Ruptured Baker's cyst with compartment syndrome: an extremely unusual complication

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SUMMARY

A 69-year-old man presented with sudden onset of pain with acute tense swelling of his left leg. Initially he was treated empirically with antibiotics for cellulitis while the possibility of deep vein thrombosis was ruled out. His symptoms gradually worsened with progressive distal neurological deficit and increasing pain. Further investigations suggested that he had a ruptured Baker's cyst in the calf with development of compartment syndrome.

BACKGROUND

Baker's cyst is a well-known entity that has been extensively described in the literature.^{1–3} However, very little has been written about complications of this benign condition and particularly rupture of the cyst leading to the development of compartment syndrome. In this paper we present this extremely rare and interesting case, which, if goes unnoticed or not treated promptly, can lead to potentially catastrophic results causing permanent disability.

CASE PRESENTATION

A 69-year-old gentleman presented to the Accident & Emergency department with swelling and redness of his left leg. He was generally fit and well and was not receiving any long-term medications (eg, anticoagulants). There was no history of any previous injury to the affected leg with no obvious signs of skin disruption. On physical examination the patient had a diffusely swollen left calf which was quite tense on palpation. There was also redness over entire leg. Initially he was treated on suspicion of cellulitis with oral antibiotics. At the Emergency Department the possibility of deep vein thrombosis (DVT) was ruled out by performing a Doppler ultrasound and blood tests. On the initial ultrasound it was concluded to be a large popliteal cyst measuring 110×47×66 mm. The radiologist could not determine whether the cyst was infective or haemorrhagic. This patient was later referred to the orthopaedic fracture clinic as his symptoms worsened. At this stage he had developed neurological deficit at the common peroneal nerve with an inability to move his big toe and sensory impairment along the distribution of both the deep and superficial peroneal nerves. His calf was swollen and tense but he did not have excessive pain which is classically seen in acute compartment syndrome. The patient was admitted and urgent MRI scan was done which confirmed a ruptured popliteal cyst with extension into the upper two-thirds of the calf and signal characteristics suggested fresh and altered blood which was compressing the adjacent muscles in the posterior compartment probably resulting in the development of compartment syndrome (figure 1).

TREATMENT

The patient was taken to the operating theatre for emergent fasciotomies to decompress the calf compartments and evacuate the haematoma. Standard incisions for fasciotomies were made on the antero-lateral and the posteromedial surface of the tibia to decompress all four compartments (figure 2), although the major collection seemed to be in the posterior compartments of the leg. A massive haematoma of about 2 litres with blood clots was drained from both posterior compartments. Specimens were sent to laboratory which did not grow any microorganisms. The residual cavity was thoroughly curetted and irrigated.

OUTCOME AND FOLLOW-UP

Postoperatively, the patient recovered uneventfully as the haematoma gradually resolved and neurologic function got back to normal, although swelling persisted for several weeks. Both wounds healed well by secondary intention without need for further surgery. At 7 months postoperative the patient has returned to his previous normal activities of daily living without any functional impairment.

DISCUSSION

Popliteal or Baker's cyst was initially described by Adams in 1840 and later in more detail by Baker in 1877. Baker's cyst is usually considered to be related or caused by an intra-articular pathology and occasionally a large distension can occur due to the formation of a one-way valve mechanism.⁴ These cysts are usually asymptomatic although at times they may rupture spontaneously resulting in a swollen painful leg, which can be clinically indistinguishable from acute DVT.⁵

Generally, treatment consists of simple observation unless persistent pain is caused by an associated intra-articular pathology (eg, meniscal tear, loose bodies, chondral injuries) or compressive symptoms are caused by enlargement of the cyst. In these cases, surgical intervention to remove the cyst may be warranted.⁶

The incidence of popliteal cysts has been shown to be as high as 33% in patients with rheumatoid arthritis and 40% in adult patients with painful effusions and posterior knee pain.⁷

Significant complications and morbidities have been encountered during the course of intra-articular knee pathology with a coexistent popliteal cyst.⁸ These can range from painful rupture of the cyst with no further sequelae, to thrombophlebitis, development of posterior knee and leg abscesses, microbial seeding of the popliteal cyst via pump-assisted arthroscopy, the need for repeated surgical debridement and subsequent

To cite: Hamlet M, Galanopoulos I, Mahale A, et al. *BMJ Case Reports* Published online: 20 December 2012
 doi:10.1136/bcr-2012-007901

Figure 1 MRI scan showing ruptured popliteal cyst with large fluid collection in the posterior tibial compartments.

impaired knee function. Septic arthritis, though less common than popliteal cysts, is not a rare diagnosis.⁹ Most cases of pyarthrosis associated with popliteal cysts arise in patients either spontaneously or after cortisone injections.¹⁰

Development of compartment syndrome due to rupture of a popliteal cyst seems to be an extremely unusual complication. After extensively searching in the literature, we found only four case reports with the two of them occurring after leakage of irrigation fluid into the extra-articular soft tissues due to rupture of the cyst during arthroscopy of the knee joint.^{11 12} The other two cases were both healthy middle-aged men with a Baker's cyst and spontaneous venous bleeding in the posterior leg compartment.^{13 14}

Our patient had significant haemorrhagic effusion with involvement of the posterior compartment of the calf. We suspect that it was venous bleeding as there was no evidence of active arterial bleeding. Due to the rarity of this condition, it can be easily misdiagnosed and subsequently lead to irreversible functional impairment of the lower extremity. On the other hand, prompt diagnosis and emergency open fasciotomy should

Learning points

- ▶ Baker's cysts are common and are usually not associated with significant functional compromise or complications from concomitant knee joint lesions.
- ▶ The most common complication is rupture (50% of complicated cysts) which can be asymptomatic in up to 80% of cases.
- ▶ The aim of this paper is to emphasise the high index of suspicion and the low threshold for aggressive surgical intervention that the treating physician should have when dealing with such a severe complication of Baker's cyst which is by definition a benign condition although quite often associated with intra-articular knee pathology.

allow full recovery and return to the previous level of activity by minimising or even totally reversing neurological compromise caused by ongoing compression of neural elements.

Figure 2 Extended fasciotomies to decompress all four tibial compartments.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned, externally peer reviewed.

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