Acta orthop. scand. 47, 566–569, 1976

# HAEMATOGENOUS OSTEOMYELITIS OF THE PATELLA

*Report of Three Cases*

J. VANINBROUKX, M. MARTENS, M. VERHELST & J. C. MULIER

University Hospital, Department of Orthopaedic Surgery, K.U.L., Pellenberg, Belgium.

Three cases of osteomyelitis of the patella are reported. One presented as an acute septic arthritis and another developed a sterile arthritis despite antibiotics. The clinical signs, diagnosis and treatment are discussed. Treatment with rest and antibiotics failed to cure the disease. In all three cases a sequestrectomy was carried out resulting in healing of the affected patella and recovery of knee mobility.

*Key words:* haematogenous osteomyelitis; patella; septic arthritis; sequestrectomy; antibiotics

Accepted 30.vi.76

Acute osteomyelitis of the patella is a very rare condition and is especially atypical under the age of five.

In this paper three cases of osteomyelitis of the patella are reported. The atypical course of the condition, the clinical signs and the treatment are discussed.

## CASE REPORTS

*Case 1*

A 3-year-old girl developed a painful swollen knee and fever (38° C). Conservative treatment consisting of oral antibiotics was started and the affected leg was immobilized. Several knee aspirations were carried out, revealing an opaque fluid which remained sterile on culture but this was attributed to the antibiotic treatment. Initial X-rays of the knee were negative. Repeat X-rays revealed only diffuse osteoporosis of the knee. Because of the persistent picture of arthritis of the knee with high temperature, despite antibiotics, and the toxic symptoms, the child was referred to our department.

On admission, examination showed a warm swollen knee and synovial hypertrophy. There was tenderness over the patella and a limited and painful flexion. Tender glands in the groin were observed. Sederate was 152 after 1 hour. WBC count was elevated to 16,000 and mild anaemia was present. X-rays now revealed necrosis with fragmentation and sequestration of the bony nucleus of the patella (Figure 1).

The diagnosis of osteomyelitis and secondary arthritis of the knee was made and an arthrotomy was carried out. The synovial tissue was hyperaemic and hypertrophic. The cartilage of the patella was ulcerated (Figure 2). A large sequestrum of the bony nucleus of the patella was removed and the knee joint was drained.

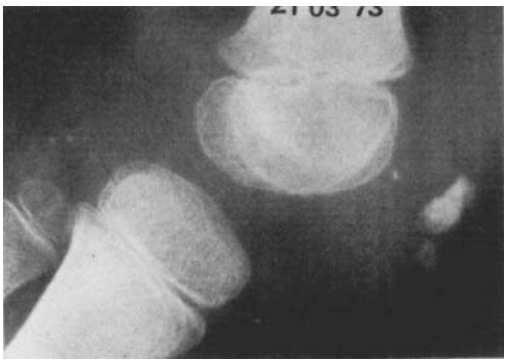

*Figure 1. Necrosis and sequestration of the bony nucleus of the patella (Case 1).*

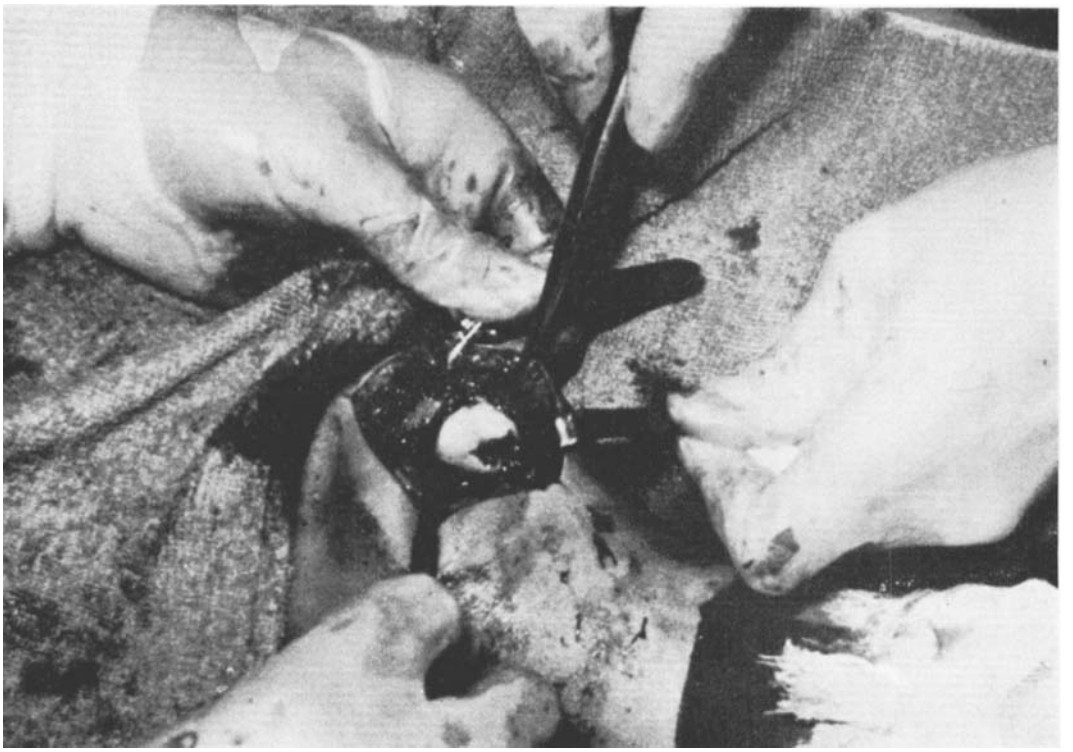

*Figure 2. Ulceration of the cartilage through which the osteomyelitis drained into the joint (Case 1).*

The synovial layer was closed and a subcutaneous drain was placed in the wound.

