



(CASE REPORT)



Osteomyelitis Tuberculosis in long bone mimicking bone malignancy: A case report

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Abstract

Osteomyelitis tuberculosis in developing countries is still a severe problem. Early diagnosis and treatment of osteomyelitis tuberculosis are very important because a delay in diagnosis can resemble malignancies. Osteomyelitis tuberculosis is often difficult to distinguish from a malignancy both clinically and radiologically. We present a rare case of a 10 years old boy with chief complaint was a lump around his left knee. He was treated earlier at a peripheral hospital as a malignancy process of bone, and referred to Dr. Soetomo Hospital, as a tertiary hospital, and decided to do an open biopsy in the operating room. On clinical examination was found lump and deformity with surrounding soft tissue swelling and limited ROM. On X-ray examination obtained pathological fractures and bone destruction in the distal femur with a lytic lesion on along the femur metadiaphysis without joint involvement and periosteal reaction proximally, from the examination it cannot be distinguished between osteomyelitis tuberculosis and malignancy. During the surgery, a voluminous amount of odourless pus with multiple septa surrounding the diaphysis. Pus culture and some of the tissue was taken to be examined by pathology that shows connective tissues infiltrated by inflammatory cells. Zeihl-Nielsen staining was done and obtained an image of acid-fast bacilli. Clinical and Radiological Features of osteomyelitis tuberculosis can mimic malignancy. The definitive diagnosis of tuberculosis osteomyelitis is usually made by CT-guided needle aspiration cytology and histologic examination using open biopsy. The latter has better sensitivity, especially if the acid-fast bacilli is obtained.

Keywords: Bone malignancy; Infection; Pathological Fracture; Tuberculosis Osteomyelitis

1. Introduction

Osteomyelitis is a disease of bone, which is characterized by inflammation of the bone marrow and adjacent bone. Often associated with cortical and trabecular bone destruction¹. Osteomyelitis tuberculosis in developing countries is still a serious problem. Diagnosis and treatment of osteomyelitis tuberculosis are very important because the delay in diagnosis can resemble malignancies². Osteomyelitis in bone is often difficult to distinguish from a malignancy both clinically and radiologically³. In the initial phase, these two diseases have similar clinical manifestations and radiological features making it difficult to establish a diagnosis⁴. However, they have far different management, so it is important to distinguish between these two types of diseases so that morbidity and mortality rates can be reduced by providing management accordingly.⁵⁻⁷

Tuberculosis (TB) is the leading cause of death from infectious diseases in the world. World Health Organization (WHO) It is estimated that there were 9.6 million cases of TB (TB) in the world in 2014 and 1.5 million died due to disease⁸. The incidence of tuberculosis (TB) has increased in recent years in developed and developing countries⁹. According to a report from the Iranian Ministry of Health and Medical Education in 2014, Golestan province was ranked second with an incident rate of 38.26 per 100,000. Malignancy in the child's long bones especially around the joints often resembles

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a tuberculosis infection. The picture of TB around the knee resembles osteosarcoma, which is a malignant primary bone tumour originating from primitive mesenchymal cells that produce bone and osteoid matrix¹⁰.

Osteosarcoma usually presents in long bone metaphysis where the epiphyseal growth plate is very active. Namely in the distal femur, proximal tibia and fibula, proximal humerus and pelvis. Initial symptoms are relatively nonspecific such as pain with or without palpable mass¹¹. These symptoms often look like symptoms of osteomyelitis. Difficulties in diagnosing between the two often occur, due to non-specific clinical features such as local swelling of the extremities, pain and the presence of lumps. There is also no specific radiographic picture of osteomyelitis tuberculosis, signs such as osteoporosis, bone lysis, sclerosis, and periostitis are seen in both tuberculosis and pyogenic osteomyelitis, often making it difficult to distinguish this condition.^{12,13}

There are several radiographic images that support tuberculosis compared with neoplastic infections. This includes the presence of small juxtacortical abscesses or rings of inflammatory tissue, due to cortical damage and spread of infection to the extra osseous tissue¹⁴. Definitive diagnosis of TB osteomyelitis is usually established by CT-guided needle aspiration biology cytology and culture on Lowenstein media (sensitivity 50-75%), or by histological examination, which supports the diagnosis of bone TB when acid-resistant bacilli are found (sensitivity of about 70%). Culture and histological studies of bone specimens obtained by surgery have slightly higher diagnostic results¹⁵

This article will discuss a case of Osteomyelitis tuberculosis that is clinically or radiologically similar to Osteosarcoma with the aim of studying and providing an overview of the management of cases of tuberculous osteomyelitis on long bones that resemble clinical features of malignancy.

