

POPLITEAL CYST AFTER FAILED TOTAL KNEE ARTHROPLASTY

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ABSTRACT

A symptomatic popliteal cyst after total knee arthroplasty is rare. We present a case of a large popliteal cyst 5 years after TKA with symptoms of severe calf pain and swelling mimicking a primary tumor. The symptomatic cyst was excised completely in a first-stage operation, and the severely worn TKA was corrected by a second-stage surgical procedure. The patient in this report was pain free and had satisfactory range of knee motion 7 years after the index revision TKA, without recurrence of effusion or popliteal cyst formation.

Key words: Popliteal cyst, total knee arthroplasty, polyethylene wear.

INTRODUCTION

The popliteal cyst, first described by Adams¹ and named by Baker² Most often patients with cysts are asymptomatic or may present with calf tightness or calf pain during activity. Popliteal cysts may present with symptoms identical to thrombophlebitis and have been termed pseudothrombophlebitis^{3,4}. Popliteal cysts occur most frequently as a result of intra-articular knee pathology. Meniscal pathology, rheumatoid arthritis, and a wide variety of granulomatous diseases have been associated with popliteal cysts^{5,6,7}.

A popliteal cyst after total knee arthroplasty (TKA) is a rare occurrence, and there were only 2 reports in the literature^{8,9}. We report a case of a large popliteal cyst resulting from a failed TKA, with symptoms of severe calf pain and functional disability and mimic primary soft tissue malignancy. The symptomatic cyst was excised completely in a first-stage operation and the severely worn TKA was corrected by a second- stage revision TKA.

CASE REPORT

A 74-year-old woman underwent TKA of the right knee (Miller Galante I, Zimmer, Warsaw, IN). for osteoarthritis 6 years ago. The postoperative position of the component and the alignment of the leg were satisfactory. The postoperative course was uneventful, until 5 years after surgery when the patient began to develop progressive pain and swelling over the back of the knee.

As the swelling increased in size within six months, she was referred back to our hospital for further investigation. On clinical examination of the right knee there was moderate pain and crepitation with knee motion. Range of motion of the knee was abnormal (range, 20°—95°). There was a large multilobulated, fluid-filled mass in the popliteal area extending medially. The mass was moderately tender, but no local heat was noted. The neurovascular status was intact.

Further investigation was carried out. Serum laboratory analyses (complete blood count, CRP, ESR, and liver function test were within normal limits.

Radiographs of the right knee showed a large soft tissue shadow in the popliteal and distal femur area.. Doppler examination of the right lower extremity was negative for deep venous thrombosis, and it showed a cystic lesion containing fluid in the right popliteal region consistent with a popliteal cyst. Prosthesis alignment apparently appeared fine without any obvious osteolysis.

Aspiration of the cyst as well as joint revealed black stained fluid and culture of the fluid was negative for any organism or any urate cysts.

The large dissecting popliteal cyst was excised first because of severe pain and calf swelling from the cyst, rather than from the failed TKA. The patient was placed in the prone position, and the dissecting popliteal cyst was excised through a posterior approach [Fig 1]. During the operation, the cyst was found in the popliteal area, extending proximally to the distal femur and

distally to the proximal calf. The popliteal cyst communicated with the prosthetic knee at the posteromedial aspect of the knee. The cyst was multilobulated [Fig 1] with a well-defined thick cystic wall containing blackish fluid filled. Microscopic examination revealed fibrous tissue with metallosis and foreign body reaction of the cyst wall. Polarized light microscopic examination showed numerous refractile extracellular polyethylene particulates throughout the cyst. Complete pain relief was achieved by the cyst removal. The postoperative course was uneventful.

Revision TKA was performed 6 weeks later. The patient underwent removal of a severely worn polyethylene tibial tray and patellar component and subtotal synovectomy of the knee [Fig 2,3]. There was extensive metallosis with synovial hypertrophy. A cemented revision TKA was performed.

