Case Report

Diagnostic approach to a cystic popliteal mass

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Abstract:
A cystic swelling was found in the left popliteal fossa during knee dissection of a 48 years male cadaver. The swelling was attached with the posterior aspect of knee joint and separated from the other structures. Introduction of a probe through the cavity of the swelling did not establish any communication with the knee joint. The present case described a step wise approach to a cystic swelling in the popliteal fossa.

Key words: Popliteal fossa, Popliteal mass, Baker’s cyst.

Introduction: A cyst is defined as a closed cavity or sac that is lined with epithelium. It can contain liquid or semisolid material; can be normal or abnormal and can occur in soft tissue or in bone. The popliteal fossa is bounded superolaterally by the biceps femoris muscle, superomedially by the semimembranosus and semitendinosus muscles, and inferolaterally and inferomedially by the lateral and medial heads of the gastrocnemius muscle respectively. Various masses frequently encountered during surgery of the popliteal region include Baker’s cyst, meniscal cyst, ganglion cysts, bursitis, nerve sheath ganglion, myxofibroma, lipoma, xanthomas, synovial sarcoma, and vascular tumors. The present case describes a step wise approach to a cystic swelling in the popliteal fossa which will help surgeons and anatomists in the diagnosis of popliteal masses during joint and vascular surgery or dissection.

A cystic swelling was observed in the left popliteal fossa during routine dissection of knee joint of a 48 years old male cadaver in the department of Anatomy, Calcutta National Medical College. Greater access to the structures of the popliteal fossa was achieved by prior anterior dissection of the knee joint to flex the leg and ease the tension of the deep fascia and tendons. The cadaver was placed in the prone position to reveal the posterior surface of the knee. Standard incision lines were followed to incise the skin and superficial fascia. The remnants of the fascia lata and fascia cruris were removed and the popliteal fascia was carefully incised to expose the medial and lateral heads of the gastrocnemius which are retracted at the inferior border to expose the contents of the fossa. Dissection was carried out meticulously to outline the extent and origin of the swelling preserving the surrounding structures. Finally, the structures were painted and photographs were taken.
Discussion: The cystic herniation was deep to popliteal vessels and tibial nerve. [Fig-1] It occupied the floor of the left popliteal fossa and was fixed with the posterior surface of knee joint without any contact with the surrounding bones, muscles, vessels or nerves. [Fig-1] Precise dissection and retraction of superficial structures revealed that it was situated in the superolateral compartment between the two femoral condyles just above the joint line. [Fig-1] A thick gelatinous material was found inside the cyst. Introduction of a probe through the cavity and inspection of the cyst lining did not show any intra-articular communication with the joint cavity. Anterior exploration of the knee joint did not reveal any cause of non-communication or any intra-articular erosion, arthritic change or meniscal tear. [Fig-2] In the present case the cyst was isolated from all the surrounding structures but adhered with the posterior part of the knee joint, therefore suggesting a non-communicating variant of popliteal cyst.

Popliteal cysts were first described in 1840 by Adams. In 1877 Baker described the cyst as a
distended bursa related to the semimembranosus tendon\(^5\). Hence, the term Baker's cyst has been restricted to this type of popliteal cyst rather than applied generally to dilatations of any of the several bursae located in the popliteal fossa\(^6\). Cysts that are usually adherent to the medial head of gastrocnemius are commonly believed to be developed from the bursa associated with the medial head of gastrocnemius\(^7\) while in the lateral part of the popliteal fossa, cysts are thought to be due to distension of popliteus bursa\(^8\). Popliteal cysts derived from semimembranous bursa are usually above the joint line whereas others are usually at or below the joint line\(^9\). Gristina & Wilson supposed that in children the condition arises from direct inflammation of normal bursae, though in adults it often represents an extension from the joint. They found communications between the cyst and a diseased joint in 66\% of their adult patients and suggested that repeated compression during motion causes obliteration of preexisting opening.\(^7\) Communications between the knee joint and the cyst was established in up to 40\% of normal knees at necropsy and radiological studies\(^10\). In the rest, non-communication occurs due to fibrous adhesion, torn posterior horn of any of the menisci etc\(^6, 10\).

In the present case the isolated cyst was possibly formed by direct extension of synovium of the knee joint which was subsequently separated from the joint cavity due to fibrous adhesion.

**Conclusion:** Normally, diagnosis of Baker's cyst is done in patients by clinical examination followed by ultrasonography, arthrography, CT scan or MRI\(^11\). Compression of the popliteal vein, artery and the tibial nerve may present as intermittent swelling of the leg and ankle\(^7\). Rupture of these cysts commonly presents with popliteal and posterior calf pain and swelling, causing the pseudothrombophlebitis syndrome\(^12, 13\).

In symptomatic cases, the treatment option includes rest and leg elevation, Cryotherapy, aspiration of cyst with corticosteroid injection, Prolotherapy and finally surgical excision\(^14, 15\). Hence, the present step wise approach will facilitate surgical exploration of popliteal masses during joint and vascular surgery.

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**References:**