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Case Report: Open Access

Subacute Metacarpal Osteomyelitis in a Child

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Abstract

Subacute osteomyelitis is a rare affection. Clinical presentation is often unclear and can lead to a delay in diagnosis. As a matter of fact, subactue metacarpal osteomyelitis is usually missed at the first time, so that some complications may occur like brachymetacarpia or loss of motion. We report a 10 year-old boy, with a subacute metaphyseal osteomyelitis of the second right metacarpal bone. The radiological features can mimic various benign or malignant bone tumours and non-pyogenic infections. Histological confirmation is necessary to avoid a delay in diagnosis. Treatment was based on antibiotics and surgical debridement. No infectious agent was found in bacteriological exams. At 1 year of follow-up, noncompliance was reported with a normal motion of the finger. X-ray views showed a bone reconstruction with a fibrosis of ulnar part of the metaphysis without length discrepancy.

Keywords

Subacute, Metacarpal, Osteomyelitis, Treatment, Complications

Introduction

Subacute metacarpal osteomyelitis in children is a rare affection. Despite the tropism of the acute form to the metaphyseal of long bones especially in lower limb, subacute form doesn't respect to this concept. It is characterized by a particular pathology of occurrence.

The aim of our case report is to reveal the main features of the subacute metacarpal osteomyelitis in children, review the treatment options and the outcome.

Case Report

We report a 10 year-old boy, admitted in our department suffering from pain and stiffness of the second metacarpophalangeal joint of his right hand that had been started for two months ago. No fever neither infectious signs were found. Physical examination revealed a little reduction of motion in metacarpophalangeal joint without swelling or injuries signs (Figure 1). Temperature was normal. Lab findings were negative. X-ray views showed a well-defined radiolucent defect in the ulnar part of the metaphysis of the second metacarpal bone associated with a sclerosis in the radial part (Figure 2). Scan tomography found a radiolucent defect of the metaphyseal part of the carpal bone (Figure 3) advocating an infectious disease. The diagnosis of subacute osteomyelitis was suspected. Hence,

Figure 1: The dorsal view of the hand before the intervention.

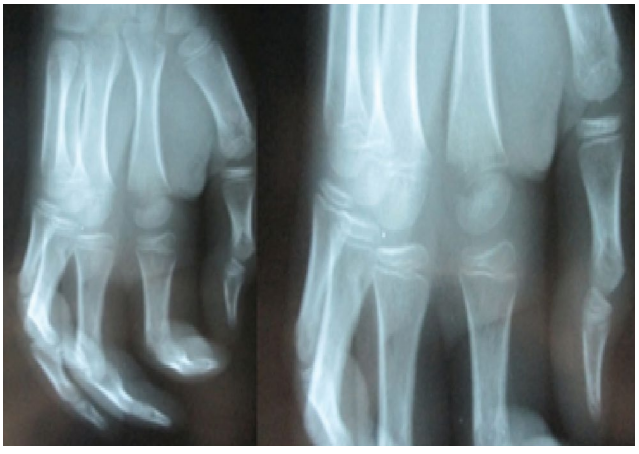

Figure 2: X-ray views of the right hand revealing a bone defect on the radial part the metaphysis of the second metacarpal.

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Figure 3: Tomography scan of the finger: a,b: sagittal views of the finger showing the bone defect, c: transverse axial view revealing the defect on the radial part of the metaphysic.

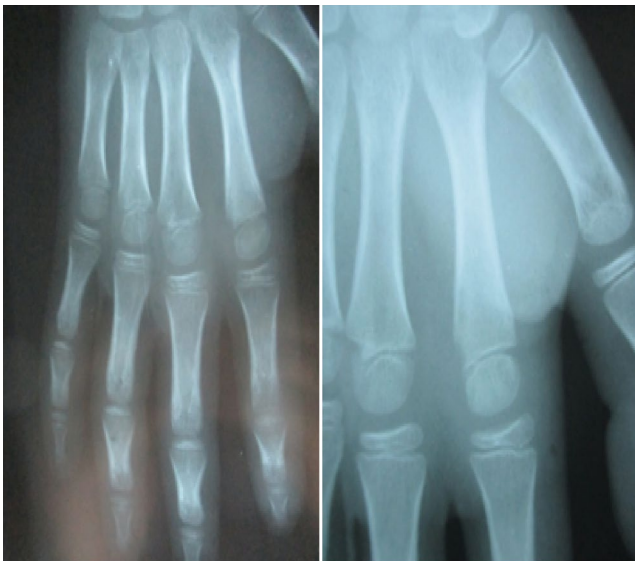

Figure 4: The last X-ray views of the right hand obtained after one year from surgical debridement with a bone reconstruction and a little fibrosis in the infection site.

