

Subacute metacarpal osteomyelitis in a child

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Subacute osteomyelitis is a rare affection. Clinical presentation is often unclear and can lead to delay in diagnosis. As a matter of fact, subacute metacarpal osteomyelitis is usually missed at first, so that some complications may occur, e.g., brachymetacarpia or loss of motion. We report on a 10-year-old boy with subacute metaphyseal osteomyelitis of the second right metacarpal bone. Radiological features can mimic various benign or malignant bone tumors and non-pyogenic infections. Histologic confirmation is necessary to avoid delay in diagnosis. Treatment was based on antibiotics and surgical debridement. No infectious agent was found on bacteriologic testing. At 1-year follow up, no complications were reported and the finger showed normal range of motion. X-ray views showed bone reconstruction with fibrosis of the 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 acute form tropism to the long bone metaphysis, especially in lower limbs, the subacute form does not follow this concept. It is characterized by particular involvement pathology.

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

CASE REPORT

We report on a 10-year-old boy admitted to our department for pain and stiffness of the second metacarpo-phalangeal joint of his right hand that had started two months before. No fever or infectious signs were found. Physical examination revealed a little reduction of motion in the metacarpo-phalangeal joint without swelling or signs of injury (Figure 1). Temperature was normal. Laboratory findings were negative. X-rays showed a well defined radiolucent defect in the ulnar part of the metaphysis of the second metacarpal bone, associated with sclerosis in the radial part (Figure 2). Scan tomography found a radiolucent defect of the metaphyseal part of the carpal bone (Figure 3) suggesting an infectious disease. The diagnosis of subacute osteo-



FIGURE 1. Dorsal view of the hand before the intervention.

myelitis was suspected. Hence, intravenous empirical antibiotic therapy based on oxacillin and gentamicin was start-

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Primljeno/Received: 30. 5. 2015., Prihvaćeno/Accepted: 25. 2. 2016.

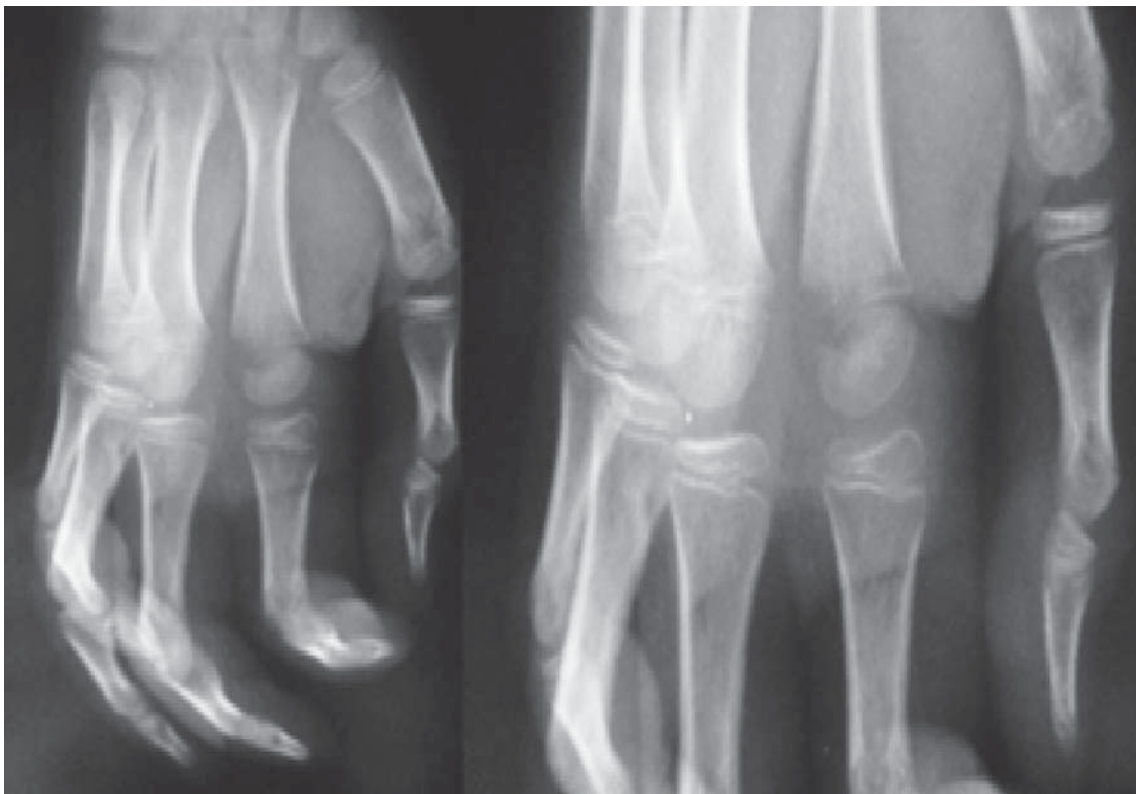


FIGURE 2. X-rays of the right hand revealing a bone defect on the radial part the metaphysis of the second metacarpal bone.

