

CASE REPORT

Popliteus tendon tenosynovitis

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This case report highlights an unusual cause of anterolateral knee pain. The popliteus muscle arises from three origins—that is, the lateral femoral condyle, the fibula head, and the lateral meniscus—and inserts into the proximal tibia above the soleal line. It may be subjected to a number of pathologies including tenosynovitis, acute calcific tendonitis, rupture, and even avulsion. In this case, the diagnosis of popliteus tendon tenosynovitis was not made from magnetic resonance imaging findings, but was confirmed and successfully treated during arthroscopic examination.

There are a large number of causes of anterolateral knee pain. Popliteus tendon tenosynovitis is a relatively uncommon condition which most often occurs in athletes or is associated with other knee ligament injuries after trauma. It is highly unusual for this condition to present in a non-athlete without a history of knee trauma and indeed has not been previously described in this type of patient. The purpose of this report is to highlight this condition, its investigation, and its arthroscopic treatment.

CASE REPORT

A 24 year old man presented with an eight month history of gradually worsening anterolateral knee pain. There was no history of trauma recently or in the past. His discomfort was worsened by activity and relieved by rest. There had never been any swelling of the knee and he did not describe any mechanical type of symptoms. He had gained little benefit from simple analgesics and had tried a course of glucosamine which also gave little relief.

The patient was 185 cm tall and weighed 83 kg. The examination of his knee was unremarkable apart from an area of focal tenderness in the region of the proximal tibiofibula joint. Plain radiographs of his knee were reported as normal.

A magnetic resonance imaging (MRI) scan (fig 1A) showed an unusual amount of fluid related to the popliteus sheath. The tendon itself appeared to be intact, and there was no posterolateral corner soft tissue injury. The ligaments, menisci, and hyaline cartilages appeared normal, as did the bone marrow signal and the proximal tibiofibula joint. The proposed diagnosis was a small (8 mm) ganglion within the popliteus tendon sheath.

As the symptoms failed to settle, an arthroscopic examination of the knee was performed. The findings were those of a healthy knee joint with no obvious intra-articular pathology. There was no ganglion within the popliteus tendon sheath. There was, however, clear synovitis of the sheath (fig 1B). After joint irrigation, the sheath was injected with 40 mg methylprednisolone under arthroscopic guidance (fig 1C). By three weeks, the pain had completely resolved and the patient currently remains asymptomatic.

DISCUSSION

The popliteus muscle originates from three sites: the lateral femoral condyle (just anterior and inferior to the lateral collateral ligament); the proximal fibula; the posterior horn of the lateral meniscus. The third origin has been shown to be absent from up to 82.5% of knees.¹ It is the femoral origin that is the strongest. The popliteus muscle inserts into the posterior surface of the proximal tibia, above the soleal line. The tendon runs deep to the lateral collateral ligament and



Figure 1 (A) Magnetic resonance imaging scan showing increased fluid around the popliteus tendon (black arrow). (B) Arthroscopic view of popliteus tendon (black arrow) and sheath tenosynovitis. (C) Arthroscopic view of sheath injection.

passes through a hiatus in the coronary ligament to attach to the lateral femoral condyle. This muscle is unique in that its origin and insertion are reversed—that is, its proximal attachment (origin) is its tendinous portion whereas its muscle belly sits distally. Its primary function is that of internally rotating the knee^{2–4}—that is, it rotates the tibia medially on the femur. The popliteus tendon and popliteofibular ligament have also been reported to be the most important structures for preventing external tibial rotation.⁵ The popliteofibular ligament in the adult has a mean length of 47 mm and a mean cross sectional area of 6.9 mm².⁶ The mean maximal force to failure has been shown to be 425 N (range 204–778) compared with 750 N (317–1203) for the lateral collateral ligament.⁶

After trauma, the popliteus tendon may rupture⁷ or even be avulsed.⁸ The latter may result in both a chondral fracture and a haemarthrosis. The tendon may also undergo acute calcific change,⁹ which may be easily noted on plain radiographic examination. MRI examination of the popliteus muscle and its tendon is often the most informative investigation at our disposal; however, this test does not always provide clear answers.

The arthroscopic assessment of the popliteus tendon has been previously described.¹⁰ In the case of popliteus tendon tenosynovitis, arthroscopic examination allows formulation of an accurate diagnosis and also, as in our case, administration of the appropriate treatment.

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COMMENTARY

This paper highlights an unusual cause of anterolateral knee pain. The MRI findings were initially misinterpreted probably because of the rare nature of the condition. The MRI findings and arthroscopic findings are compatible with the described condition. The fact that arthroscopically directed steroid injection into the area of inflammation caused symptomatic relief lends credibility to the presumed diagnosis and gives the reader a possible means of addressing this rare disorder.

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