Subacute Hematogenous Osteomyelitis of the Calcaneum: A Pediatric Case Report and Review of Literature

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Abstract

We report the case of a child 3 years old consulting for brutal installation of equine right foot. The clinical, biological and radiological data allowed us to retain the diagnosis of subacute osteomyelitis of the calcaneum. This rare entity seems to be a particular evolution of the acute form of the osteomyelitis. The prognosis of sub acute osteomyelitis is usually good. Treatment is with antibiotics and curettage is for forms may present a wrong diagnosis or have evolved only on antibiotics. The care of our patients and a literature review are discussed in this article

Keywords: Osteomyelitis; Calcaneus; Children

Introduction

Sub-acute osteomyelitis (subacute OM), in children is an entity to be known, it exposes to diagnostic traps both by its clinical, biological and radiological aspect. Calcaneal localization is rare, accounting for only 3 to 10% of all bone infections in children [1]. Since the first description by Brodie of the central abscess in 1832 [2], Hypotheses have been put forward to explain the appearance after the acute osteomyelitis of a new clinical form, which is sub-acute OM, which currently represents nearly one bone infection out of three [2]. Through our observation were call this entity often unrecognized, and we propose a coherent diagnostic and Therapeutic management.

Case Presentation

This patient is 3 years old with no significant pathological history. He consulted us for an equine walk of the right foot in a context of apyrexia. The interrogation of the mother finds a fever quantified at 38° only once, three weeks before the appearance of lameness. On clinical examination there was lameness to walking, equine attitude of right foot easily reducible. There were inflammatory signs and palpation pain in relation to the right calcaneus. Biology was disturbed with white blood cells at 17.470 el / mm³, a sedimentation rate at 50 mm / 1 hour and a C-reactive protein at 5 mg / l. The standard radiograph of the Foot had shown a lytic image of the calcaneus well limited and surrounded by a sclerotic border (Figure 1). The x-ray of the ankle was normal (Figure 2). The infectious etiology was evoked and an ultrasound was performed. Ultrasound showed a lytic lesion with interruption of the cortical bone of the calcaneum and supplemental magnetic resonance imaging (MRI) was done. MRI showed a bony gap in the plantar and lateral part of the calcaneus near the insertion of the calcaneal tendon of 1 x 0.5 cm in diameter, with an hyposignal in T1 (Figure 3) and an hyper signal in T2 (Figure 4), with absence of tissue mass, there was an inflammatory type signal extended to the soft parts as well as a rupture of the cortical. The diagnosis of subacute osteomyelitis was retained; the patient was put on an oral antibiotic for 21 days and immobilized by a Plaster. The patient resumed support as of the 2nd day of Treatment, with normalisation of his biology. The ultrasound control showed a disappearance of hyper vascularization of the calcaneus. No biopsy curettage was performed.