intravenous empirical antibiotic therapy based on oxacillin and gantamicin, was started. The daily doses were respectively 1500 mg and 80 mg. Unfortunately, clinical evolution, after 7 days of antibiotic therapy, was unfair with the same stiffness and pain. As a matter of fact, the surgical treatment is advocated and a dorsal approach of the joint was used. Operative exploration found a destruction of both the bone and the metaphyseal cartilage by a local reaction associated to fibrosis and membranous tissues formations without purulent aspect. Surgical debridement of the infected side was undertaken and the hand was immobilized with a plaster splint for 3 weeks. Intravenous antibiotics were continued for one week until results of histological exam which confirmed the infectious origin of the affection without infectious agent in bacteriological findings. Hence, antibiotic therapy based on oxacillin, with a daily dose of 1500 mg, had been continued orally for 3 weeks. During one year of follow, the boy did not report any compliance. The aspect of hand is normal; the second finger regained 260° of total range of motion (TAM) without deformity and abnormalities. The last x-ray views showed a bone reconstruction with a fibrosis of ulnar part of metaphysic (Figure 4).

Discussion

Subacute metacarpal osteomyelitis in children is a scarce disease [1]. A few published cases were about the acute form [2,3]. Although, the primary acute haematogenous osteomyelitis in childhood is commonly localized in the metaphysis of long bone, subacute form doesn't have the same characteristics and can affect diaphysis [4]. The most affected metaphysis in subacute osteomyelitis is the tibia [4]. Metaphyseal localization in the hand bones are possible but have never been described. Several studies showed that subacute osteomyelitis occurs each time there is a decreased bacterial virulence and an increased host resistance [5-7]. Moreover, early antibiotic therapy in acute form seems to have a rule in occurrence of subacute form since it decreases the virulence of infectious agents [4,5]. Subacute metacarpal osteomyelitis may occur in metaphysis but also in both diaphysis and epiphysis and can be described in radiological findings according to Roberts's classification [7]. The main difficulty in the management of subacute metacarpal osteomyelitis is making the diagnosis [8]. In this form, physical examination doesn't reveal abnormalities and a little reduction of motion and a mild pain are often seen without any systemic manifestations, so that the infectious origin is usually missed at the first examination [7,8]. In spite of the benignity of this affection, other benign and malignant affections must be advocated in the differential diagnosis, including eosinophilic granuloma, osteoid osteoma, chondroblastoma, tuberculosis, fungal infection, osteosarcoma, Ewing's sarcoma, leukaemia and round cell tumours [9-11]. Actually, studies of the subacute osteomyelitis showed the important value of MRI in diagnosing osteomyelitis in children also pointing to gadolinium-enhanced imaging as the most sensitive [4,12,13]. MRI exploration helps to localize the affection of the bone and provide an objective control of the lesion extent [10,14]. However, X-ray views may underestimate the bone destruction and remain normal until the step of irreversible progression of the infection [15,16].

Treatment of this affection is controversial [17]. The recommended treatment for subacute osteomyelitis with a lucent lesion or nidus has been curettage, biopsy and culture followed by immobilization and antibiotics [7,10,17]. In diaphyseal lesions with a periosteal reaction a core of bone should be taken which includes periosteum, cortex and medullary contents [18]. The diagnosis is usually confirmed by histological examination which shows an inflammatory component with scattered lymphocytes, plasma cells and granulation tissue [11,17,18]. *Staphylococcus aureus* is regarded as the causative organism by most authors. It is, however, difficult to identify. [17-19]. Several studies concluded that antibiotics alone may be adequate and surgery should be reserved for "aggressive lesions" and those which do not respond to antibiotics [18,19]. Cloxacillin is the antibiotic of choice in the treatment of subacute osteomyelitis and is given orally for six weeks after an initial intravenous course for up to five days [19]. Subacute metaphyseal osteomyelitis has been shown to disturb the growth plate and compromise the joint [19,20].

In our case report, subacute osteomyelitis of metacarpal bone had been showed to have a satisfied functional and radiological outcomes comparing to the other forms of infectious bone diseases. Antibiotic therapy indicated for five weeks with only two weeks of intravenous treatment seems to be curative and enough.

It is important to re-emphasize that subacute form is a clinical entity which is distinct from the acute form and from those types in which the clinical presentation has been modified by the administration of antibiotics. These lesions are frequently confused with a variety of benign and malignant bone tumours and non-pyogenic infections.

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We, authors of these papers certify that there is no conflict of interest.

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