ed at daily doses of 1500 mg and 80 mg, respectively. Unfortunately, clinical evolution, after seven days of antibiotic therapy, was unfavorable, with the same stiffness and pain. As a matter of fact, surgical treatment is advocated and a dorsal approach to the joint was used. Operative exploration found destruction of both the bone and the metaphyseal cartilage by local reaction associated with fibrosis and membranous tissues formations without purulent aspect. Surgical debridement of the infected site was undertaken and the hand was immobilized with a plaster splint for three weeks. Intravenous antibiotics were continued for one week until the results of histologic examinations confirmed the infectious origin of the affection without infectious agent in bacteriologic findings. Hence, antibiotic therapy based on oxacillin at a daily dose of 1500 mg *per os* was continued for three weeks. During one-year follow up, no complications were reported. The aspect of hand is normal; the second finger regained 260° of the total range of motion without deformity and abnormalities. The last x-ray showed bone reconstruction with fibrosis of the ulnar part of the metaphysis (Figure 4).

DISCUSSION

Subacute metacarpal osteomyelitis in children is a rare disease (1). A few published cases refer to the acute form (2, 3).

Although primary acute hematogenous osteomyelitis in childhood is commonly localized in the metaphysis of long bone, the subacute form does not have the same characteristics and can affect diaphyses (4). The most affected metaphysis in subacute osteomyelitis is the tibia (4). Metaphyseal localization in hand bones is possible but has never been described. Several studies showed that subacute osteomyelitis occurred when there was a decreased bacterial virulence and an increased host resistance (5-7). Moreover, early antibiotic therapy in the acute form seems to as a rule result in the 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' classification (7). The main difficulty in the management of subacute metacarpal osteomyelitis is making the diagnosis (8). In this form, physical examination does not reveal abnormalities and a little reduction of motion and mild pain are often seen without any systemic manifestations, so that the infectious origin is usually missed at first examination (7, 8). In spite of the benign nature of this affection, other benign and malignant disorders must be considered on differential diagnosis, including eosinophilic granuloma, osteoid osteoma, chondroblastoma, tuberculosis, fungal infection, osteosarcoma, Ewing's sarcoma, leukemia and round cell tumors (9-11). Actually,