2. Case Report

A 12-years-old right-handed child, was admitted in October 24th 2019. He complained of swollen feet since 2 months ago, accompanied with fever that fluctuated since 1 month ago, especially at night. Patients also experience weight loss accompanied with decreased appetite. There was no history of coughing for more than 2 weeks in this patient. History of lumps in another region was denied. History of falling 3 months ago, he fell from a motorcycle and was taken to Putung sangkal to be massaged up to 3 times.

From the post traumatic radiological examination of left femur showed radiolucent area at the distal femoral medial metaphysis in the AP position. (Fig. 1). From the radiological examination of left femur when he came to Soetomo Hospital ER, it showed the process of bone destruction in the distal third of the metadiaphysis, accompanied by a fracture. Appears of involucrum in two-thirds proximal femur (Fig. 2).



Figure 1 X-ray photograph of the post-traumatic left femur. A radiolucent area is shown in the distal medial femoral metaphysis in the AP position.



Figure 2 X-ray photograph of the left femur when she came to the ER Dr. Soetomo. Appear to the process of bone destruction in the distal third of the metadiaphysis, accompanied by a fracture. Appears of involucrum in two-thirds proximal femur.

In the MRI of the femoral sinistra shows a destruction in the 1/3 distal metadiaphysis of the femoral sinistra with a distal femoral fracture accompanied by soft tissue mass bulging with fluid collection with a fluid level image and a mass urging effect, shows an osteomyelitis accompanied by abscess formation

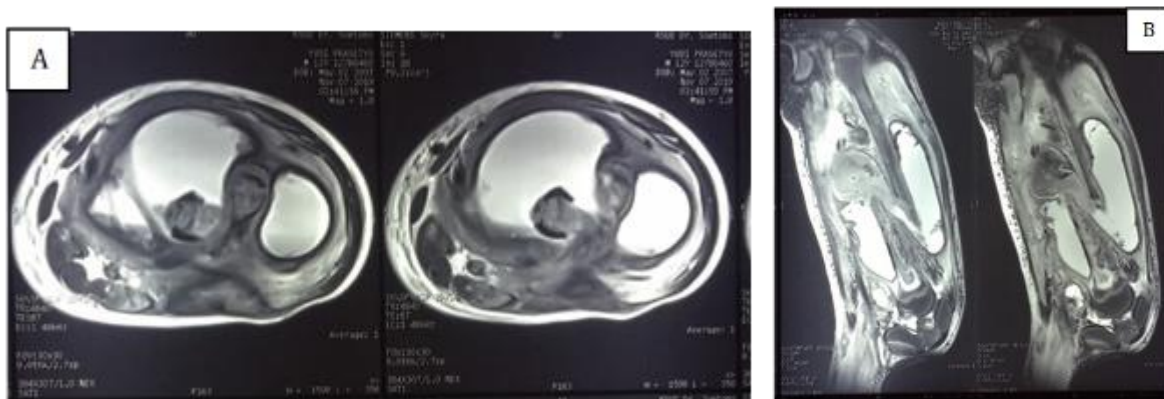


Figure 3 (A) MRI of the axillary femoral axis in T2 sequence. (B) MRI of the sagittal section of the femur in the T2 sequence.

In pathological exam shows tissue fragments consisting of fibrous and fatty connective tissue with inflammation of lymphocytes, histocytes, plasma cells, neutrophils and foamy macrophages. Proliferation and blood vessel dilation appear. Among them looks mature bone trabeculae. There were no visible signs of malignancy. On Ziehl Neelsen smear BTA bacteria was found. With the conclusion that osteomyelitis tuberculosis.

