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Pediatric Tuberculosis Osteomyelitis on Proximal Tibia: A Case Report

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ABSTRACT

Background: Tuberculosis of the bone is a serious problem in developing countries, extra-pulmonary tuberculosis is more common among children. The characteristics of tuberculosis osteomyelitis in children are different. Therefore, the disease is often neglected or diagnosis is delayed.
Case Report: A 18-months-old female patients presented with history of pain and mass on right leg and also unable to bear weight. On Physical examination there was palpable fluctuant mass around proximal right leg. Histology examination revealed tuberculous granuloma. Patient treated with surgical drainage and anti-tuberculous drug for 12 months resulted satisfactory outcome in 6 months treatment.
Conclusion: High suspicion for tuberculosis is required in children with musculoskeletal complaints of swelling and stiffness. Tuberculosis osteomyelitis can mimic other lesion but with prompt diagnosis and treatment the outcome was satisfactory.

Keywords: Tuberculosis; osteomyelitis; tibia

INTRODUCTION

Tuberculosis of the bones and joints is a rare granulomatous infection caused by Mycobacterium tuberculosis. Tuberculosis of the bone is a serious problem in developing countries, extra-pulmonary tuberculosis is more common among children. Tuberculosis infection can affect any bone in the body. The spine is the most frequent site of involvement, followed by the hip and knee region. The characteristics of tuberculosis osteomyelitis in children are different. Therefore, the disease is often neglected or diagnosis is delayed.[1] It requires holistic assessment and appropriate treatment

According to the 2020 World Health Organization report, 10.0 million (range, 8.9–11.0 million) people fell ill with TB, equivalent to 130 cases (range, 116–143) per 100 000 population.[2] The rate of extrapulmonary TB (EPTB) worldwide has reached 20%–40% (20% in children), as reported in recent studies. Young patients, females, and people of African or Asian origin seem to have a higher risk of developing EPTB.[3]

This case report provides successful outcome obtained by patient treated with TB medication and surgery treatment.

CASE PRESENTATION

A 18-months-old female patients brought by her parents to emergency department complained about their daughter unable to stand up and bear weight since 12 hours prior to admission. Patient was also complained about pain on her right leg since a day before. The child was previously healthy with normal birth and developmental history. All her vaccinations, including BCG, were done. Patient was referred from other hospital by a General Surgeon diagnosed with susp abscess on right tibia.

The local examination on right leg region revealed swelling on proximal part, the skin

was felt warmth. There was mass 2cm in diameter on anterolateral part of leg with tenderness and fluctuation, active ROM Knee was limited due to pain. Patient underwent x-ray of right and left leg, blood examination, and immobilization with backslab for resting the leg. From AP and Lateral X-ray there was lucent lesion 1,8x1 cm on metaphyseal area of right tibia with soft tissue swelling around the right knee until proximal part of leg. From blood examination the WBC wasn't elevated (12,69 $x10^3/\mu L$), ESR was as high as 34,7 mm/hour, but CRP was normal (1,43 mg/L).

Figure 1. Clinical Picture of Patient's Legs

Figure 2. Right and Left Leg X-Ray AP/Lateral View

A provisional diagnosis of TB osteomyelitis with different diagnosis of bone tumor was made and the child was subsequently taken for excision and biopsy operation. Intra-operatively a thick-walled abscess tissues on the lateral aspect of the right proximal tibia were found and microscopy, culture, sensitivity, and biopsies were taken for histopathological evaluation and post-operative radiograph was taken. Histopathology result granulomas tissues with multinucleated giant cells, necrotic area, and no cancer cells. Post-operatively the child recovered well and was discharged on anti-TB drugs for another 10 months. Patient routinely take tuberculosis medication and wound care. Clinical and radiological improvement was obtained. Radiographs at the six-month showed soft callus and the patient could walk normally without any complaints.