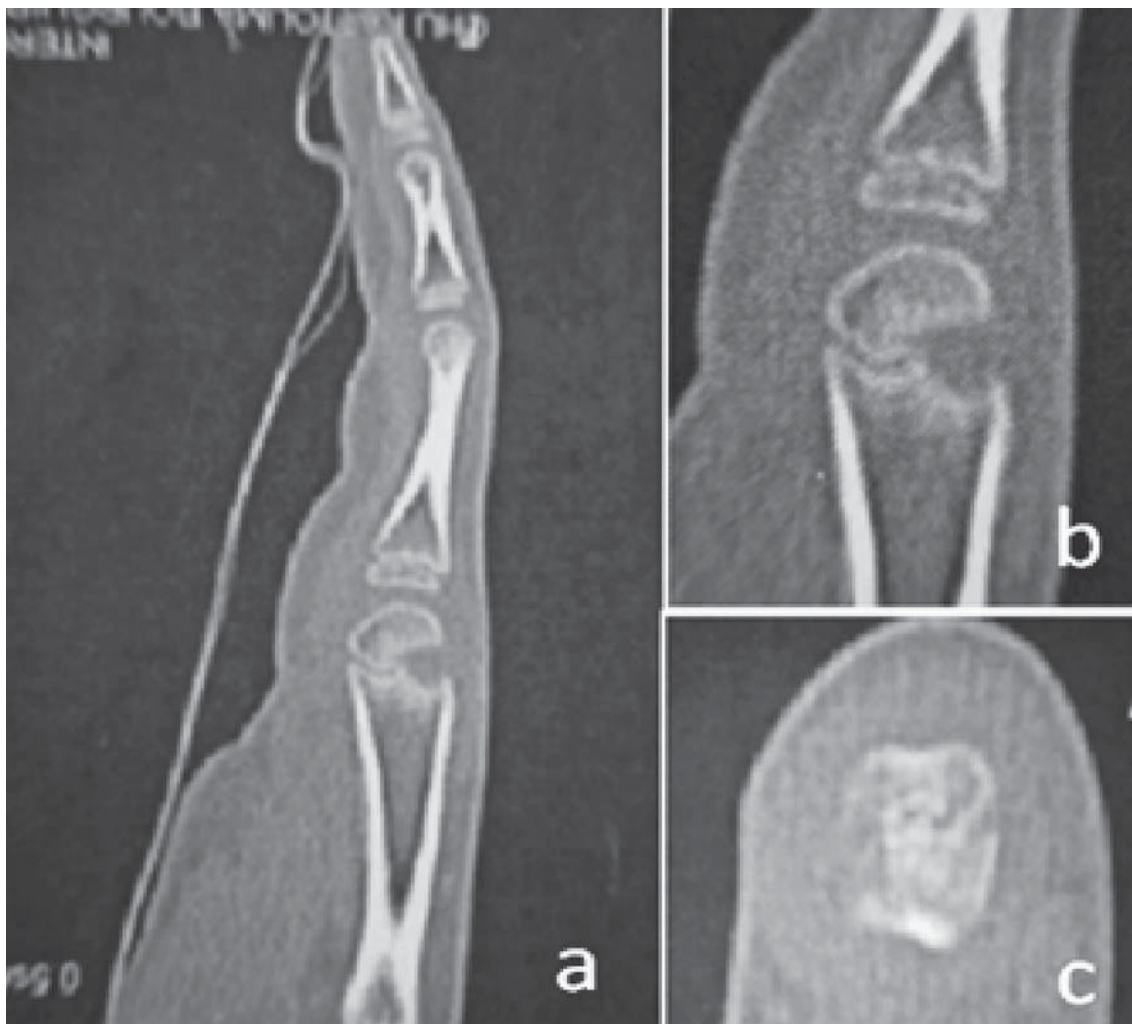


FIGURE 3. Tomography scan of the finger: (a,b) sagittal views of the finger showing the bone defect; (b) transverse axial view revealing the defect on the radial part of the metaphysis.

studies of subacute osteomyelitis have demonstrated the value of magnetic resonance imaging (MRI) in diagnosing osteomyelitis in children, also pointing to gadolinium-enhanced imaging as the most sensitive one (4, 12, 13). MRI exploration helps localize the affection of the bone and provide an objective view of the lesion extent (10, 14). However, x-rays may underestimate bone destruction and remain normal until the irreversible progression of the infection occurs (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 periosteal reaction, a core of the bone should be taken which includes periosteum, cortex and medullary contents (18). The diagnosis is usually confirmed by histologic examination, which shows an inflammatory component with scattered lymphocytes, plasma cells and

granulation tissue (11, 17, 18). *Staphylococcus aureus* is regarded as the causative agent by most authors. It is, however, difficult to identify (17-19). Several studies have concluded that antibiotics alone may be adequate and surgery should be reserved for 'aggressive lesions' and those that 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, subacute osteomyelitis of metacarpal bone had a satisfactory functional and radiologic outcome comparing to other forms of infectious bone diseases. Antibiotic therapy indicated for five weeks with only two weeks of intravenous treatment seems to be adequate and curative.

It is important to re-emphasize that the subacute form is a clinical entity which is distinct from the acute form and

