Acta orthop. scand. 45, 111–118, 1974

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OSTEOCHONDRITIS DISSECANS OF THE PATELLA

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Accepted 24.v.73

Osteochondritis dissecans of the patella is rare. Individual cases have been reported (Carnevale 1953, Cattaneo 1965, De Palme 1954, Heywood 1961, Hutchison 1943, Kleinberg 1949, Marique 1952, Rombold 1936, Schroder 1957, Schultz 1933, and Watson-Jones 1955). Almgård et al. (1964) reported 2 cases, Lavner (1947) and Pantazopoulos (1971) 4 each, Aichroth (1971) 5, Bauer (1967) 7, and Smillie (1960) 13 cases, 4 or which were bilateral. A bilateral occurrence has also been reported by Burns (1959), Hay (1950), Kleinberg (1949), Mageira (1970), Redlich (1969), and Robert & Huges (1950).

Simultaneous involvement of other bones has been described by Hay (1950), Robert & Huges (1950), Smillie (1960), and Watson-Jones (1955). Most of these cases have been published at the time that they occurred and therefore without any major follow-up period. It therefore seemed justified to submit the present material, with special references to late complications.

MATERIAL

The material comprises 7 males and 3 females out of approx. 400 patients who applied to the Orthopaedic Hospital, Copenhagen, during the decade 1950–59 with disorders of the knee which were diagnosed as osteochondritis dissecans, osteochondrosis, chondropathy, or chondromalacia of the patella.

The age at onset of symptoms ranged from 12–21 years, and 6 patients were in the age range 12–14. The majority presented within the first year after the onset of symptoms, but in 2 cases 2 and 3 years had elapsed.

A family history was elicited in the case of a 12-year-old girl with bilateral changes (Figure 1) whose father had osteochondritis dissecans of both elbows and knees. None of the patients had osteochondritic changes of other joints.

A 14-year-old boy had coxitis of the contralateral hip and had been treated by arthrodesis before the complaints in the right knee started; these were not preceded by trauma. A 14-year-old girl presented primarily with pain in the right knee. X-rays of the right hip revealed a slipped epiphysis at the femoral head, and it was not until epiphysiodesis on the hip had been performed that the osteochondritis

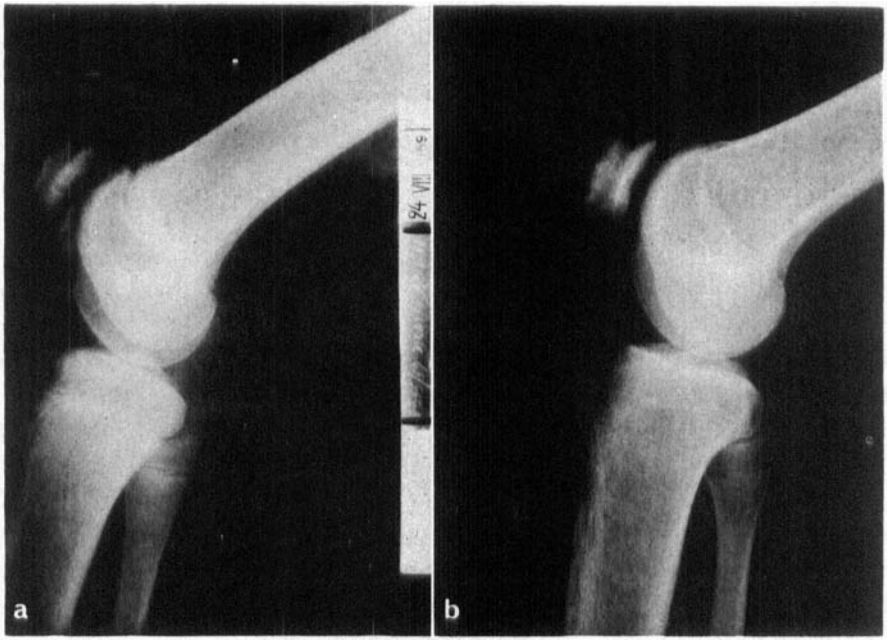

Figure 1. a. X-ray of the right knee of a 12-year-old girl. In the lower half of the patellar joint surface a rounded defect and a fragment. Similar changes were found in the left knee.

b. The same knee 10 years later, showing a faint hollow at the site of the previous defect.

of the homolateral patella was diagnosed. The other 8 patients had no associated diseases.

In 5 cases there was a history of trauma, possibly direct to the knee.

