Acta Orthop. Belg., 2009, **75**, 554-556

CASE REPORT

Haematogenous osteomyelitis of the patella in a child

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Osteomyelitis of the patella is rare ; it essentially occurs in child age. The diagnosis is difficult because of its variable presentation ; it should always be considered in patients with persistent peripatellar pain and swelling. This paper reports one case of haematogenous osteomyelitis of the patella not associated with septic knee arthritis. The identification of the organism was performed by the injection-aspiration fluid technique. Treatment is identical to the treatment of osteomyelitis at other locations. The literature is also reviewed and discussed.

Keywords : patella ; osteomyelitis ; children ; infection.

INTRODUCTION

Osteomyelitis of the patella is an uncommon condition which seems to be limited to children. Since 1829 when Thirion, from Belgium, reported the first case (*10*), less than 100 cases have been described in literature. Involvement of the patella has rarely been reported in large series of bone and joint infections, and has been reported essentially as case reports (*1-6,8,11*).

CASE REPORT

A 10-year-old white boy without a history of injury or recent infection started complaining of pain in his left knee. One day later, he was unable to walk, his temperature was 39° C and he vomited several times. Physical examination in the emergency room revealed a hot, red and slight swelling over the anterolateral part of the patella. Mobilisation of the knee was impossible because of pain, but no joint effusion was present. The white blood cell count (WBC) was 11600/ml and the C-reactive protein (CRP) level was 10 mg/L. Radiographs made at that moment showed superior-lateral rarefaction in the patella (fig 1). Computed tomography (CT) scans confirmed the bony destruction. Under general anaesthesia, joint aspiration was performed and revealed a sterile effusion with negative cultures. Furthermore, a patella aspiration was also performed because the joint liquid looked normal. The technique is simple. We used a 0.2 cm trephine, which was driven into the lesion with fluoroscopy guidance. The bone specimen was sent for histological analysis. Through the same trephine in the same position, 2 ml sterile saline was injected and subsequently aspirated and was sent for bacteriological culture in a blood-culture vial.

Microscopic study of the patellar bone specimen showed no anomalies suggesting a diagnosis of

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No benefits or funds were received in support of this study

Fig. 1. — Radiograph of the left knee. AP view : superolateral bony destruction of the patella. Lateral view : lytic lesion of the patella.

osteomyelitis. However, *Staphylococcus aureus* was grown from the culture of the patella aspiration. The patient was subsequently treated with 10 days of intravenous Rifampicin and Cloxacillin followed by 6 weeks of oral antibiotics (Rifampicin and Clindamycin) and the limb was immobilized in a long leg cast for 6 weeks. Although the patient showed no restriction of joint motion or activity at two months, radiographs showed fragmentation and modification of the shape of the patella.

DISCUSSION

The patella ossifies between 3 and 6 years of age and the ossification centers completely fuse at the age of 18. Shim and Leung (*9*) described the vascular anatomy of the patella. The rich vascular network, added to the absence of a physeal plate, may account for the rare occurrence of haematogenous osteomyelitis in this location (*7*). Vascularisation of the patella reaches a maximum at 12 years of age ; haematogenous osteomyelitis is thus most common between the age of five and twelve as reported in most of the cases (*1,2,4,5,6*).

The spread of the infection is uncommon when the child is young ; the thick cartilage layer behind the ossifying part resists penetration. Sterile effusions of the knee joint were present in most of the reported cases and seemed to be reactive to the disease of the patella. As the child grows up, the cartilage-bone ratio tends to diminish and complicated purulent arthritis may develop (*3,8*). However, when suppuration occurs, the pus usually points anteriorly (*1,4,5*), mimicking a prepatellar bursitis (*2*).

An important feature of this condition is that diagnosis is frequently delayed because of its rarity and variable presentation. Patellar osteomyelitis can be misdiagnosed as septic arthritis, synovitis, septic bursitis or peripatellar cellulitis. Furthermore, direct trauma can play a role in the aetiology of osteomyelitis even without a break in the skin (*2,7*).

According to the cases reported, clinical findings are not specific. The pain localised around the patella may be mild or severe, causing a limp or restriction of motion. Peripatellar swelling may be minimal or marked. Local inflammatory signs are not always present. Laboratory findings show a high leukocyte count and elevated CRP level. Plain radiographs may be normal or reveal soft tissue swelling in the prepatellar area. Bone destruction and sclerosis occur later. A lytic lesion may be suggestive of a Brodie's abscess. CT scans confirm the bony changes. Magnetic resonance imaging (MRI) provides information in support of the diagnosis of osteomyelitis, and also shows the extent of the surrounding soft tissue involvement. Because clinical examination is difficult and standard radiographs may be normal, we recommend the routine use of CT scan or MRI scan after gadolinium injection.

Aspiration of the patella or prepatellar bursa for Gram stain and culture provides the best opportunity to retrieve a specific organism. *Staphylococcus aureus* is the most common infecting organism, as in our case (*1,4,5,7,11*). Other pathogens such as *Streptococcus* (*11*), *Escherichia coli* (*5*) and *Clostridium bifermentans* (*8*) have also been reported. The treatment includes organism-specific antibiotics until there is a clinical improvement and a drop in the CRP level. Surgical debridement and curettage may sometimes be needed to remove purulent necrotic material or a sequestrum (*2,5,6,11*). Nevertheless, some authors have reported good result without any surgical debridement (*1,4*), as in

our case. None of the papers give specific indications as to the need for and the optimal duration of immobilisation and avoidance of weight-bearing. In our case we suggested 6 weeks of partial weight-bearing with the protection of a long-leg cast.

In conclusion, osteomyelitis of the patella is an uncommon infection and the diagnosis is difficult because of variable presentations. It should always be considered in patients with persistent peripatellar painful swelling. In the case presented, the diagnosis was made by aspiration of saline injected into the patella. Neither microscopic analysis of the curetted tissues nor joint aspiration could confirm the infection.

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