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POPLITEAL CYST

A follow-up study on 42 operatively treated patients

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It is generally known that popliteal cysts may develop in conjunction with both extra- and intra-articular diseases of the knee region. Adams (1840) observed a mass in the popliteal space in patients with rheumatoid arthritis (RA), and Baker (1877) found synovial cysts in patients with knee joint disease.

In an investigation on cadavers, Wilson et al. (1938) detected a communication between the semimembranous bursa and the normal knee joint in about 50 per cent of cases. Later, several authors have noted that cysts tend to be associated with other abnormalities of the knee joint (Haggart 1938, Childress 1954, 1970, Burleson et al. 1956). Diseases of the knee may cause popliteal cysts, and, vice versa, gastrocnemius-semimembranosus bursitis may cause intermittent effusion of the joint.

Many authors have reported some cases of rupture of a popliteal cyst and formation of a dissecting giant cyst extending as far as the distal part of the calf, e.g. Dixon & Grant 1964, Burleson et al. 1956, Harvey & Corcos 1960, Tait et al. 1965, Perri et al. 1968).

In the present series of 42 operatively treated patients the value of extirpation of the cyst alone or extirpation in conjunction with some other procedure, usually synovectomy of the knee joint, was assessed.

MATERIAL AND METHODS

The series comprises 42 operatively treated patients, admitted for treatment to the Department of Orthopedics and Traumatology, Helsinki, University Central Hospital, and the Kivelä Hospital, Helsinki, from 1960 to 1971. Since 8 patients had bilateral cysts, the total number of operatively treated cysts was 50. Eleven cysts extended as far as the distal part of the calf (Figure 1). Four of these patients showed acute symptoms resembling those of acute deep thrombophlebitis. All patients with giant

Figure 1 a–b. A giant cyst on a 50-year-old rheumatoid patient. Synovectomy and extirpation of the cyst were carried out on the same occasion with a good result.

1 c. A side view of another giant cyst with a remarkable narrowing of the middle part of the cyst, which is lying under the tension of the popliteal fascia and the gastrocnemius muscle.

cysts were operated on within three months. Two patients had bilateral giant cysts.

Of the patients 25 were females and 17 males. 26 cysts were in the left, 24 in the right popliteal space. At the time of operation the age of the patients ranged from 22 to 71 years, the mean being 48 years. The age of the patients with giant cysts ranged from 37 to 66 years, the mean being 43 years. Nearly all cysts were operatively treated within twelve months from the time of the appearance of symptoms. Four patients had had almost symptomless cysts for many years. Symptoms such as a sensation of fullness, aching pain and limitation of motion were slight. The 11 giant cysts caused more acute pain and swelling.

Effusion of the knee joint was found preoperatively in 29 patients. In some patients it may have been intermittent. In 6 patients this symptom was less apparent, and 7 patients had no effusion. RA was diagnosed in 28 patients, osteoarthritis of the knee joint in 3 patients, osteochondritis dissecans with corpus liberum in one patient, torn posterior part of the medial meniscus in one patient. Two patients had a history of slight trauma.

Table 1. Associated diseases in 42 patients with popliteal cysts.

Associated disease	No. of cases	No. of patients
Rheumatoid arthritis	32	28
Osteoarthritis	4	3
Osteochondritis dissecans (loose body)	1	1
Torn meniscus	1	1
Total	38	33

Table 2. Type of surgery in 50 popliteal cysts.

Extirpation alone	38 (including 22 rheumatoid knee joints)
Combined with synovectomy and meniscectomy	10 (including 4 giant cysts)
Extirpation of medial meniscus	1
Extirpation of corpus liberum and shaving of cartilage	1
Total	50 cases (42 patients)

RA was diagnosed in 10 patients about one year before extirpation of the cyst, whereas 18 patients had RA of long standing. All giant cysts were present in RA patients. In 3 of these cases the duration of RA was under one year.

In 46 cases the cyst communicated with the joint. In 3 cases the communication was uncertain and in one case there was no communication. X-ray changes of the

knee joint were slight. In the rheumatoid cases osteoporosis and slight erosions in one-half of the cases were observed. Preoperative arthrography was made in half the cases, and the cyst could be demonstrated in all of these.

The cyst was totally excised in all cases. The communication within the joint was closed. In the patients with giant cysts the defect in the capsule was closed with fascia from the gastrocnemius-semimembranosus muscles. In ten patients with RA, synovectomy including meniscectomy was made at the same time. In 22 cases the cyst alone was excised. Extirpation of the medial meniscus and the cyst was done in one case, extirpation of the corpus liberum and shaving of osteochondritic foci of the medial femoral condyle in one case. In 4 patients with giant cysts synovectomy was carried out on the same occasion. In 7 cases the cyst alone was excised.

The cysts were invariably situated in the typical location in the medial part of the popliteal fossa, between the semimembranosus-gastrocnemius muscles. Vacuum was used in the synovectomized cases and in the calf after the extirpation of giant cysts. All operations of giant cysts and all synovectomies were done by the author. The remaining patients were operated on by other surgeons.

RESULTS

All patients were summoned to follow-up examination one to ten years (average three years) after the primary operation. Follow-up results were obtained in 42 patients. In addition to ordinary radiography, arthrography was made in 15 patients. Recurrence of the cyst was found in 6 patients, in one bilaterally. In this case osteoarthritic changes were present in both knees, and reoperation was not performed. In the

Figure 2. Moderate effusion and a large suprapatellar recessus of the knee joint at the follow-up, despite the synovectomy and extirpation of a giant cyst. Stretching of the posterior wall of the joint was demonstrated.