Symptoms: Diffuse pain in the knee joint in all cases. Often the pain would be aggravated on weight-bearing with flexed knee, and then localized more precisely to the patella. Four patients had noticed transient swelling after exertion. One patient complained of weakness in the knee. Three patients had episodes of locking, possibly due to loose bodies (which were demonstrated at operation in 4 of the cases).

Signs: Three patients had effusion in the joint. There was no limitation of motion or instability. In 4 cases there was severe retropatellar crepitation accompanied by pain in one of the cases. Atrophy of the quadriceps muscle was present in 4 cases, amounting to 1 cm in 2 cases, 2 cm in one case, and 3 cm in one case.

RADIOGRAPHIC CHANGES

X-rays revealed in all cases an osteochondritic lesion in the patella, most clearly in the lateral view, more rarely in tangential views, and only in one case in the anteroposterior view.

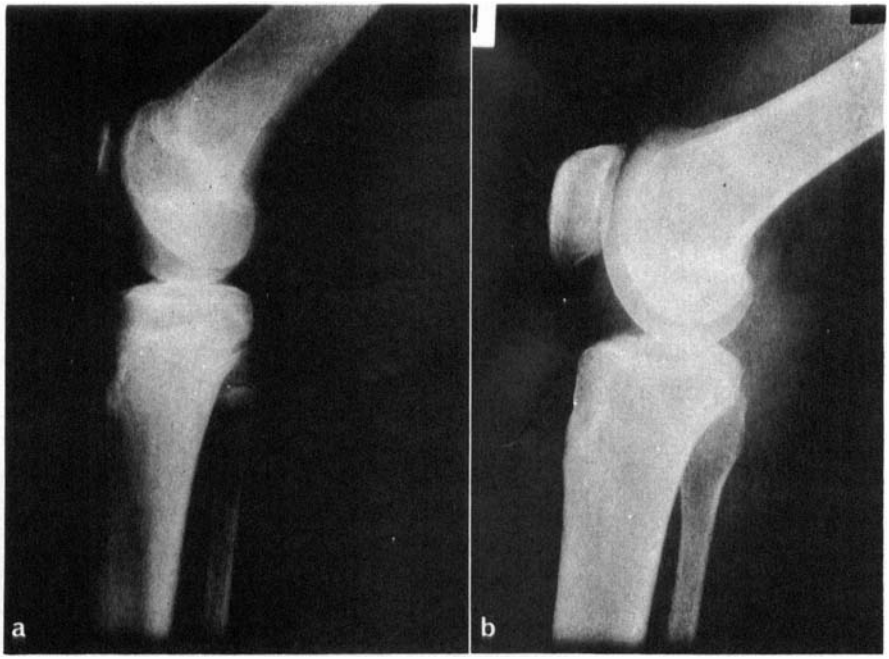

Figure 2. a. X-ray of the right knee of a 14-year-old girl showing a large, irregular defect proximally in the patella.
b. The same knee, 10 years later, showing the same defect proximally and moreover exostoses.

In all cases the lesion was situated in the cartilage-lined part of the patella. It was not always possible to locate it to the medial or lateral joint surface, but when considering also the operative findings, such a localization was possible except in 2 non-operated cases. In 2 cases the lesion was proximally situated; laterally in one (Figure 2), not accurately located in the other. In one case it was in a central situation. Eight cases were distally situated, 6 medially, one centrally, and one of uncertain situation. The size of the defect was best assessed in the lateral view in which the height of the joint surface was about 40 mm. In 2 cases the defect was 5 mm in height, in 2 cases 10 mm, in 6 cases 15 mm, and in one case 25 mm (Figure 3), i.e. involving from one-eighth to one-half of the patellar joint surface in the lateral view. The depth of the osteochondritic lesion was from 2–4 mm, but the deepest lesion involved the entire upper lateral quadrant of the patella, continuing through the entire patella to the anterior cortical membrane. In 5 cases there was a fragment in the defect, in one case 2 fragments