Figure 3. Clinical picture durante operation

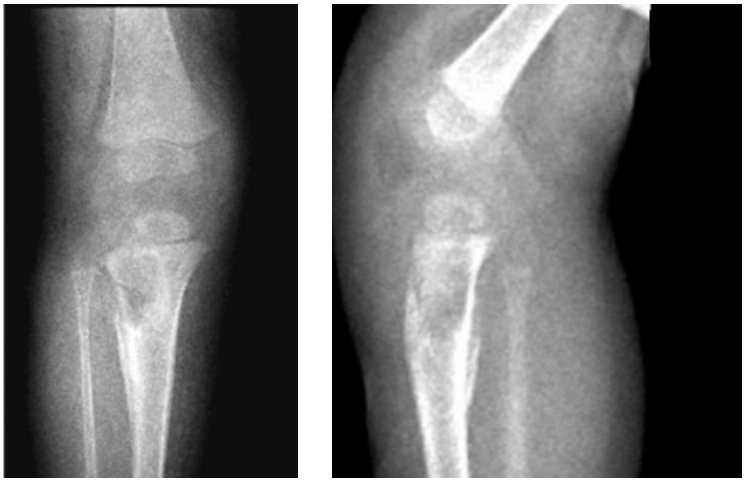

Figure 4. Right knee x-ray AP/lateral view post operation

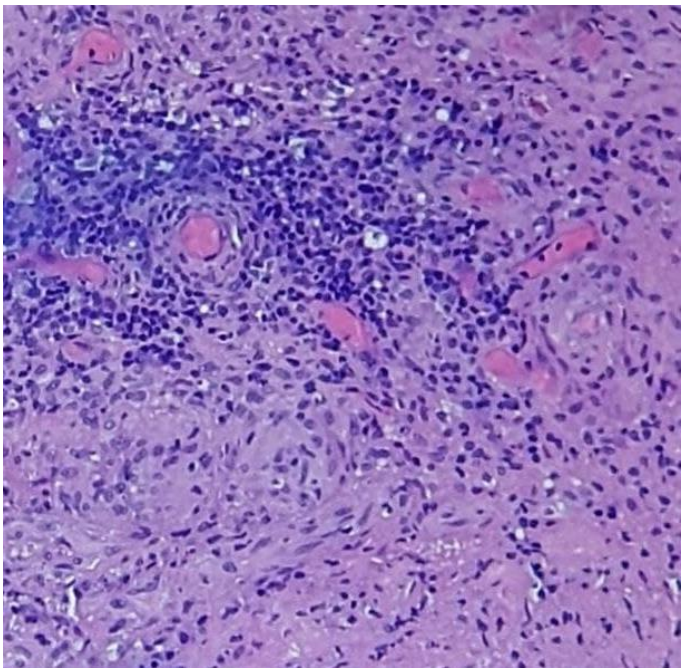

Figure 5. Histopathology result. Granulomas tissues with multinucleated giant cells

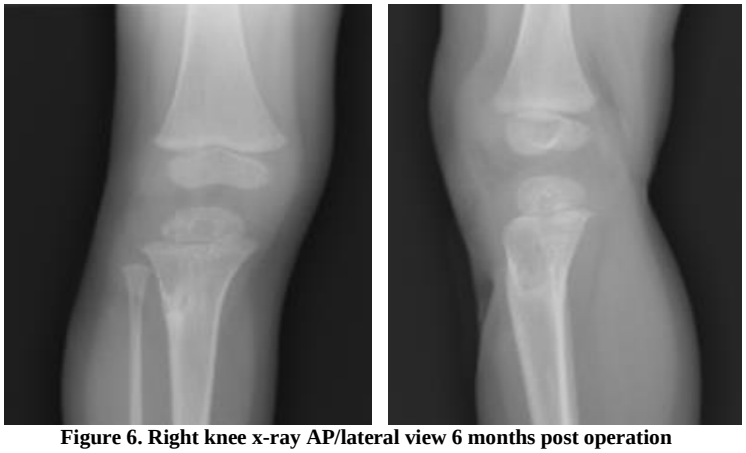

Figure 6. Right knee x-ray AP/lateral view 6 months post operation

DISCUSSION

Tuberculosis remains a major cause of skeletal infection in developing countries, and extra-pulmonary tuberculosis is more common among children. The Bacillus-Calmette-Guerin vaccination itself may also cause tuberculosis osteomyelitis.[4] The origin of the infection is sometimes unclear, as seen in the current study. The characteristics of tuberculosis osteomyelitis in children are different from those in adults. The clinical findings are not specific. The only early symptoms are pain and swelling of the involved site. Therefore, the disease is often neglected, or diagnosis is delayed.[1]

Tuberculous osteomyelitis is characterized by destruction of bone, with little or no tendency for new bone formation. The tuberculous bone focus spreads centrifugally with increasing destruction of surrounding bone until finally the joint is breached.[5] TB bacilli reach the proximal tibia by hematogenic spread resulting in a metaphyseal focus. In children younger than one-and-a-half years further spread to the epiphysis occurs through the patent transphyseal vessels from this metaphyseal focus.[6]

In our case the diagnosis of TB osteomyelitis was made after 2 weeks after the first admission. Teklali et al. reported an average delay in diagnosis of 10 months (range, 10 days to 6 years) indicating the difficulty to make a prompt diagnosis.[7] Other study by Akgul et al., presented diagnosis of tuberculosis osteomyelitis may be delayed up to 6.6–10 months.[8]

The nearest differential was Brodie's abscess, but it was not typical as no sclerosis of the cavity was seen and the child continued to have progressive changes clinical and radiological. Brodie's abscess presents in early childhood and it's relatively indolent and radiologically it does not progress rapidly. Its slow clinical course is similar to the course of patients with tuberculosis, thus, they are often mixed.[9] From the first x-ray of radiological appearance was well demarcated geographic lesion with sclerotic margins, narrow transitional zone on the metaphyseal and proximal epiphysis of the right tibial bone, no visible periosteal reactions and cortical destruction. From histopathology result there was granulomas tissues with multinucleated giant cells and necrotic area. TB osteomyelitis diagnosis was made from clinically and histopathologically.

The current treatment of skeletal tuberculosis in children includes curettage without bone grafting and anti-tuberculosis drugs. The response to this combined treatment is usually significant radiological improvement may occur as early as a few months. Patient weight was 9,9 kg got treated with Fixed Dose Combination (FDC) for children planned for 12 months in total treatment, 2 months for intensive phase and another 10 months for advance phase. After 6 months treatment the patient could walk without any complaints. Other study by Erol *et al* treated 8 children with

combined of surgical debridement and antituberculosis therapy achieved pain relief within 3 months of the initiation of treatment and returned to normal function within 9 months.[4] The authors concluded that resolution and remodeling of bone lesions were satisfactory, with early diagnosis, surgical drainage and prompt TB treatment.

CONCLUSION

High suspicion for tuberculosis is required in children with musculoskeletal complaints of swelling and stiffness. Tuberculosis osteomyelitis can mimic other lesion but with prompt diagnosis and treatment the outcome was satisfactory.

Declaration by Authors

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