Case Report

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Epiphyseal tuberculous osteomyelitis in a child: a case report

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ABSTRACT

Tuberculosis (TB) still rates among the most important infectious diseases in the world, especially in developing countries. Skeletal TB manifests mainly as spondylitis, arthritis, and less frequently, as osteomyelitis. TB osteomyelitis usually develops in the metaphyses of long bones. It is rare for TB to affect the epiphysis directly, without involving the metaphysis. Epiphseal lesions due to TB are lytic in formation.

A 7-year-old child presented with epiphyseal tuberculous osteomyelitis which had affected the medial condyle of his right femur substantially. He underwent debridement, curettage, and grafting. He also received a 1-year-long antituberculous therapy. Complete cure, with no sequelae, was obtained at the end of the therapy. We conclude that tuberculosis must be in the first-hand list of pathological conditions in the differentail diagnosis of lytic lesions encountered at the knees of children.

KEY WORDS: Tuberculosis; Osteomyelitis; Epiphyses; Child

INTRODUCTION

TB is still a common disease worldwide, but it especially stands out among the most important infectious diseases in developing countries. The incidence of TB is on an increase in both the developing and developed countries of the world. In 2014 alone, a total of 9.6 million people, including 1.0 million children, were diagnosed with TB. 1.15 million of these people were HIV positive cases [1]. Children are at a greater risk than adults, due to the tendency of developing extrapulmonary TB [2,3]. The diagnosis of skeletal TB in children is a rather difficult task. The disease manifests as spondylitis, arthritis, or osteomyelitis, in children [4,5]. The metaphyses are the usual sites of disease settlement in the long bones of children [4,6-9]. It is very rare for TB to give rise to a lesion in the epiphysis, and in this case it may resemble benign tumors and other granulomatous infections [4,10-12].

This case report presents and discusses a pediatric tuberculosis patient who had large lytic lesions in the distal epiphyis of the femur, with close connection with the joint. The purpose of this case presentation is to evaluate thoroughly, the radiologic findings, diagnosis, and therapy, of tuberculosis of the long bones and joints, under the light of the knowledge from the literature.

CASE REPORT

A 7-year-old boy was brought to the Orthopedics outpatients with the complaint of a right knee pain which had been persistent for the last three months. The family indicated that the boy had developed a limp due to the pain, and that he also woke up during the night due to the pain. Neither the boy nor the family gave a history of trauma. The vaccination schedule of the patient proved appropriate for his age.

At physical examination, no clearly visible deformities could be detected at the patient's extremities. At palpation, severe pain was present at the medial and posteromedial aspects of the right knee; but there was no swelling, heat increase, or joint effusion. Orthogonal direct X-rays of the knee revealed lytic lesions with sclerotic septations, at the medial condyle of the distal femur [Figure 1]. Computed tomography (CT) revealed the presence of lytic lesions at the medial condyle [Figure 2]. The lesions were abutting the articular surface, and their total diameter was measured as 4 cm. The PA-chest radiogram and whole body bone scintigraphy examinations were reported as normal. The white cell blood count was also normal. There was slight anemia and a slight increase in the erythrocyte sedimentation rate (42 mm/hr). The C-reactive protein was within normal ranges, and the tuberculin test was negative.

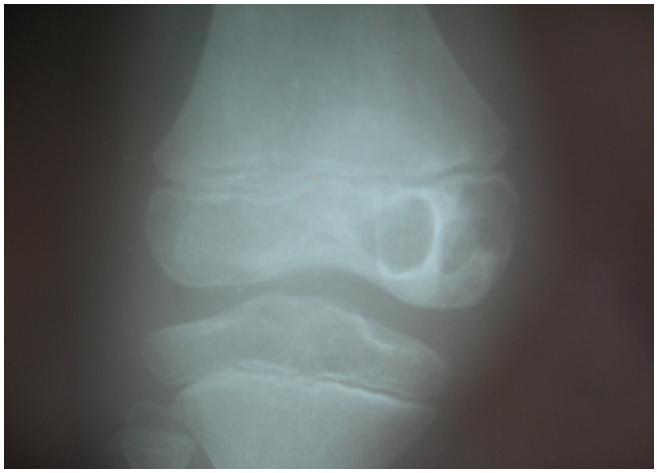

Figure 1. AP view of the right knee. Lytic lesions with sclerotic septations are seen at the medial aspect of the distal femoral epiphysis.

