

Case Report

Two Cases of Tibial Nerve Compression Caused by Uncommon Popliteal Cysts

Valerio Sansone, M.D., Corrado Sosio, M.D., Marco da Gama Malchère, M.D.,
and Alessandro De Ponti, M.D.

Abstract: We report 2 cases of a popliteal mass of very unusual origin that induced compression neuropathy. The signs and symptoms could have been mistaken for those of a common Baker's cyst. Several recent studies have shown that the cause of Baker's cyst formation should be sought within the joint because of a communication between the gastrocnemio-semimembranosus bursa and the joint cavity. These 2 cysts had no communication with the articular joint, thus suggesting that the surgeon perform an open exploration of the popliteal fossa in the search for other cystic formations with origins and features different from Baker's cysts. **Key Words:** Tibial nerve—Popliteal cyst—Plantaris muscle—Tibiofibular joint.

Cystic formations are responsible for the largest number of popliteal masses.¹⁻³ When symptomatic, they induce a slight tenderness at the posterior aspect of the knee, but sometimes they may cause disabling pathologies, such as thrombophlebitis, compartment syndrome, and entrapment neuropathy.⁴⁻⁶ In these cases, surgical decompression of the popliteal fossa by removing the cyst resolves the symptoms.

We report 2 cases of popliteal masses that caused peripheral compression neuropathy and had signs and symptoms that could be mistaken for those of a common Baker's cyst. Several previous studies^{3,7,8} have shown that the cause of Baker's cyst formation should be sought within the joint because of the communication between the gastrocnemio-semimembra-

nus bursa and the joint cavity. However, these cysts had no such communication with the joint cavity. In the first case, the origin of the cyst was a rare degeneration of the plantaris muscles, and in the second case it was an unusual herniation of the synovium of the proximal tibiofibular joint.

CASE REPORTS

Case 1

A 70-year-old woman presented with a 3-year history of pain at the posterior aspect of her right knee especially after standing all day long. On examination, there was a palpable mass in the right popliteal fossa more evident on the lateral side and with the knee completely extended. Radiographs were normal, but magnetic resonance imaging showed a cystic mass in the popliteal fossa that was not clearly communicating with the articular joint (Fig 1).

The patient underwent a 2-step surgical procedure. First, an arthroscopic examination was performed that did not show any evidence of intra-articular pathology or of capsular opening. Then a surgical exposure of the popliteal fossa was performed that revealed a voluminous cystic mass, dislocating the main neuro-

From the Clinica Ortopedica dell'Università di Milano (V.S., M.dG.M.); and the Divisione di Ortopedia, Ospedale San Raffaele (C.S., A.dP.), Milano, Italy.

Address correspondence and reprint requests to Valerio Sansone, M.D., Clinica Ortopedica dell'Università di Milano, Ospedale San Raffaele, Via Olgettina 60, 20132 Milano, Italy. E-mail: valerio.sansone@unimi.it

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FIGURE 1. Magnetic resonance image of the right knee (TR, 650 msec; TE, 14 msec; FA, 90°). Sagittal plane showing a mass in the popliteal fossa originating from plantaris muscle tendon.

vascular structures. Dissection of the cyst was undertaken but a tendinous structure strictly connected to the cyst was exposed. It was not possible to dissect the tendinous structure, which seemed to originate from the tendon of the plantaris muscle. The cystic mass and tendon were then removed en bloc. The cyst was filled with a mucoid-like material (Fig 2). The histologic diagnosis was compatible with synovial cyst. Postoperatively, the patient's pain greatly decreased and she recovered completely in a few weeks.

Case 2

A 50-year-old man was referred with a 2-year history of pain at the posterior aspect of his right knee and paresthesia at the plantar aspect of the right foot. He reported that 1 year before he had undergone an unsuccessful surgical decompression of the tibial nerve because of tarsal tunnel syndrome. A previous electromyographic study had shown signs of tibial nerve compression at the knee-ankle segment. On examination, he had a palpable mass in the right popliteal fossa on the lateral side, and dysesthesia in the territory of the tibial nerve. His radiographs were normal. Computed tomography showed the presence of a cystic mass in the popliteal fossa. A 1-stage 2-step surgical procedure was performed: an arthroscopic examination first, which failed to show any evidence of intra-articular pathology, and then a surgical exposure of the popliteal fossa. A cystic mass, displacing the neurovascular structures, was easily dissected and a small pedicle communicating with the proximal tibiofibular joint was found (Fig 3). The cyst was

removed en bloc and the pedicle tied. A complete and quick recovery followed in 3 weeks.

DISCUSSION

We have presented 2 rare cases of popliteal cystic pathologies causing peripheral compression neuropathy that did not originate from an enlargement of the gastrocnemio-semimembranosus bursa. Recent studies^{3,7,8} have confirmed the strong association between Baker's cyst and intra-articular pathology. In these cases, arthroscopic treatment with the aim of eliminating the intra-articular pathology that causes and sustains the cyst has been proposed.³ This approach eliminates the need for open surgical removal of a Baker's cyst. In our cases, the arthroscopic approach failed to reveal any intra-articular pathology, thus inducing the surgeon to perform a posterior open approach. The noncommunicating nature of the cysts was then confirmed and the definitive removal of the cyst was accomplished.



FIGURE 2. The excised cyst.



FIGURE 3. Computed tomography scan of the right knee shows a mass expanding into the popliteal fossa and originating from the proximal tibiofibular joint.

In both cases, the cysts reached a volume able to induce a compression on the neurovascular popliteal structures. In the first case, the dislocation of the tibial nerve caused only painful symptoms, especially after daily activities. In the second case, the patient complained of paresthesias at the plantar aspect of the foot that had induced the previous surgeon to perform the ineffective tibial nerve neurolysis. Finally, removing the cysts immediately eliminated the neurologic symptoms.

In the literature, only 1 case of cystic degeneration of the plantaris muscle has been reported.⁹ In this case, the posterior pain was caused by the recurrent ischemia resulting from muscular compression and not by irritation of neurovascular structures. In addition, there have been very few reports of nerve compression by

cysts originating from proximal tibiofibular joint, but in these, the neural structure involved was always the peroneal nerve.¹⁰ When the preoperative evaluation is not able to identify the origin of the cyst, the presence of a noncommunicating cystic pathology should be sought.^{11,12} In particular, a negative arthroscopic examination of the articular joint should incline the surgeon to perform an open exploration of the popliteal fossa in the search for other cystic formations with origins and features different from those of Baker's cysts. Although a minimally invasive but effective approach for the treatment of Baker's cysts has been advocated,³ one should not make the opposite mistake. In other words, trusting in the assumption that almost all popliteal cysts may be treated arthroscopically, a surgeon should not avoid performing a conventional open surgical procedure out of fear of overtreatment when intra-articular pathology or an articular communication has not been identified.

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