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Case Report

Calcaneal Osteomyelitis with Persisting Negative X-Rays and Blood Tests

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ABSTRACT

Osteomyelitis in children is a potentially dangerous disease that requires early diagnosis and treatment in order to reduce the risk of sequelae. We describe a case of calcaneal osteomyelitis with the aim of highlighting the challenges in the diagnosis of this condition, that need to be considered also in case of persisting negative blood and radiological tests. A 19 month-old female baby presented to our Emergency Room (ER) with the refusal to walk, pain and swelling of the left calcaneus, without a history of previous traumas. The instrumental examinations (ultrasound, A-P and lateral radiographies) and blood chemistry tests performed were negative. Because of the persistence of symptoms, two days later the patient returned for the second time to our pediatric ER. Radiography and blood chemistry tests results again within normal limits. She was then admitted to hospital and treatment with intravenous ceftriaxone was started suspecting an infectious condition. A Magnetic Resonance Imaging (MRI) of the left foot revealed osteomyelitis of the calcaneus bone. Her condition gradually improved and the child was therefore discharged in good general condition with oral antibiotic therapy at home for another two weeks.

INTRODUCTION

Osteomyelitis in children is a potentially dangerous disease that requires early diagnosis and treatment in order to reduce the risk of sequelae that could compromise the growth and quality of life of involved children. Nevertheless, acute osteomyelitis is not always easy to recognize since bone pain without systemic signs and symptoms, negative imaging and blood tests may confuse the clinician [1]. This is especially true when small bones, like the calcaneus, are involved. In this case, signs and symptoms may be even more subtle, therefore delaying the diagnosis, with potentially severe complications in the pediatric patient such as growth disorders, chronic osteomyelitis and spread to adjacent joints [2]. Therefore, clinical experience and high index of suspicion are necessary for the emergency pediatrician to recognize and promptly treat these conditions. For this reason, we describe the case of calcaneal osteomyelitis with the aim of highlighting the challenges of diagnosing this condition, that need to be considered also in case of persisting negative blood and radiological tests.

CASE PRESENTATION

A 19 month-old female baby presented to our Emergency Room (ER) for rejection to walk, impossibility to load the left lower limb and pain and swelling of the ipsilateral calcaneus appeared eleven day before, completely in apyrexia without preceding history of trauma. In fact, eleven day before this admission, the child was initially

visited as outpatient at the pediatric ambulatory of our hospital and anti-inflammatory therapy and an absolute prohibition of loading were prescribed. Two days later, due to the persistence of symptoms, she went at our ER where instrumental tests were performed (ultrasound and A-P and lateral radiographies) (Figure 1a,1b), which were negative, and blood chemistry tests, that were within normal limits (C-Reactive Protein (CRP) 0.86 mg / dL, Leucocytes 15200/mmc with preserved formula, Erythrocyte Sedimentation Rate (ESR) 11 mm/sec). In the same session she also performed an orthopedic evaluation which made a diagnosis of inflammatory osteitis and advised to continue the anti- inflammatory therapy, the absolute prohibition of loading and a clinical reassessment check carried out performed one week later, during which it was recommended a rheumatologic evaluation. Therefore, because of the persistence of symptoms, two days later the patient returned for the second time to our pediatric ER. At the presentation the physical examination was characterized by good general condition, afebrile, unremarkable vital signs, slight swelling of the left calcaneus, sore and painful, with overlying intact skin, she refused full load; the remaining musculoskeletal examination was normal, including the clinical examination of other joints. Plain radiography of the left calcaneus was repeated which did not document any bone injury but only swelling of the surrounding soft tissues (Figure 2a) and blood chemistry tests results again within normal limits (Leucocytes 16,900/mmc, N 31.2%, 58.4% L, Hb 12.2, PLT 521000/mmc, negative CRP and ESR). She was then admitted to hospital and treatment with intravenous ceftriaxone was started suspecting an infectious condition. Ultrasound was performed again and showed simple thickening of soft pericalcanear tissues in the absence of other structural alterations (Figure 2b). Six day after admission to the hospital a Magnetic Resonance Imaging (MRI) of the left foot was obtained and it revealed osteomyelitis of the calcaneus bone (Figure 3). Blood tests performed during hospitalization have been always in the normal range. Her condition gradually improved with a reduction of pain, swelling of the calcaneus and gradual recovery of walking. The child was then discharged in good general condition with oral antibiotic therapy at home for another two weeks. At the end of treatment she was re-evaluated at the clinic of infectious diseases where the symptoms had completely resolved and she was able to fully load the bone without pain. X-ray was performed during follow-up and still resulted normal.