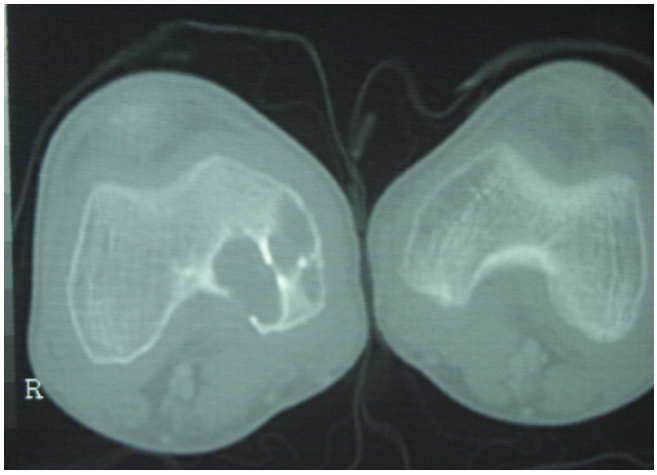

Figure 2. CT clearly shows the relation of the lytic lesions at the distal epiphsis of the right femur with the articular surface.

Informed consent form was obtained from the parents. The patient was operated, and debridement and curettage of the lesions were performed, through an opening established over the medial condyle of the right femur. A somewhat dirty and reddish tissue was debrided [Figures 3, 4]. It was noted that the lesion was destroying the joint cartilage at a 1 cm-wide site at the posterolateral aspect of the medial epicondyle and was also in touch with the joint itself. At the beginning of the operation, cancellous grafts obtained from the iliac bone were placed at the condylar defect zone. The extremity was splinted. The curettage and culture material were sent for pathological examination.

Histopathological examination of the debridement material revealed caseified granulomatous inflammatory reaction compatible with TB. Culture for TB was negative. The patient was diagnosed with TB osteomyelitis of the right distal femoral epiphysis, and a regimen of anti-TB therapy was started. The anti-TB therapy was planned as a one-year curative strategy, of which the first two months comprised a triple regimen of isoniaside (20 mg/kg/day), rifampycine (10 mg/kg/day), and pyrazinamide (20 mg/kg/day), and the

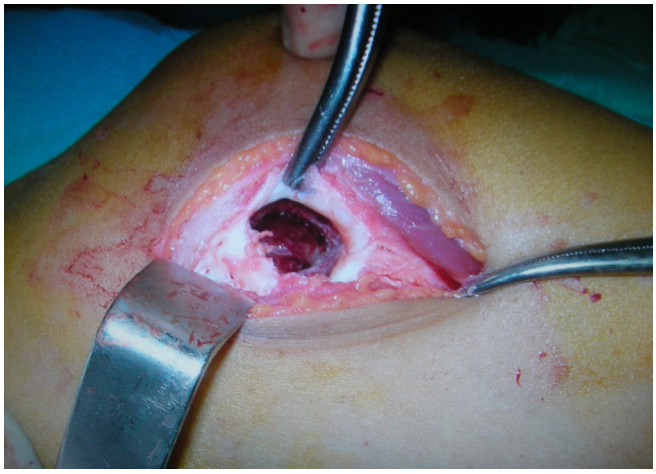

Figure 3. Distal femoral epiphyseomedial approach during surgery.