Figure 3 a–b. A good result after the synovectomy and excision of a giant popliteal cyst. Synovitis and the recidive formation of a cyst were not observed.

remaining 5 patients a repeat operation was made. Osteoarthritis was diagnosed in one patient, and in one patient progressive rheumatoid inflammation of the knee joint and staphylococcus aureus infection of the wound were assumed to be the cause of recurrence of a giant cyst. In this case synovectomy and re-excision of the cyst performed later, after healing of the infection, gave a disappearance of the cyst. In the remaining 3 patients there were no changes in the knee joint accounting for the recurrence, which probably was bursal in origin.

In this series synovectomy was done in 10 cases. In 3 cases moderate effusion of the knee joint was present at follow-up, despite the synovectomy, but there was no recurrence of the cyst. Stretching and bulging of the posterior wall of the joint was demonstrated by arthrography (Figure 2). Slight or moderate rheumatoid synovitis was present in 9 of the remaining 22 rheumatoid cases, in which synovectomy was not done.

A giant cyst alone was removed in 7 instances. Synovectomy was not done, since there was only slight synovitis. In 4 of these cases radiography revealed progression of rheumatoid changes, and there was clinically moderate effusion; synovectomy was planned. As men-

tioned above, the popliteal cyst recurred in one case because of infection and severe rheumatoid synovitis of the knee joint. In 4 cases synovectomy was done at the same time as excision of the giant cyst, and no recurrence of effusion or of the cyst was observed at follow-up (Figure 3).

DISCUSSION

In 34 out of 82 operatively treated patients Burleson et al. (1956) observed associated diseases, mainly osteoarthritis and RA. Childress (1970) recommended very careful examination of the menisci, because a torn posterior horn of the medial meniscus may be the primary cause of failure of the knee, and the cyst a secondary phenomenon. In this series only 7 patients showed no noncomitant disease. The large number of rheumatoid patients (28) is probably due to selection of the patients who are admitted to hospital. This is the cause of the predominance of females. Communication of the cyst with the knee joint was observed in most cases in this series.

The same phenomenon has been described by other authors (Burleson et al. 1956, Childress 1970). Burleson et al. noticed no disposition to recurrence if the connection in the capsule was not closed, but Childress preferred closure of the capsular defect in any event in elderly patients with osteoarthritis or RA. In this series the capsular defect was closed with fascia from the gastrocnemius-semimembranosus fascia and seemed to be justified.

Perri et al. (1968) reported on 6 giant synovial cysts in patients with RA. According to Perri et al., contrast arthrography should always be considered if a patient with RA shows calf pain and swelling. In the present study arthrography was performed on all patients with giant cysts. No complications occurred. This investigation shows that a popliteal cyst may develop rapidly, as was the case in 10 patients with RA of less than one year's duration. However, cysts are usually found in patients who have suffered from RA for many years.

The X-ray changes of the knee joint were throughout astonishingly slight in the present patients with giant cysts. No severe rheumatoid destructions were seen. Cyst formation seems to be related to severe or chronic soft tissue inflammation with slight changes of the cartilage and bone. Jayson et al. (1970) reported that with increasing volume of a simulated effusion, rupture of the synovium occurred in the controls and in the early stage in rheumatoid knees, not in joints showing advanced rheumatoid changes.

CONCLUSIONS

Preoperative arthrography is indicated if there is any suspicion of intra-articular lesions. In rheumatoid patients it seems to be right to extirpate the popliteral cyst first and perform synovectomy later, if necessary. Patients with osteoarthritic changes of the knee show a striking tendency towards recurrence. The cyst must be totally excised, and closure of the capsular defect may be recommended.

All patients with dissecting giant cysts had RA. Extirpation of a giant cyst and synovectomy of the knee may be done in one phase, but synovectomy may also be done later, if this procedure proves necessary.

SUMMARY

A total of 50 popliteal cysts in 42 patients were operatively treated. A diagnosis of rheumatoid arthritis (RA) was made in 28 patients. A dissecting popliteal giant cyst extending as far as the distal part of the calf was observed in 9 patients, in 2 patients bilaterally (altogether 11 giant cysts). All these cysts were rheumatoid in origin. In the majority of cases (46) the communication between the cyst and the joint was closed. Preoperative X-ray changes of the knee were in general slight. The cyst alone was extirpated in 38 cases, and in 10 cases, 4 of which were giant cysts, synovectomy including meniscectomy was carried out at the same time. All these patients had sever rheumatoid synovitis of the knee joint. Recurrence of the cyst was observed at follow-up in 6 patients, in one patient bilaterally. In 4 cases the failure was attributed to osteoarthrotic or rheumatoid changes of the knee, whereas in 3 cases no changes in the knee joint were found. In a total of 12 rheumatoid cases, slight progression of RA or intermittent synovitis was observed at follow-up, but a palpable recurrent cyst was only detected in one patient. No recurrence was observed in the 10 synovectomized cases.

In rheumatoid patients it seems right to extirpate the cyst first and carry out synovectomy later, if necessary. Other possible failures of the knee joint should be diagnosed preoperatively and treated.

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