At 8 years' follow-up, the knee was doing well, without recurrence of effusion or popliteal cyst formation

DISCUSSION

A dissecting popliteal cyst after TKA is a rare occurrence, and there are only 2 reports in the literature^{8,9} In 1992, Dirschl⁸ reported 4 cases with dissecting popliteal cysts as the presenting symptom of a malfunctioning TKA. Three patients had a revision procedure because of prostheses loosening or severe polyethylene wear of a tibial tray. The popliteal cysts were not excised. In 1983, Pavlov⁹ described 2 patients with rheumatoid arthritis, who presented 2 and 3 years after surgery with symptoms mimicking thrombophlebitis. Arthrography showed popliteal cysts dissecting into the thighs of both patients. There was no loosening of either prosthetic knee. Both patients were treated nonoperatively.

The patient in our case developed a popliteal cyst six years after the primary TKA. The clinical manifestations mimic those of thrombophlebitis or a soft tissue sarcoma. The venous duplex Doppler test excluded the diagnosis of deep venous thrombosis or the sarcoma. The diagnosis of a popliteal cyst was established.

The black discoloration is due to metal debris staining the synovium as well as cyst wall and is a sign failure of TKA due to non-intentional metal on metal articulation secondary to complete poly loss.

The previous cases^{8,9} in the literature concerning popliteal cyst formation after TKA were managed solely by component revision without addressing the cyst itself. The small dissecting popliteal cysts were not excised because of symptoms without deterioration. Dirschl and Lachiewicz⁸ recommended correction of the intra-articular pathology first, with excision of the popliteal cyst performed at a later date if symptoms persisted. We performed a 2-stage procedure on this unique patient because of severe pain in the right calf associated with a large dissecting popliteal cyst. The first-stage operation was complete excision of the popliteal cyst. Posterior pain relief was achieved by cyst removal. The second-stage operation was revision TKA to replace the damaged knee prosthesis.

Popliteal cysts after failed TKA usually contain fluid filled with polyethylene and metal debris . Polyethylene particulates from the wear of a total joint implant have been found to result in the failure of total joint arthroplasties ^{10,11,12}. Such a large cyst could occur and complicate the revision. Complete excision of the popliteal cyst not only resulted in complete symptom relief, but also prevented cyst recurrence and eliminated the polyethylene debris—induced factor of prosthesis loosening. In this circumstance, we believe that separate cyst excision was a good idea.

CONCLUSION

This case report illustrates what can develop when a total knee implant has failed and is allowed to shed large amounts of debris into the joint. Regular follow-up examinations of a joint prosthesis are crucial. This case report illustrates the possible implications of severe chronic effusions in joint implants. In this patient with a symptomatic popliteal cyst after failed TKA, We performed excision of the popliteal cyst first and correction of the intraarticular pathology at a second-stage procedure. The patient in this report was pain free and had satisfactory range of knee motion 5 years after the index revision TKA, without recurrence of effusion or popliteal cyst formation.

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LEGEND

Fig 1

Exploration of the popliteal cyst in the right knee through a posterior approach showing dark metal stained cyst wall

Fig 2

Exploration of the joint at second stage of surgery, through an anterior approach showing dark stained extensive synovial proliferation

Fig 3

Retrieved prosthesis: metal backed patella, tibial tray and poly showing extensive wear, and femoral component