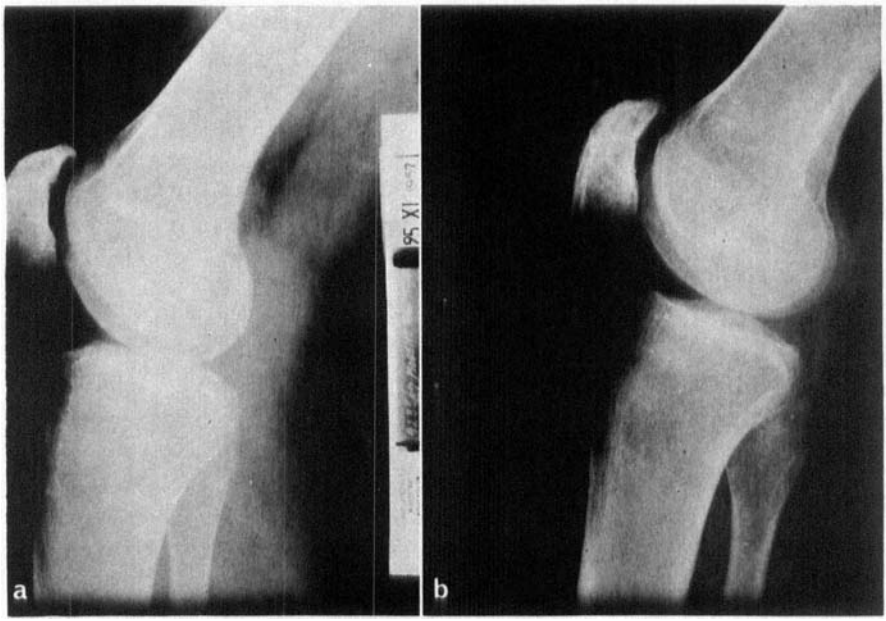

Figure 3. a. X-ray of the right knee of a 16-year-old boy showing an irregular defect, incipient formation of exostoses, and sclerosing of the patella as well as mild changes on the femoral surface of the patella.
b. The same knee, 14 years later, showing some smoothing of the edges, but increasing exostoses proximally on the patella.

(Figure 4), and in 4 cases a loose body in the suprapatellar pouch. No radiographic changes were found in the femur or tibia in any case.

TREATMENT

Pain, locking incidents, and the demonstration of loose bodies were the factors of most importance in deciding upon operative treatment. In 3 instances these complaints seem to have been so modest that no treatment was instituted, even though these 3 cases included the one with the largest defect. Eight patients underwent operation consisting of removal of a loose body and curettage of the lesion.

In 5 cases moderately severe cartilaginous degeneration was found on the patella, in one case mild changes on the femur. In 3 cases the synovial membrane was thickened, purple, and with an increased vascular pattern. The postoperative course was uneventful in all the cases. After-treatment was in 5 cases the ordinary regimen used after

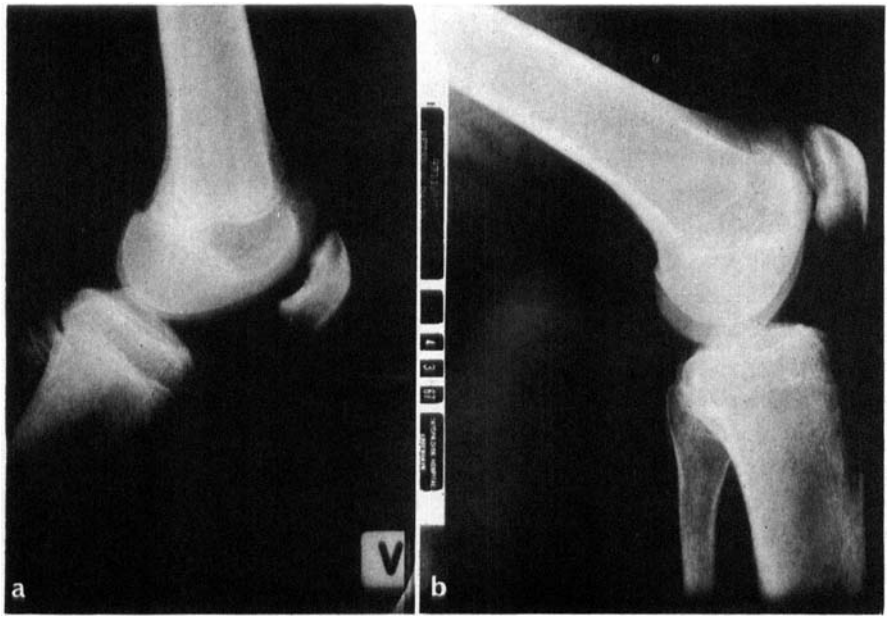

Figure 4. a. X-ray of the left knee of a 14-year-old boy showing a large defect in the lower half of the patella and at least 2 fragments in the defect.
b. The same knee, 10 years later, showing smoothing of the defect, exostoses at the apex of the patella and some sclerosis.

operations on the meniscus with active movements a few days after the operation. Three cases were treated by non-weight-bearing and a posterior splint for 4 weeks.