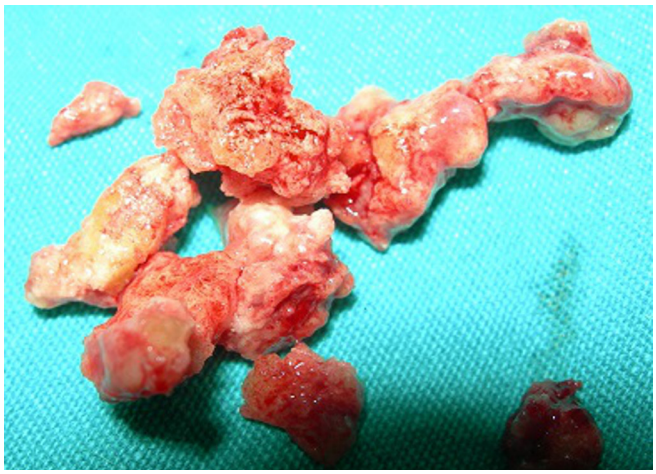

Figure 4. Debrided yellowish-reddish material is seen, post-operatively.

remanining period consisted of a double medication of isoniaside and rifampycine. The splint which was stabilizing the extremity was removed at the 6th week following the operation, and the patient was mobilized. The child was very active at his third-month control. He gave no complaints at his post-operative 12-month control, which was also after the cessation of anti-TB therapy. Control plain radiograms and CT examinations demonstrated that the large lytic lesions which were located at the epiphysis of the medial condyle of the femur had substantially undergone ossification and their connection with the joint space had been obstructed [Figure 5].

DISCUSSION

Skeletal TB usually develops secondarily to a primary focus. This primary focus is usually the lungs in children. If the lung infection is not treated, the TB bacilli migrate and settle down at the skeletal system by means of hematogenous or lymphatic spread 10 % of cases. Skeletal TB may manifest as an infection of the bony tissues, the joints, or the soft tissues, or a combination of these, according to the site of affection. About 50 % of skeletal TB cases affect the spine [3,5,8]. TB arthritis comes second, and TB osteomyelitis comes third, in frequency [4,8,13].

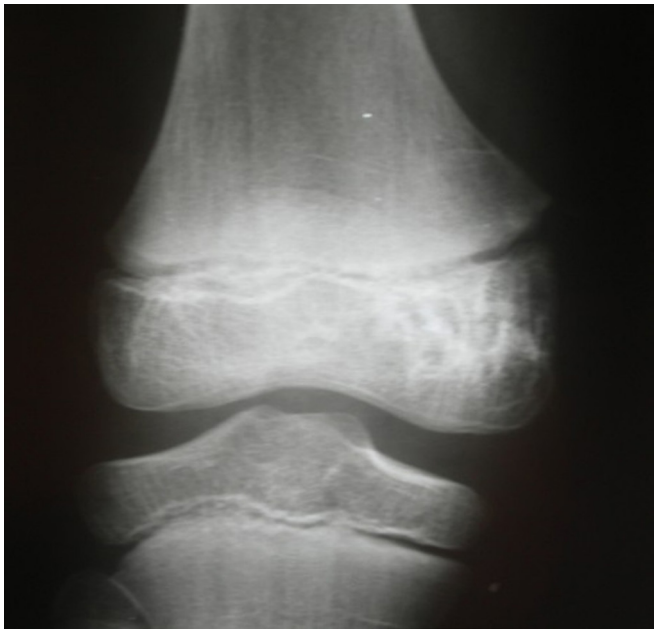

Figure 5. 12 months after the operation, the large lytic lesions demonstrate substantial ossification on this AP view of the knee.

TB arthritis is usually monoarticular. The hips and then the knees are the most frequently affected joints [4,8]. TB arthritis develops either as a spread of the osteomyelitis to the joint by means of crossing the epiphyseal plate, or the direct settlement of the microorganism to the joint synovium. Arthritis due to bony spread is more frequent [4,8]. Transepiphyseal spread is characteristic for TB, and it is not encountered in pyogenic arthritis [4]. Periarticular osteopenia may be seen in the early phases of TB arthritis. There may also be fluid in the joint. The joint space is usually preserved in early TB. As the disease progresses, a gradual increase in joint space narrowing takes place. Contrary to pyogenic arthritis, bony fusion is rare. In the pediatric patient, it is ordinary that a lytic bony lesion accompanies TB arthritis [8].