Figure 1a

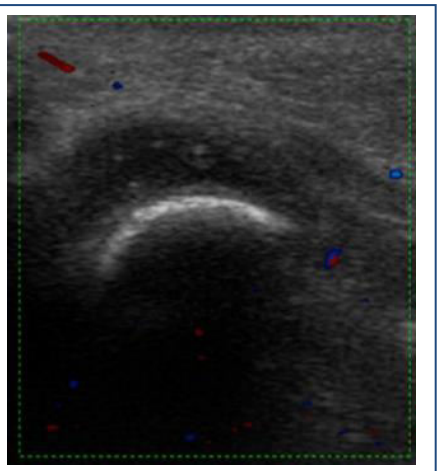


Figure 1b

Calcaneal Osteomyelitis with Persisting Negative X-Rays and Blood Tests. Journal Of Case Reports: Clinical & Medical. 2019; 2(3):137.

Figure 2a

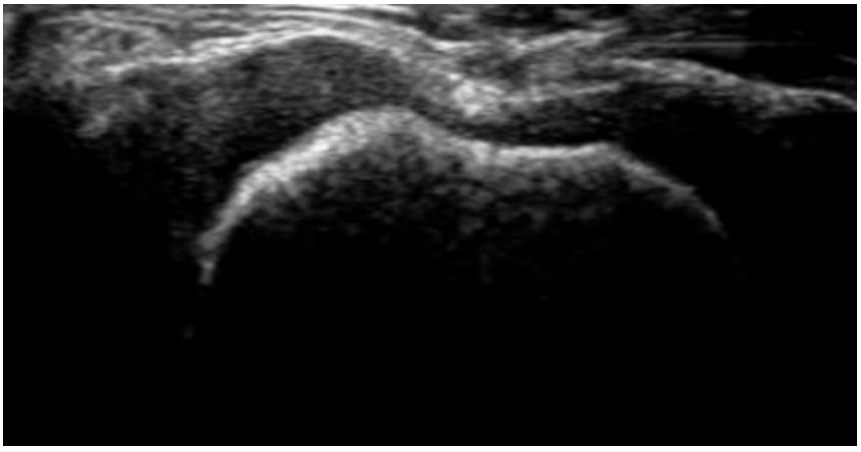
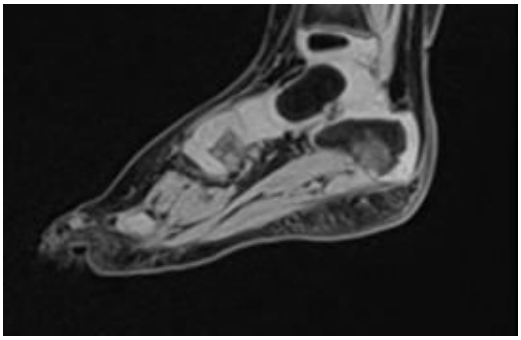


Figure 2b



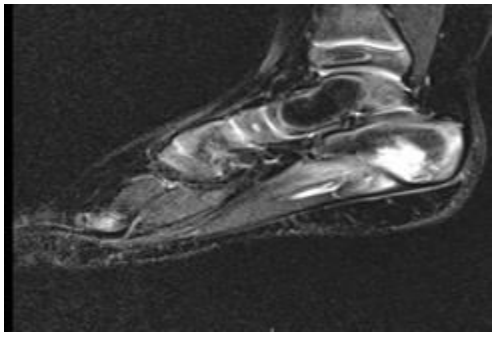


Figure 3a

Figure 3b

Figure legends: Figure 1 and 2. Negative calcaneal X-Ray at the first and second (1a and 2a, respectively) evaluation in the ER. Normal ultrasonography at first clinical evalutation (1b) and swelling of pericalcaneal soft tissues on second ultrasonography (2b). Figure 3. Calcaneal MRI showing calcaneal osteomyelitis on T1 (3a) and T2 (3b) alterations.

