

Osteoid osteoma in a 1-year-old boy—a case report

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A 1-year-old boy had been treated for a respiratory syncytial virus infection at the age of 4 weeks; otherwise his past medical history was unremarkable. Starting at the age of 7 months, the boy had been restless and showed signs of pain at night but not during the day. He presented to the family doctor with a common cold, raised temperature, and pain in his left leg which was externally rotated. The child had refused to weight bear on his left leg for several days. Treatment with an antibiotic resulted in reduced temperature, but had no effect on the pain; nor did regular treatment with paracetamol. The boy was referred to a pediatrics department for further evaluation.

On admission 6 days later, the boy still refused to bear any weight on his left leg. The left distal leg and foot were thinner, but without any signs of warmth or erythema. There was normal range of motion of the left hip and knee and there was no neurological deficit. C-reactive protein (CRP) was 8 (ref < 5 mg/L) and his temperature was 37.2°C. He was given ibuprofen and paracetamol. No acetyl salicylic acid was given at this time, and none later.

8 days later, the child got worse with severe pain in his left leg and a temperature of 40°C, but without other symptoms. The left distal thigh was now substantially swollen and the boy did not move his foot. CRP was still normal and the erythrocyte sedimentation count was 20 mm. Even though the infection parameters were all normal, osteomyelitis was suspected. Treatment with cefuroxim was started after negative blood culture. Radiological evaluation was consistent with several diagnoses such as Ewing's sarcoma, osteomyelitis, Langerhans cell histiocytosis and osteoid osteoma (Figure 1). The patient was admitted to our service 26 days after the onset of symptoms, with persistent pain but with no fever. The left femur was 1 cm longer, as estimated by radiographs. An intramedullary lesion was identified under fluoroscopic control

and an open biopsy was performed to secure samples for culture and patho-anatomical diagnosis. Culture was negative and the histological examination showed osteoid osteoma.

Directly after surgery, the boy appeared more active but after 1 week the pain and the inability to bear weight returned and the boy again had to be treated daily with analgetics. A new CT scan under general anesthesia was performed and showed that approximately half of the nidus still remained (Figure 1). The boy underwent a radiofrequency ablation 1 month after biopsy (Figure 2). The pain disappeared immediately. At follow-up 10 weeks later, the boy had no limp. 6 months after the ablation the boy was still pain-free, no leg length discrepancy could be found and he walked and ran normally.

Radiology (Figures 1 and 2)

An initial radiograph of the left leg 18 days after the start of symptoms showed a solid lamellar periosteal reaction around the diaphysis and distal metaphysis. Centrally in the metaphysis, there was an unspecific sclerosis. MRI showed an ill-defined extra- and intraosseal edema, but no extraosseal tumor component. The latter finding made Ewing's sarcoma less likely, limiting the differential diagnoses to osteomyelitis, Langerhans cell histiocytosis or osteoid osteoma. CT showed a 1.2-cm area of sclerosis with a central nidus intramedullary nidus close to the inner surface of the cortex in the distal femur.

The CT after biopsy showed a rest of the nidus. At follow-up 6 months later, a radiographic check showed reduction of the periosteal reaction.

Discussion

Osteoid osteoma is most common in the second decade of life. Only 3–8% of patients are younger