FOLLOW-UP

Nine out of the 10 patients (the 10th was living abroad) were seen at follow-up, including radiographic examination, 8–18 years after the primary investigation.

All the patients were then working, but 4 of the males had been rejected for military service because of their knee disorder.

Four patients reported no symptoms. Three had periodical pain in the knee joint on exertion and complaints on flexion for a long time. The latter complaint was present also in the patient with bilateral involvement. One patient had a tendency to swelling of the knee joint. There were no cases of locking incidents.

Three patients had a feeling of weakness and instability in the joint.

Four complained of tenderness of the patella on pressure and after minor traumas.

Physical examination revealed in 8 cases unmistakable, marked retropatellar crepitation, and 5 of these patients felt severe pain during this examination. Only 2 patients had femoral atrophy of 2 and 3 cm respectively.

X-rays showed changes at the site of the osteochondritic lesion in all cases, least marked in the female patient with bilateral involvement (Figure 1). In her case there was only a faint hollow on a level with the previous affection. The remaining 8 had a major or minor defect, as a rule with a smooth base and rounded edges. In two cases the lateral view displayed a somewhat undulating surface. The case with the largest defect (Figure 3) still showed distinct changes involving the proximal two-thirds of the patella, with an irregular base, somewhat smoothed edges, and exostoses along the patellar margin. In the crater there were 2 small fragments. The bone profound to the defect was sclerosed.

Exostoses along the patellar margin were found in 7 cases. Exostoses of a size of 1–2 mm were found proximally in 3 cases, distally in 5, medially and laterally in 2 each. In 3 instances the exostoses were from 2–4 mm. The bone profound to the defect showed, as already mentioned, some sclerosis, most marked in the case with the large defect, less marked in 3 cases.

In one case there were irregularities of the femoral joint surface facing the patella. Two cases exhibited mild arthritic changes in the femoro-tibial joint.

Owing to the small number of cases, no attempt was made to compare the late results in non-operated and operated cases. It may be mentioned, however, that the 2 cases showing the most marked exostoses on the patella were among the non-operated ones.

DISCUSSION

Osteochondritis dissecans of the patella occurs around puberty, in the present material perhaps somewhat later than similar changes elsewhere in the knee joint and in the elbow. The question concerning a traumatic origin cannot be decided on the basis of the present material.

The diagnosis was made most accurately on the basis of the X-ray films, although locking incidents, a palpable loose body, and simultane-

ous retropatellar crepitation and pain during the examination had given rise to a suspicion.

The radiographic changes were pronounced, showing bone defects of the joint surface from 5–25 mm on the lateral view, and usually localized distally and medially. This is in keeping with Smillie's findings (1960), whereas a number of others, *int. al.* Pantazopoulus (1971) have found the lesions to be localized laterally.

Differential diagnostic problems consist of bipartite patella and osteochondral fracture. The former is usually painless, the changes are in most cases localized in the upper lateral corner of the patella and do not give rise to the formation of loose bodies. A fracture presupposes an adequate trauma, possibly with haemarthrosis. Acute operation will show a fresh fracture surface. In older cases it may be impossible to distinguish between the two conditions.

Treatment was operative in 8 cases. No conclusions will be drawn concerning the treatment. However, it may be stated that Almgård et al. (1964), among others, found less favourable results in cases where the operation included curettage of the crater.

Follow-up after 8–18 years showed radiologically visible changes of the bone. In most cases the defect had rounded edges, but exostoses on the patella had appeared, most often distally, as well as sclerosing of the bone profound to the defect. In 3 cases changes were found in other parts of the knee joint. The finding of retropatellar crepitation at follow-up in 8 cases and pain during that examination in 5 cases would seem to indicate intra-articular changes.

It must be concluded, therefore, that in addition to the acute symptoms, an osteochondritic lesion of the patella most often gives rise to persistent radiological changes, in some cases possibly incipient osteoarthritis.

In addition, a number of the patients have major or minor symptoms and signs.

SUMMARY

A material of 10 patients with osteochondritis dissecans of the patella is submitted. The condition was bilateral in one case. The defect visible on the X-ray films was large and usually localized in the medial part of the patella. At follow-up 10–18 years later there were still radiological changes of the patella and in some of the patients incipient arthritic changes.

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