The term "long bone TB" is depicted as the affection of the metaphyseal site [6-9]. Primary affection is not common. In almost all of the patients presenting with metaphyseal TB osteomyelitis, there are certain radiologic findings. The earliest finding is soft tissue swelling. In most of the cases, metaphyseal lesions are typically solitary and lytic in nature [4,6-8,14]. These are radiolucent lesions with unsharp borders, demonstrating shapes differing from round to oval. In addition to these types of lesions, infiltrative lesions and focal erosions, too, may be encountered [9]. The lesions created at the metaphyses of long bones of children by TB osteomyelitis may resemble many benign entities radiologically, such as non-ossifying fibroma (NOF), metaphyseal cortical defect, osteoid osteoma, osteoblastoma, solitary bone cyst, aneurysmal bone cyst, chondromyxoid fibroma, eosinophilic granuloma, fungal infection, and pyogenic osteomyelitis. Malignant lesions such as Ewing sarcoma and acute leukemia are in the differential list, too [10].

It is rather rare to encounter an epiphyseal lesion in TB osteomyelitis. Such a lesion may be caused by direct dissemination of the metaphyseal lesion to the epiphysis by crossing the growth plate, or by hematogenous spread from the primary focus. The epiphyseal TB lesion is lytic in nature, and eccentrically located [10]. In various studies, it was emphasized that primary epiphyseal affection is predominantly encountered in preadolescent males and also that the lesions are usually defined as unilocular, spheric, and punched-like (6,9). The lytic lesions caused by TB affecting the epiphyses of the long bones may mimic certain other pathological conditions which may produce similar epiphyseal lesions, such as subacute primary osteomyelitis, chondroblastoma, atypical mycobacterial epiphyseal osteomyelitis, BCG osteomyelitis, eosinophilic granuloma (EG), and NOF [10-12]. In our case, TB osteomyelitis had developed directly at the epiphysis, without any metaphyseal affection. The child did not have a lung infection

Ultimate diagnosis in skeletal TB may be made by the histologic demonstration of the characteristic caseified granulomas, or by the growth of the TB bacilli in lab culture [6,7,9,10]. WHO has reported that bone / joint radiography and histologic examination are mandatory for the diagnosis of osteoarticular TB (15). In our case, definitive diagnosis was made by the histopathological examination of the curattage material.

The debridement of the lesion site together with a combined anti-TB therapy for 9-12 months has been accepted as the best means of therapy in TB osteomyelitis [6,9]. It has been reported that it is not necessary to fill the post-curattage bony defect with graft, because this defect usually closes by itself during the anti-TB therapy. Anti-TB therapy is administered as a triple administration of isoniazide (H), rifampycine (R), and pyrazinamide (Z), or a four-drug combination consisting of these three drugs plus ethambutol (E) or streptomycine [6,9,14]. WHO has advised a four-leg drug therapy (HRZE) during the first two months, followed by a two-leg drug therapy (HR) during the following 10 months, of the therapy schedule, in children with suspected or proven osteoarticular TB (15). In our case, the lesion affecting the larger part of the medial condyle of the right femur was debrided and the defect was grafted. Skeletal TB lesions reported in the literature are usually small, and their sizes differ from 0.5 to 3.0 cm [6,9]. We chose to graft the lesion, because its size was big (4 cm) and we wanted to augment its healing. We administered the combined anti-TB therapy regimen for one year. The administration of a triple-combined drug therapy during the first two months, followed by a double-combined medication, proved to be sufficient.

In conclusion, it must be emphasized that TB is still a serious health problem throughout the world. TB osteomyelitis must always be kept in mind in the differential diagnosis of lytic lesions encountered in the long bones of children. Complete healing without any sequelae was obtained in our case, by means of a proper surgical resection and post-operative anti-TB therapy.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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