Discussion

In recent years the face of osteomyelitis has changed considerably, and clinical and biological forms are becoming less and less noisy, probably in relation to the abusive use of antibiotics. The osteomyelitis of the calcaneus obeys the same physiopathological phenomena as those of the long bones. The calcaneum presents an Apophysis, comparable to a metaphysial region of the long bones, which makes it vulnerable to infections. As in the acute form of the osteomyelitis the inoculation of the bone is done by haematogenous way but the evolution is different [1]. The infection remains localized, it is called circonscrite and the first form of central abscess was described by Brodie in
This evolution is explained by some authors either by a less virulence of the germ, or by an increased resistance of the patient or also by an infection decapitated by antibiotic therapy [2]. Our patient received a 48-hours oral antibiotic for a throat infection three weeks before the start of the symptomatology of the right foot. Winiker et al. [3] in 1991 reported a series of acute osteomyelitis of the calcaneus with an average age of six years, for Puffinbarger et al. [4], acute osteomyelitis of the calcaneus was related to direct inoculation in children less than four years of age. In our patient no foreign body and no notion of inoculation were found. The notion of trauma was found in 35% of cases of acute osteomyelitis, this association is not related to the calcaneus [1], and our patient did not present any trauma. Subacute osteomyelitis is distinguished from the acute form by its insidious onset, often Greater than 2 weeks [5] this is a cause of delay diagnosis specially in calcaneal localizations, which often seen at the stage of lytic lacunar lesions. The temperature is often less than 38.5 [1]. The pain is a constant sign [2], the symptomatology can sometimes be summed up with a refusal of support on the algic part of the skeleton as it was the case for our patient. Local inflammatory signs are sometimes noted. The absence of general signs of infection is constant [2]. Blood cultures were always sterile [6]. Puffinbarger et al. [4] report edleukocytosis in 20% of cases, Winiker et al. [3], and Jakkola et al. [7] reported 45 and 24%, respectively. Our patient had leukocytosis at 17470 el / mm³. The rate of sedimentation (VS) was often high [4], for our case it was 50 mm / at the first hour. Winker et al. [3] reported that C-reactive protein (CRP) was normal in 80% of cases, for Jakkola et al. [7] it was high (> 5 mg / l) in only 47% of cases. Our case presented a CRP <5 mg / l. The standard X-ray often finds in subacute osteomyelitis a lytic metaphyseal involvement with peripheral condensation [8,9] with sometimes an epiphyseal prolongation Crossing the conjugal cartilage without growth disorder [9]. The extension canalsobe made towards the soft parts after osteolysis. In sub-acute osteomyelitis the Metaphyseal gap may be well centro-bone limited, often surrounded by a condensation line. It can also be peripheral, juxta-cortical or summarized in a clear zone that erodes the cortical [6]. It may also be a large metaphyseal central abscess that often evolves towards an invasion of the growth cartilage and an extension to the epiphysis. Isolated epiphyseal lesions have only recently been recognized as it is conventional to say that sub-acute OM never touches the epiphysis of long bones alone [10]. Diaphyseal sites in sub-acute osteomyelitis can be seen. The standard radiography in the Diaphyseal localization reveals a cortical thickening, sometimes with a periosteal reaction, evoking the diagnosis of malignant tumor (osteosarcoma or Ewing sarcoma). When a diagnostic doubt exists especially in diaphyseal sites with not limited contour, a biopsy is carried out with a cytological, histological and bacteriological study [10,11]. Our patient presented a limited lytic lesion on the standard X-ray, surrounded by a bone condensation edging classified as stage I of Gledhill [10], just below the calcaneal apophysis. The ultrasound showed a rupture of the cortical and hypervascularization corresponding to the deficient radiological image. At MRI the lesion was in Hyposignal in T1 and hypersignal in T2 enhanced with the injection of contrast agent with the exception of the edema limiting the lesion and corresponding to peri-lesional sclerosis, which is fairly characteristic of Subacute osteomyelitis. The therapeutic attitude towards the subacute osteomyelitis varies according to the authors; we distinguish two attitudes, medical or medico-surgical. Rombouts et al. [9], Ezra et al. [12] advocate parenteral anti-staphylococcal antibiotic therapy for one to two weeks and then orally for three to five weeks. A surgical approach will

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**Figure 1:** Standard Radiograph of Foot.

**Figure 2:** The x-ray of the ankle.

**Figure 3:** Hyposignal of MRI.

**Figure 4:** Hyper signal of MRI.
be proposed only in case of unfavorable evolution or doubt diagnosis [2]. Hamdy et al. [5] reported 20 cases treated surgically and 24 cases treated medically with identical results.

For Green et al. [11], Season et al. [13], Jenzri et al. [1], surgical treatment is systematically associated with parenteral anti-staphylococcal antibiotic therapy and immobilization. This has the double advantage of obtaining a bacteriological diagnosis and Differential diagnosis with other tumor bone lesions by an anatomopathological study. The evolution of sub-acute OM is good in 90% of cases [2]. This good evolution is most probably explained by the pathogenesis of Sub-acute OM. The first mechanism suggests an abnormal form of acute osteomyelitis following insufficient or inadequate treatment [8], this is a localized response of the bone that limits the infectious process in this geodic lesion. The second mechanism evokes a primitive form related to an attenuated virulence of the germ or a greater resistance of the individual to infection [10]. Sub-acute OM lies between the chronic form Complicating an acute osteomyelitis and complete cure. Complications are exceptional, shortened calcaneal growth disorders and irregularities of posterior calcaneal tuberosity have been described in some neonatal forms [14]. Our patient received a first-line oral anti-staphylococcal antibiotic therapy for a period of 21 days with a resumption of plantar support and a marked improvement in the local J2 treatment status. The standard radiography of the calcaneum made at 1 month after the end of the treatment showed a disappearance of the bone gap of the calcaneum.

**Conclusion**

The subacute OM, also called pseudo-tumoral, is more and more frequent at the expense of the acute form. It must be evoked before a non-specific radiographic image often Metaphyseal, integrated with clinical and biological data. The calcaneal localization is rare but its evolution is often good in the child. Surgical curettage is reserved for forms that differentiate diagnosis with malignant lesions in children whose calcaneum is not the most frequent site.

**References**