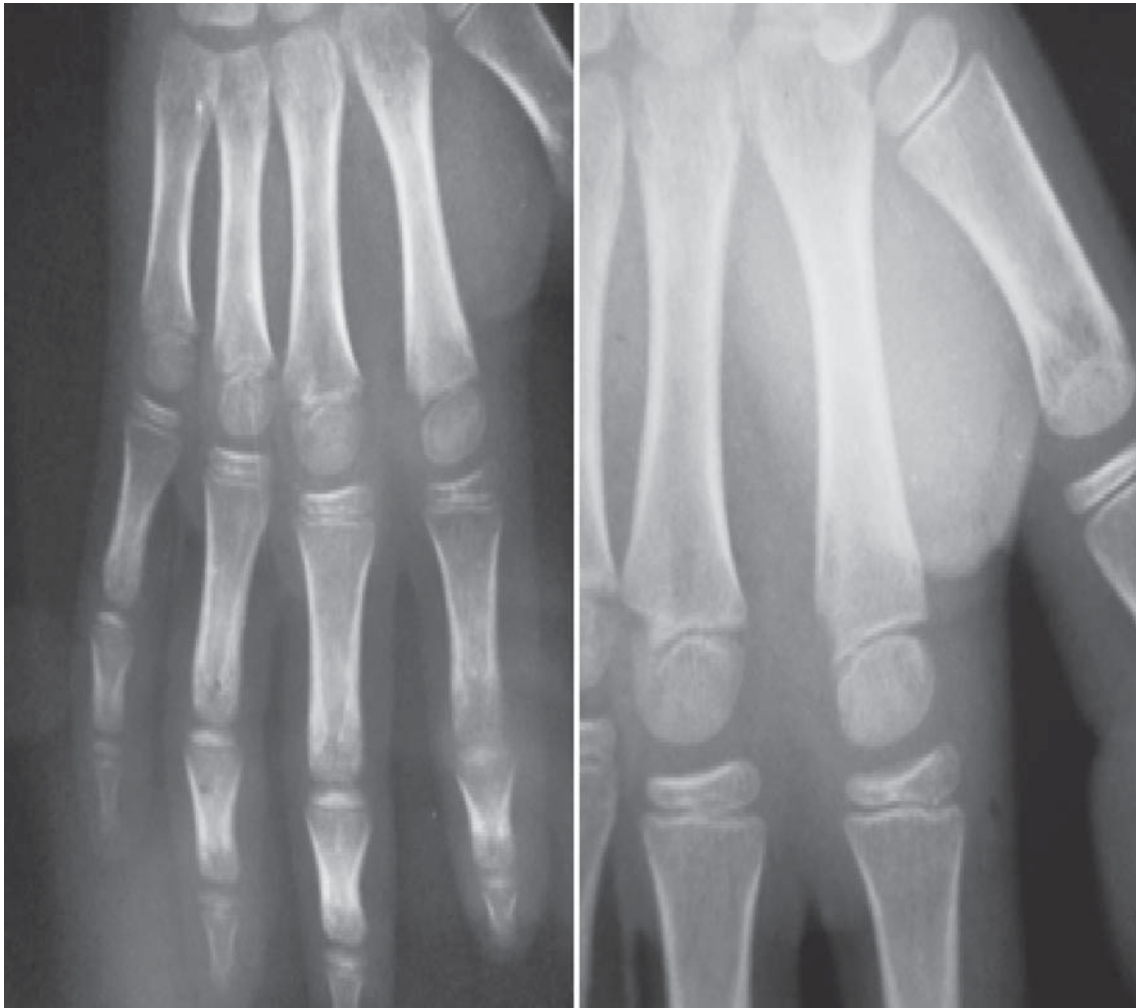


FIGURE 4. The last x-ray of the right hand obtained after one year of surgical debridement with bone reconstruction and mild fibrosis at the infection site.

from those types in which clinical presentation has been modified by the administration of antibiotics. These lesions are frequently confused with a variety of benign and malignant bone tumors and non-pyogenic infections.

NOVČANA POTPORA/FUNDING

Nema/None

ETIČKO ODOBRENJE/ETHICAL APPROVAL

Nije potrebno/None

SUKOB INTERESA/CONFLICT OF INTEREST

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SAŽETAK

Subakutni metakarpalni osteomijelitis u djeteta

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Subakutni osteomijelitis je rijetka bolest. Kliničke manifestacije su često nejasne i mogu odužiti postavljanje dijagnoze. Zapravo, subakutni metakarpalni osteomijelitis obično se isprva ne prepoznaje pa može doći do komplikacija kao što je brahimetakarpija ili gubitak pokreta. Opisuje se slučaj 10-godišnjeg dječaka sa subakutnim metafizealnim osteomijelitisom druge desne metakarpalne kosti. Radiološke značajke mogu oponašati razne dobroćudne ili zloćudne koštane tumore i ne-piogene infekcije. Neophodna je histološka potvrda kako bi se izbjeglo kašnjenje dijagnoze. Liječenje je provedeno antibioticima i kirurškim debridemanom. Nikakav infektivni uzročnik nije otkriven bakteriološkim pretragama. Na kontrolnom pregledu nakon jedne godine nisu zabilježene nikakve komplikacije, uz normalnu pokretljivost prsta. Rendgenske snimke pokazale su rekonstrukciju kosti s fibrozom ulnarnog dijela metafize bez nesrazmjera u duljini.

Ključne riječi: subakutni; metakarpalni; osteomijelitis; liječenje; komplikacije