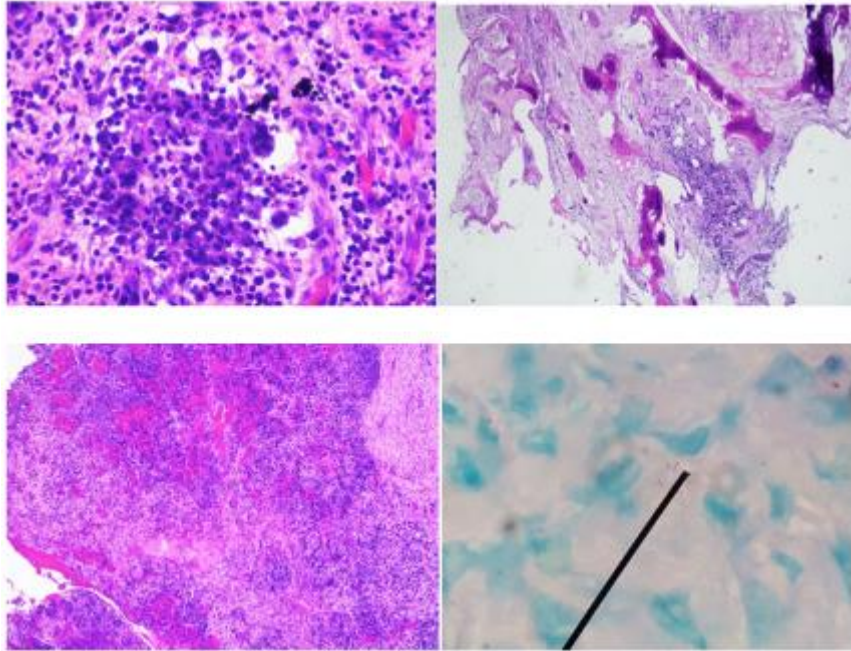


Figure 4 Picture of tuberculosis bacteria in Ziehl Nielsen Smear

Laboratory tests revealed an anemic patient with 7.3 Hb with hypochromic microchitic erythrocyte profiles. The patient was also hypoalbumin with an albumin value of 2.0 g / dl. Infection markers in this patient showed an increase with a blood sedimentation rate of 38mm / hour and a CRP value of 3.8 mg / dl, but the leukocyte value was still within the normal range, 9,160 μ L. The type of count picture in this patient is not conclusive with the borderline shift to the left picture. Lactate dehydrogenase enzyme value of this patient is still in the normal range of 108 U / L and the value of alkaline phosphatase is still within the normal limit of 88 U / L.

In this patient with a sinus on the posteromedial side of the femoral sinist, a culture of fluid from the sinus was performed. Blood culture is done to see the spread of hematogenous infections. From the results of pus culture, it was found that the formation of positive gram coccus bacteria, against the background of polymorphonucleate cells and epithelium, the culture results were *Staphylococcus aureus* bacteria. In anaerobic culture, there is no anaerobic bacteria and acid-resistant bacilli bacteria are not found in Zeihl-Nielsen painting.

Patients underwent Debridement surgery, tissue cultured, Lautenbach in-out irrigation, and backslab immobilization on 21 November 2019 performed by Sulis Bayusentono.



Figure 5 Intra-operative Clinical Image



Figure 6 Post-operative Clinical Image

From the results of histopathological examination of the tissue biopsied by surgery, it was found that tissue fragments consisted of fibrous and fat connective tissue with infiltration of histiocyte lymphocyte cells, plasma cells, neutrophils and foamy macrophages. The appearance of proliferation and dilation of blood vessels. Among them looks mature bone trabeculae. There were no visible signs of malignancy. In this tissue Zeihl-Nielsen was stained, an acid resistant bacillus was obtained.

3. Discussion

The most common symptoms of tuberculosis osteomyelitis are unspecified pain and swelling. As a result, as in the case above, bone tuberculosis often mimics osteosarcoma, which leads to an incorrect initial diagnosis and delay in treatment institutions³.

Extra-pulmonary tuberculosis often appears as a malignancy. Despite the availability of better imaging and other diagnostic tests, extra-pulmonary TB is a disease that is difficult to diagnose, because manifestations are often non-specific. Therefore, immediate recognition by doctors of the distinguishing features is very important, to facilitate timely anti-tuberculosis therapy. Specifically, imaging is the main tool in helping to make a diagnosis of extra pulmonary TB, through the recognition of certain key radiological patterns. However, because there were no pathognomonic imaging findings, the final diagnosis was based on histological and microbiological confirmation. In the past open surgical biopsies were needed to take tissue samples, whereas now they can be obtained with a minimum of invasive, under radiological guidance.^{2,3}