Histology showed necrotic bone with granulation tissue. Postoperatively, antibiotics were given and a knee exercise program was started as soon as the wound had healed. The postoperative evolution was uneventful. The signs of local inflammation subsided and knee function was regained.

Follow-up X-ray examinations showed a further ossification of the patella (Figure 3).

*Case 2*

A 6-year-old boy complained of pain in the right knee especially at night. There was no history of trauma. There was a slight rise in temperature on admission 3 weeks after the onset of the complaints but no local signs of acute inflammation in the knee or prepatellar bursitis were observed. The patella was very tender and knee flexion painful and restricted. Biochemistry values were within normal limits. X-rays revealed an osteolytic zone with a sclerotic border in the proximal part of the patella (Figure 4). The diagnosis of low grade osteitis of the patella was made. Conservative treatment with antibiotics and rest yielded an initial improvement for about a week. There was, however, a recurrence of the complaints and the fever despite this treatment necessitating a surgical exploration. The knee joint was not opened. A sequestrum in the patella was removed.

Histology demonstrated dead bone with chronic inflammation. Culture of the tissue removed was negative. The postoperative course was uneventful and normal knee function was regained.

*Case 3*

A 5-year-old boy presented with a 3-month history of pain in the knee, especially at night. There was no history of trauma, and no fever during the course of the disease. The X-rays 2 months after the onset of the complaints revealed an osteolytic zone with a sclerotic border and dense centre in the proximal patella. Despite treatment with antibiotics the symptoms remained. He developed tenderness and swelling on the patellar surface, knee effusion and a pronounced quadriceps wasting. Knee flexion was slightly restricted because of pain.

*Figure 3. Ossification after 9 months (Case 1).*

*Figure 4. Lateral view showing the osteolytic zone with sclerotic outline (Case 2).*

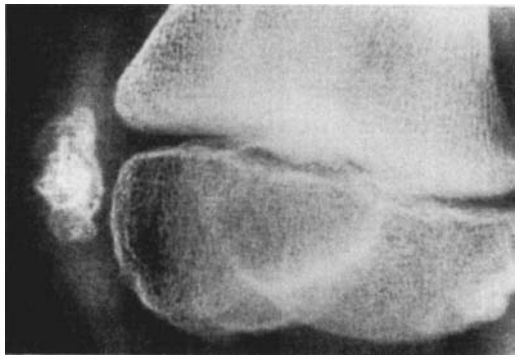

*Figure 5. A dense sequestrum with an osteolytic outline (Case 3).*

Repeat X-rays after 2 weeks showed a slightly increased osteolytic zone with a dense sclerotic centre (Figure 5). Because the symptoms did not respond to conservative treatment with high doses of antibiotics an exploration was performed.

At surgery the bony nucleus of the patella was curetted from the upper surface leaving the cartilage intact. Histological examination revealed dead bone trabeculae and a lymphocytic and plasmocytic infiltration. The function of the knee was regained slowly as the signs of local inflammation regressed.

## DISCUSSION

Most of the cases of osteomyelitis of the patella have been reported in children between the ages of 5 and 15. Moore (1938) suggested that this could be explained by the fact that before the age of five the patella is largely cartilaginous. The ages in our cases were 3, 5 and 6 years. In about half of the reported cases an injury is mentioned. In our first case there was a definite injury prior to the onset of the complaints.

An uncommon feature in one of the cases was the initial presentation as an arthritis of the knee joint. In case 3 a sterile reactional synovitis developed; case 2 at no stage presented an effusion. There is a thick layer of cartilage behind the ossifying focus of the patella, protecting the knee joint. On the other hand, the strong layer of fibres of the patellar

tendon covering the outer surface of the patella may represent an even stronger barrier for abscess formation to perforate and become more superficial. In none of the three cases was prepatellar bursitis present, in contrast to Evans' report (1962). In case 1, although the outer cortex of the patella was perforated, the overlying fibres were not, so that drainage to the more superficial structures was not possible. This may explain the resulting septic arthritis of the knee which was due to a breakdown of the articular cartilage and drainage of the pus into the knee joint. The clinical signs were those of an acute arthritis of the knee, although the X-ray remained negative for 3 weeks.

In all three cases an accurate diagnosis and suitable treatment were delayed because the condition is rare and it presented in an atypical manner. According to the literature the usual organism found is *staphylococcus aureus* although occasionally *streptococcus* is cultured. Reports have been published of tuberculosis, syphilis and mycosis of the patella. In our three cases no organisms were cultured from the aspiration fluid, sequestrum or the synovial tissue but treatment with antibiotics had been initiated at this stage.

The treatment program of the cases reported in the literature is not uniform; in a few cases the condition was cured with rest and antibiotics. In other cases a sequestrum was removed. Our trial with initial conservative treatment, consisting of antibiotics and rest, was unsuccessful in all three cases so that operative treatment was performed with removal of the sequestrum. In case 1 a large sequestrum was removed, representing the whole bony nucleus of the patella. Further ossification seems to develop normally but the patella is larger than the contralateral one. The postoperative course was uneventful and full recovery of knee function was achieved in all cases.

## REFERENCES

Evans, D. K. (1962) Osteomyelitis of the patella. *J. Bone Jt Surg.* **44**-B, 319–323.

Moore, T. (1938) Acute osteomyelitis of the patella. *Lancet* i, 552–553.

Correspondence to: M. Martens, M. D. University Hospital, Weligerveld 1, 3041 Pellenberg, Belgium.