation of antitubercular treatment. In all the patients ESR returned to normal within 3 weeks of beginning of treatment. During healing we noticed increased radio-density in all the cases. By the end of treatment, all the patients had gained full range of painless movements of the adjacent joints. Good remodelling of skeletal lesions were noted. (Fig 1 & 2)

Table 1

Case no	Age in years	Sex M/F	Duration of symptoms	Location	Pulmonary TB Y/N	HPE conformation Y/N	AFB culture conformation Y/N	Mantoux test P/N	Treatment
1	4	M	2 weeks	D/E radius	N	Y	Y	P	Debridement + Curettage ATT
2	8	F	1 month	P/E humerus	N	Y	Y	P	Debridement + Curettage ATT
3	3	M	3 weeks	P/E humerus	N	Y	Y	P	Debridement + Curettage ATT
4	13	M	2 months	D/E radius	N	Y	Y	P	Debridement + Curettage ATT
5	10	M	3 weeks	D/E radius	N	Y	Y	P	Debridement + Curettage ATT
6	13	F	2 months	P/E ulna	N	Y	Y	P	Debridement + Curettage + Homologous Maternal Bone graft with Bone cement ATT

D/E-Distal end; P/E-Proximal end; Y-Yes; N-No; P-Positive;

Chart 1

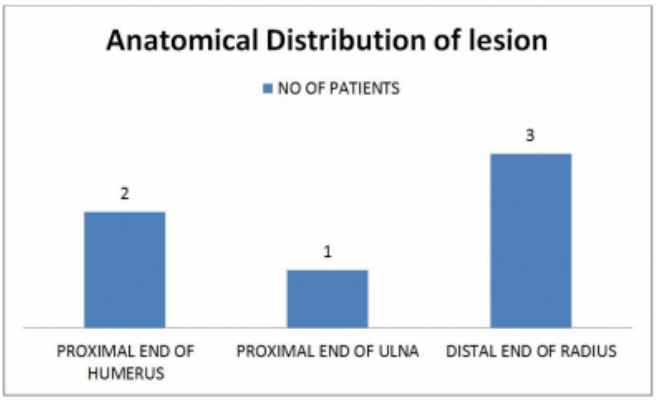

Figure 1

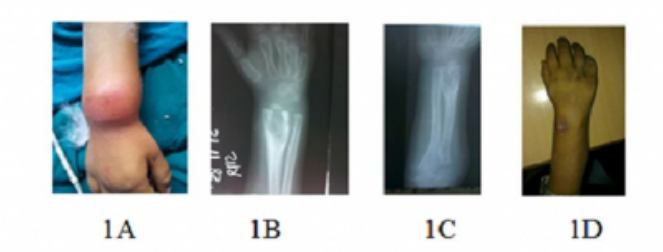

Figure 1: 1a – Pre-op picture; 1b – Pre-op x-ray; 1c – Post-op x-ray; 1d – Post-op clinical picture.

Figure 2

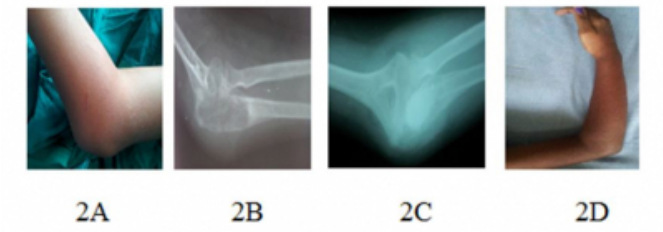

Figure 2: 2a-Pre-op picture; 2b- Pre-op x-ray; 2c-Post-op x-ray; 2d- Post-op clinical picture.

Figure 3

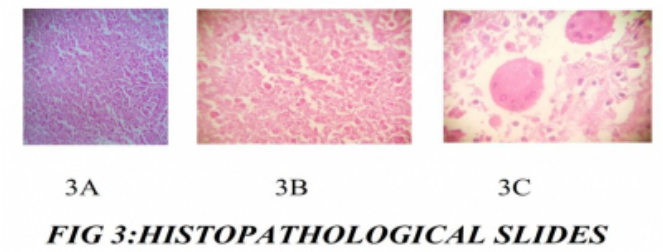

FIG 3:HISTOPATHOLOGICAL SLIDES

DISCUSSION

Any part of the skeleton may be involved but the sites most commonly affected are spine, femur, tibia, humerus and fibula. Incidence of lesion in proximal ulna is relatively rare in literature review. As compared with pyogenic osteomyelitis, tuberculosis of the bones in infants and children tends to occur in the vascularised metaphyses where it produces an endarteritis. The factors that influence localization of skeletal tuberculosis to a specific bone are unidentified. As in other forms of extrapulmonary tuberculosis, the respiratory tract is the primary portal of entry of mycobacteria. Tuberculous osteomyelitis is thought to occur secondary to lymphohematogenous dissemination to the bone at the time of initial pulmonary infection, with local reactivation at a later date.

Our aim was to draw attention to Tuberculous osteomyelitis which is rare compared with skeletal tuberculosis involving spine or joints. The low index of suspicion for diagnosis due to its rarity and the subtle nature of the symptoms in early lesions leads to neglection. The diagnosis is delayed until the process is advanced and destruction has been carried out. The repeated use of NSAIDs in such neglected cases of early lesion creates a false sense of security, until it become apparent that their continued use had failed to provide complete relief.

Mild pain and swelling of bone, with slight warmth and tenderness, and overlying swelling of soft tissue should alert clinicians to the possibility of skeletal tuberculosis. Enlargement of regional lymph nodes and the presence of an abscess is also of great diagnostic significance clinically.

Normal plain radiographs in cases of suspicion require more sensitive investigations such as Montaux test, MRI and CT scan to detect and localise the lesion. Biopsy is mandatory to confirm the diagnosis. Antituberculous drugs remain the mainstay of treatment and in our experience, judicious surgical intervention (debridement and curettage) help to promote early healing. Bone grafting can be considered in treating larger healed bony defects after tuberculous culture reports were negative.

CONCLUSION

From our series we report that diagnosis of Tuberculous osteomyelitis requires a high index of clinical suspicion. Markers of acute inflammation/infection such as ESR and C-reactive proteins are usually elevated, but are nonspecific. Radiographic appearances of TB osteomyelitis depend on the stage of presentation at diagnosis, ranging from mild soft tissue swelling to areas of osteolysis with local osteopenia. Similar radiological findings may be seen in many other conditions. Histopathological evaluation and culturing the organism is the mainstay of diagnosis. Antituberculous chemotherapy is the cornerstone of the management of skeletal tuberculosis. Surgery is a valuable adjunct in establishing the diagnosis by histopatholigcal analysis and in evacuation of an abscess or debridement of necrotic bone.

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