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Original article

Arthroscopic resection of benign tumors of the knee posterior compartment: A report of 15 cases

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ABSTRACT

Introduction: The management of tumors located in the posterior compartment of the knee, whatever the nature of the tumor, remains surgical excision and can be done by open surgery or under arthroscopic control. The objective of this study was to evaluate the arthroscopic management of intra-articular tumors of the posterior compartment of the knee. The hypothesis is that tumors or tumor-like lesions confined to the posterior compartment are accessible by arthroscopy with low iatrogenic risk.
Materials and methods: All patients with an intra-articular tumor of the posterior compartment of the knee were enrolled between 2009 and 2013. The surgical management consisted of arthroscopic resection. Patients underwent postoperative MRI, repeated at last follow-up. The outcomes were the occurrence of complications, functional evaluation using the Lysholm Knee Scoring Scale, and the recurrence rate.
Results: Fifteen patients were included. All patients had a complete resection. One case of delayed healing of the arthroscopic entry point was observed. At a mean 22 months, the mean Lysholm Knee Score increased from 74 (±8.5) preoperatively to 92 (±7.7) postoperatively, a significant increase of 18 points ($P = 0.001$). One patient had a recurrence of osteochondromatosis, requiring removal of a foreign body.
Discussion: Resection of posterior intra-articular tumors of the knee using arthroscopy is possible, subject to a learning curve.

1. Introduction

Intra-articular tumors or tumor-like disesases of the posterior compartment of the knee are rare. These are predominantly located in the anterior compartment. Posterior locations in certain knee diseases can suggest a tumor aspect.

Few intra-articular tumors of the posterior compartment of the knee have been described to date. Only cases of fibroma [1], synovial and meniscal cyst [2–4], mucoid cyst [5,6], synovial sarcoma [7–9], localized pigmented villonodular synovitis [10–17], and hemangioma [18] have been reported.

The objective of surgical management is to obtain complete excision of the tumor with a minimal risk of complications and functional sequelae. Contrary to tumor resection or open synovectomy [19] via the posterior approach, arthroscopic management could reduce the functional sequelae of the knee and decrease the rate of complications, notably during posterior synovectomies, for a recurrence rate comparable to that already demonstrated for pigmented villonodular synovitis of the knee [20].

The objective of this study was to assess the arthroscopic management of 15 patients presenting an intra-articular tumor or a tumor-like disease of the posterior compartment of the knee.

We hypothesized that tumors or tumor-like diseases confined to the posterior compartment are accessible to arthroscopy with a low iatrogenic risk rate.

2. Material and methods

Fifteen patients treated between 2009 and 2013 presenting an intra-articular tumor of the knee involving at least the posterior compartment were retrospectively included. The medical files were discussed with osteoarticular radiologists and none of these tumors was considered malignant.

The patients' mean age was 37 years (range, 17–59 years) with eight females and seven males. Of these 15 patients, one who had a synovial cyst was lost to follow-up. The mean follow-up of the remaining 14 patients was 22 months (range, 6–49 months).

Three of the patients were treated for localized pigmented villonodular synovitis in the posterior compartment (Figs. 1 and 2), three for posterior meniscus synovial cysts, three for osteochondromatosis, three for mucoid synovial cysts of the posterior cruciate

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Fig. 1. MRI, sagittal T1 and T2 sequences, located behind the posterior cruciate ligament.

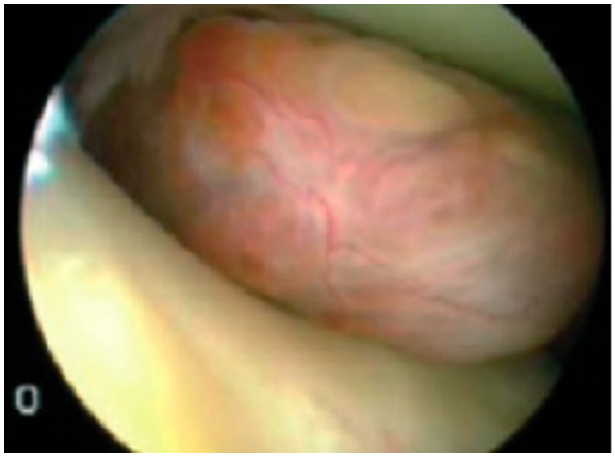

Fig. 2. Arthroscopic view of localized pigmented villonodular synovitis.

ligament (PCL), two for aspecific chronic synovitis, and one for intra-articular hemangioma (Fig. 3).

The series included seven diffuse locations in the two posterior compartments of the knee, six at the base of the PCL, one posterolateral, and one posteromedial.

Fig. 3. Posteromedial arthroscopic view of an intra-articular hemangioma.

In all cases, management consisted of arthroscopic surgical resection of the intra-articular tumor of the knee.

The evaluation criteria were the quality of the resection, the occurrence of complications, and the functional evaluation of the knee using the Lysholm Knee Scoring Scale (LKSS). We also studied the overall recurrence rate.

Two senior surgeons operated on all the patients using a standardized procedure.

The mean duration of the intervention was 50 min (range, 40–90 min).

The patients were operated under general anaesthesia, in the decubitus dorsal position with a tourniquet. The knee was maintained in 90° flexion. In this position, the common fibular nerve and the popliteal artery were folded back, thus limiting iatrogenic risks [21–23], as was the sartorial branch of the saphenous nerve located approximately 10 mm behind the entry point of the posteromedial approach. All the patients underwent preliminary arthroscopic exploration of the anterior compartment of the knee with a 4.5-mm arthroscope and 30° fore oblique using the classic anterolateral, anteromedial approaches, alternatively for visualization and instrumentation. The anterolateral and anteromedial approaches were placed adjacent to the edge of the patellar tendon 1 cm above the joint space, thus allowing easier passage into the posterior compartment of the knee going through the femoral notch [24,25].

For reasons of symmetry, the arthroscopy of the posterior compartment was always initiated by the posteromedial approach. This entry point was positioned using anterolateral arthroscopic guidance, passing the arthroscope at the medial edge of the PCL so as to access the posterior compartment. The entry point was identified using transillumination [26,27].

Located behind the lateral collateral ligament and above the tendon of the femoral biceps muscle and thus avoiding the common fibular nerve, the posterolateral approach was established in the same way, passing the arthroscope in the posterior compartment via the anteromedial approach, at the lateral edge of the anterior cruciate ligament (ACL).

One patient (synovial cyst) required resection via the exclusively posterolateral instrument portal and the anteromedial optical portal. Two other resections were exclusively performed via the posteromedial arthroscopy portal and the anterolateral optical portal, for a medial posterior meniscal cyst and a synovial cyst. The three cases of diffuse osteochondromatosis in both posterior compartments were treated by alternating the posteromedial