Fig 1

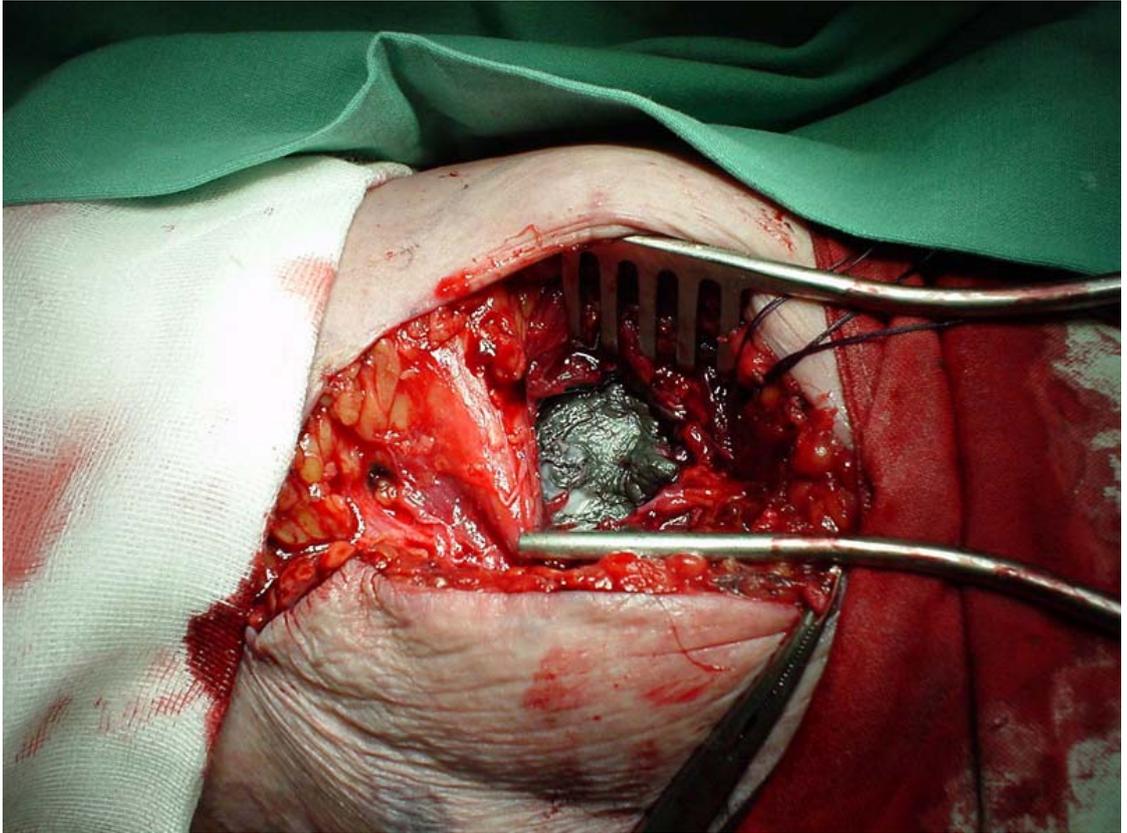


Figure 2

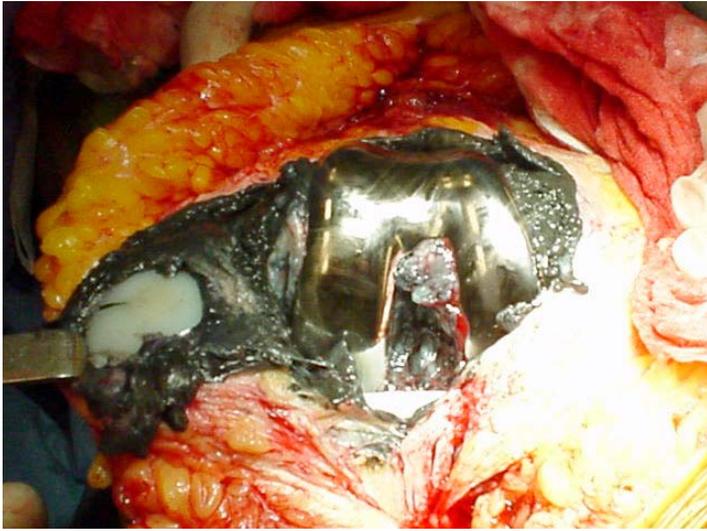


Figure 3