Extra spinal tuberculosis osteomyelitis appears as a cold abscess, with swelling and only mild erythema and pain, and may be misdiagnosed as a tumor. Not infrequently this disease mimics malignancy. For example, bone tuberculosis can clinically simulate a Brodie abscess, cystic bone lesions, bone tumors, chronic pyogenic osteomyelitis or fungal / bacterial granulomatous lesions, and even osteosarcoma. The earliest manifestation is pain, which can precede signs of inflammation for weeks or months. Fever and systemic symptoms are usually absent. Initially radiographs may show soft tissue swelling, but later osteopenia, periosteal thickening, and bone destruction. Cold abscesses and fistulas develop in advanced cases. Chest radiography shows pulmonary disease in a third of cases, but active pulmonary TB rarely occurs⁷. The initial stage is often misdiagnosed, and joint disease is associated with trauma, degenerative disease, gout or pseudo gout, rheumatic diseases such as rheumatoid arthritis, or pigmented villonodular synovitis. Diagnosis requires a high index of suspicion and is usually made through arthrocentesis, biopsy of lesions and mycobacterial culture; However, synovial biopsy is often needed¹⁶. In early cases, prolonged anti-tuberculosis therapy results in complete resolution. Surgery is needed in advanced cases, which may require arthrodesis or joint arthroplasty. Solitary lesions in long tubular bone diaphysis can mimic chronic pyogenic osteomyelitis, Brodie abscesses, cystic lesions, tumors or granulomatous lesions, whether fungal or bacterial¹⁶. Solitary cystic tubercular lesions of diaphysis are very common in children. In Diaphyseal intracortical lesions especially, as in our case, it is important to exclude osteoid osteomas, intracortical hemangiomas and type three Brodie abscesses¹⁶. A special type of tuberculosis osteomyelitis, cystic tuberculosis, produces round or oval radiolucent with varying amounts of sclerosis. This finding, however, is not specific, and can be found in a variety of pathological processes, including neoplasia. However, there are several radiographic features that support tuberculosis compared to neoplastic infections. This includes the presence of small

juxtacortical abscesses or rings of inflammatory tissue, due to cortical damage and spread of infection to the extra osseous tissue^{5,14}.

Apart from that, the characteristics of tuberculosis osteomyelitis vary and are not constant so that further investigation is needed. Our patients are children, on clinical examination found deformity, soft tissue swelling and limited movement of pain. On X-ray examination found pathological fractures and bone destruction in the distal femur, from the examination can not be distinguished between osteomyelitis tuberculosis and malignancy. The MRI of the femoral sinistra shows a distortion of 1/3 distal metadiaphysis destruction of the femoral sinistra with a distal femur 1/3 fracture accompanied by soft tissue mass bulging with fluid collection in it with a fluid level picture and the effect of mass urges accompanied by abscess formation, the MRI examination supports diagnosis osteomyelitis⁴. This is also supported by an increase in lab sedimentation rates and CRP levels and no increase in lactate dehydrogenase and alkali. The diagnosis is confirmed by histopathological examination of the tissue biopsied by surgery and there are no signs of malignancy. In this tissue Zeihl-Nielsen staining was performed, an acid resistant bacillus was obtained⁶.

There is no specific radiographic picture of osteomyelitis tuberculosis. Signs such as osteoporosis, bone lysis, sclerosis, and periostitis are seen in both tuberculosis and pyogenic osteomyelitis, often making it difficult to distinguish this condition. Occasionally, radiographic findings are similar to those in Brodie's abscess⁴.

The definitive diagnosis of bone TB is usually established by CT-guided needle aspiration biology cytology and culture on Lowenstein media (50-75% sensitivity), or by histological examination, which supports the diagnosis of bone TB when acid-resistant bacilli are found (sensitivity of about 70%). Culture and histological studies of bone specimens obtained by surgery have slightly higher diagnostic results. In Diaphyseal intracortical lesions especially, as in our case^{14,16}.

4. Conclusion

Clinical and Radiological Features of osteomyelitis tuberculosis can mimic malignancy. The definitive diagnosis of tuberculosis osteomyelitis is usually made by CT-guided needle aspiration cytology and histologic examination using open biopsy. The latter has better sensitivity, especially if the acid-fast bacilli is obtained

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest in this study.

Statement of ethical approval

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Statement of informed consent

Statement of informed consent Informed consent was obtained from all patients included in the study. All the patient data are classified.

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