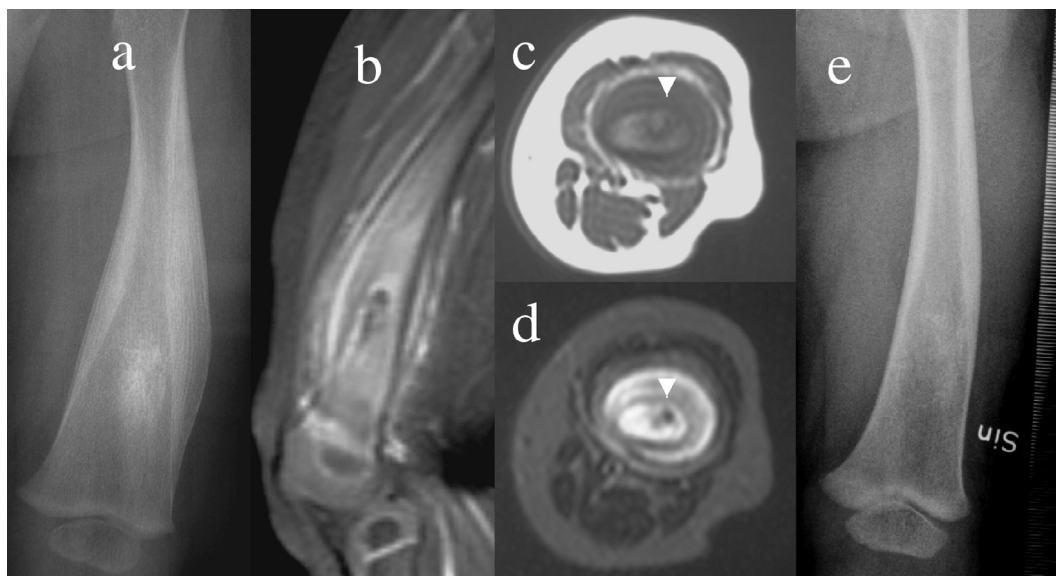


Figure 1. AP radiography of the left femur at onset of symptoms (panel a). There was a marked expansion of the diaphysis and metaphysis due to a solid lamellar periosteal reaction. In the bone marrow there was an area with an irregular sclerosis. Sagittal (panel b, fat suppressed CE-T1W) and transaxial MR sections (panel c, T1W, and panel d, T2WFSE). There was a marked ill-defined intra- and extraosseal edema involving the diaphysis and distal metaphysis. There was no tumor. Note the nidus-like lesion in the bone marrow (arrowhead). 6 months after radiofrequency ablation, there was almost complete restoration of the bone structure (panel e).

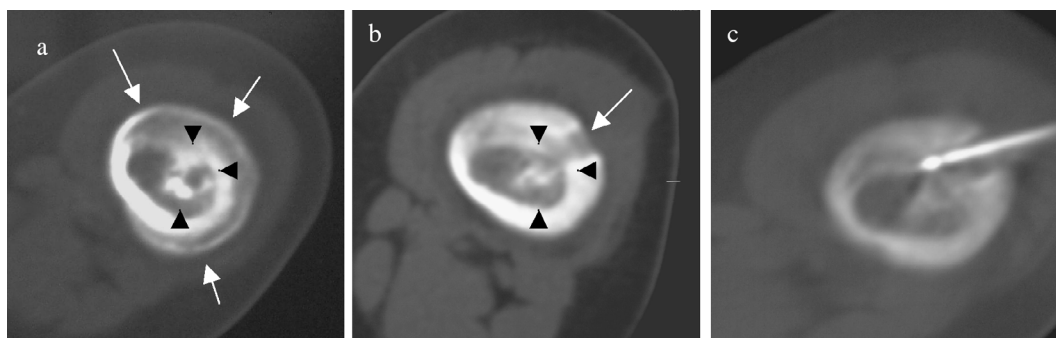


Figure 2. Transaxial CT scans in the same location of the distal femur on 3 different occasions. The initial examination showed a nidus-like lesion surrounded by an irregular sclerotic bone (panel a, arrowheads). There was a marked periosteal reaction around the metaphyseal cortex (arrows). Panel (b) shows a CT section performed after open biopsy. Comparison with the initial CT showed that the nidus had not been completely removed during surgery (arrowheads). The biopsy canal is seen laterally in the cortex (arrow). Panel (c) shows a CT section to check the position of the needle during radiofrequency ablation.

than 5 years (Kawebulum et al. 1993a). 1 case of histologically confirmed osteoid osteoma in an infant, an 8-month-old boy, has been reported (Haberman et al. 1974). The younger the child is, the easier it is to be misled clinically, and imaging features are also more likely to be unspecific (Kawebulum et al. 1993b). In our case, the most prominent symptom was pain and unwilling-

ness to bear weight. Pain and limping are the two most common symptoms of osteoid osteoma and have been found in two thirds and nine tenths of patients, respectively (Kawebulum et al. 1993a). The same authors also found that about half of their patients with osteoid osteoma in the lower extremity had muscular atrophy and 1 in 5 had a leg length discrepancy.

As our patient also had high fever and no clinical effect of NSAID, osteomyelitis was initially considered to be the most probable diagnosis. Neither radiographs nor MRI were diagnostic. Several other authors have described the difficulty in verifying osteoid osteoma in young children (Kawebulum et al. 1993b, Thiagarajan et al. 1996, Bhat et al. 2003). When radiography is inconclusive, further investigation with thin-slice CT (which requires general anesthesia in such small children) is necessary to establish a reliable diagnosis.

Surgical excision of osteoid osteoma has been the preferred treatment, even though there have been some reports of cases with spontaneous remission (Leicester et al. 2001). Radiofrequency ablation is as effective as operative excision of osteoid osteoma in an extremity and, in contrast to surgery, is minimally invasive, safe and obviates the need for hospitalization (Rosenthal et al. 1998, Woertler et al. 2001). To our knowledge, this boy is the youngest child to have been treated with radiofrequency ablation.

Contributions of authors

WE: Case study, research and text. OB: supervisor and review of manuscript. VS: assessment of radiographs and radiology text.

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