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DISCUSSION

We described a case of calcaneal osteomyelitis with a delayed diagnosis do to the subtle clinical presentation. In particular, the persisting negative blood and particularly the consecutive negative radiological tests made the diagnosis difficult and made this case unique on this regard. The final diagnosis and proper treatment were achieved only after 10 days of illness, when already a pediatrician and two orthopedics visited the patient without performing an adequate diagnosis, inflammatory osteitis was the initial diagnosis. Calcaneus osteomyelitis is an unusual infection in children (about 3-10% of all pediatric osteomyelitis) [3-6]. Compared with other types of osteomyelitis, the symptoms and signs of calcaneal osteomyelitis are often rather mild and insidious, which can cause a delay in diagnosis and treatment and potential long term consequences, such as [1,2] calcaneal deficit, resulted in an apropulsive and unstable gait due to loss of the attachment of the Achilles tendon (art reconstruction). The typical signs are local tenderness, swelling, erythema and difficulty in weight bearing, which is usually described as the "heel up" sign (the child rests their ankle over the opposite knee, even while sleeping) [7]. Nevertheless, these signs and symptoms may be due to other conditions, as happened in our case when inflammatory osteitis was initially diagnosed and treated with non-steroidal anti-inflammatory drugs. The diagnosis of calcaneal osteomyelitis may be supported by an increase in leucocyte count and inflammatory markers, which are described to be raised in 13-45% and 22-77% [8-11] cases. It is interesting to note that in our case inflammatory markers persisted negative during all the disease course, adding another difficulty to the clinician. X-rays remained negative on day 10 of disease and also during post-treatment follow-up, up to day 30 from disease onset. This is an unusual finding since radiographic changes have been described to appear on about day 7 of disease [8]. For this reason, 2nd level radiographic studies are necessary when a clinical diagnosis is suspected. A retrospective study of pediatric osteomyelitis involving 156 patients showed bone scintigraphy and MRI to be the most useful imaging modalities at the onset of symptoms [12]. A study of 213 patients comparing bone scintigraphy with MRI revealed that a proper diagnosis was obtained in 84% of cases with scintigraphy alone, nevertheless 47% of cases relied on MRI to guide treatment [13]. Normally, bone marrow appears bright on T1-weighted images due to the fat content. However, an infiltrative process such as osteomyelitis replaces the fatty marrow and decreases the T1 signal. The same area in question will appear bright or hyperintense on T2-weighted fat-saturation and STIR images due to the fluid and will typically enhance with gadolinium due to increased vascularization [14]. The treatment in recent years has shifted toward shorter antibiotic courses [6]. A recent trial [15] showed that the treatment should include a brief intravenous phase of an effective antibiotic (eg, clindamycin or cephalosporin), completion of the course orally to no longer than 20 days in uncomplicated cases [6,16]. Surgery can often be reserved for patients with a major delay in presentation and/ or those without a response to conservative treatment.

CONCLUSION

Calcaneal osteomyelitis is a difficult diagnosis which is easily missed in routine clinical practice, due to subtle clinical, laboratory and radiologic studies. Our case highlights these difficulties, since it presented with persisting negative and radiologic results during all the disease, a unique description in the current literature. Therefore, clinical findings and a high index of suspicion are the most important tools for the emergency doctor to achievea correct and rapid diagnosis. Furthermore, in the second line, imaging such as MRI may be required to rule out possible disabling condition in patients in whom definite diagnosis is not reached after primary assessment in any case of clinical suspicion.

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