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Case report

Arthroscopic treatment of an intra-articular hemangioma in the posterior compartment of the knee

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ABSTRACT

We report the case of a 37-year-old patient presenting with knee pain and recurrent effusion without instability due to an intra-articular hemangioma in the posterior compartment of the knee. MRI showed features suggesting a diagnosis of hemangioma. Arthroscopic excision of the tumor was performed and the diagnosis was confirmed histologically. There was no recurrence after 5 years of follow-up.

1. Introduction

Synovial hemangioma is a rare benign tumor. Its clinical features are not specific, making diagnosis difficult, which can delay therapeutic management. To our knowledge this is the first reported case of intra-articular hemangioma of the posterior compartment of the knee to be treated by arthroscopy alone.

2. Case study

A 37-year-old woman presented after 9 months of knee pain with a stable knee with no history of trauma and no episodes of swelling. The clinical examination did not show any signs of a tumor, no cutaneous deformity, no muscular atrophy, but pain when the popliteal fossa was palpated. The knee was stable with a normal range of motion and no sign of meniscal injury or effusion. Biological tests were normal. AP and lateral X-rays were normal with no erosion of the femoral cortex, periosteal reactions, indirect signs of effusion or microcalcifications. The CT scan of the knee was normal. T1-weighted MRI images showed a well-circumscribed mass in contact with the posterior cruciate ligament (PCL) that was isointense in relation to the muscle (Fig. 1). T2-weighted images showed intra-articular effusion associated with synovial hypertrophy and a heterogeneous tumor on the PCL (Figs. 2 and 3). Early enhancement of the tumor was observed after gadolinium injection associated with peripheral synovial enhancement. These features strongly suggested a diagnosis of hemangioma. After a pluridisciplinary decision with radiologists specialized in orthopedics, a

Fig. 1. T1-weighted sagittal MRI of the hemangioma located in the posterior compartment of the knee in front of the posterior cruciate ligament.

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Fig. 2. T2-weighted sagittal MRI of the hemangioma located in the posterior compartment of the knee in front of the posterior cruciate ligament.

diagnosis of hemangioma was suspected and arthroscopic excision was proposed using conventional anterolateral and anteromedial portals for the instruments and the arthroscope. A combined posteromedial and posterolateral portal was created via a transeptal portal to obtain a single posterior portal allowing the surgeon to have continuous visual control by reversing the portals for the instruments and the arthroscope [1]. Excision of the hemangioma

Fig. 3. T2-weighted axial MRI of the hemangioma located in the posterior compartment of the knee in front of the posterior cruciate ligament.

Fig. 4. Arthroscopic view of the hemangioma before excision by the posteromedial portal.

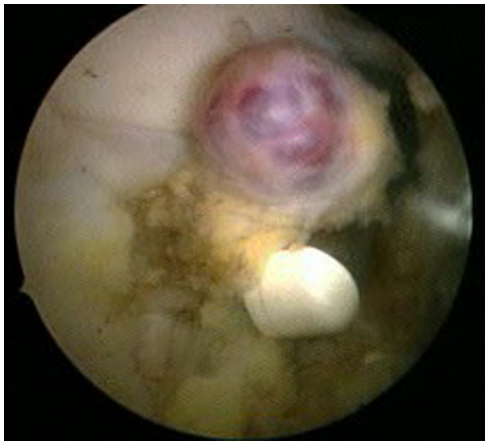

Fig. 5. Arthroscopic view of the hemangioma after excision by the posteromedial portal.

was performed arthroscopically by positioning the arthroscope in the posteromedial portal and the electrosection device (Vaper) in the posterolateral portal (Figs. 4 and 5). Once excision had been performed, the tumor was removed in the cannula by the posterolateral portal. Complete excision of the tumor was obtained. Macroscopically the tumor was round, purplish, soft and approximately 5 mm in diameter.

Histological analysis showed the presence of dilated vascular spaces in the synovial tissue, which confirmed the diagnosis of a cavernous synovial hemangioma. The synovial margins of the tumoral excision were healthy.

There was no recurrence after 5 years of follow-up. Knee function and the clinical examination were normal with no signs of osteoarthritis on X-ray.

3. Discussion

Although hemangiomas are the most frequent benign tumors, synovial hemangiomas are rare.

The diagnosis of a synovial hemangioma is often delayed because of non-specific symptoms. Holzapfel et al. reported a mean delay in diagnosis of 4.5 years with a maximum of 20 years [2].

The usual symptoms are knee instability which may or may not be isolated, the presence of a palpable mass, the presence of recurrent hemarthrosis or simply swelling of the knee as well as atrophy of the quadriceps and a reduced range of motion [3,4]. It is

easy to blame these disturbances on a meniscal, ligament or septal anomalies.

Holzapfel et al. have suggested that synovial hemangiomas are a reaction to trauma [2]. Moon supports this hypothesis and reports that 35% of patients had trauma prior to the development of the hemangiomas [3].

For Devanay et al., the knee is the main location of synovial hemangiomas (60%) [4]. They are mainly found in the anterior compartment of the knee [5–9]. Only one case of hemangioma in the posterior compartment of the knee has been described in the literature, with excision by posterior open surgery [8]. To our knowledge, ours is the first reported case of intra-articular hemangioma of the posterior compartment of the knee treated by arthroscopy alone.

The tumor and its adjacent vascular connections can be precisely located on MRI, helping to make the diagnosis and plan surgical management. Sasho reported the typical imaging features of hemangioma: an iso- or hypointense homogenous signal on T1-weighted images, a hyperintense signal on T2-weighted images with a hypointense signal of the posterior septum, a well defined synovial membrane on T2-weighted images and heterogeneous enhancement after gadolinium injection [9]. In case of doubt, arthroscopic biopsy may be proposed, limiting the risk of dissemination compared to conventional biopsy [10,11]. A final diagnosis is based on histological analysis in all cases showing vascular proliferation.

Different treatments have been proposed for the management of hemangiomas: embolization, open surgical excision with total or partial synovectomy, mechanical arthroscopic excision, or by YAG laser to control peripoperative bleeding [12,13]. In 1990, Meislin was the first author to suggest arthroscopic exploration and treatment of suprapatellar hemangiomas [12]. Very few intra-articular hemangiomas have been treated by arthroscopy [7,13–15] and there is no consensus on the treatment of intra-articular hemangiomas of the knee to date. Numerous authors recommend excision by arthrotomy, which is felt to be more complete than by arthroscopy [6].

Because of the advances made in MRI, we feel that an open surgical approach is no longer justified to determine local tumoral extension. It is important to compare the chronology of the symptoms and the features of the tumor on MRI to exclude a malignant tumor [9]. As a result, minimally invasive, multidisciplinary management of this entity is preferable to open surgery by posterior approach. The posterior arthroscopic technique should be performed with the patient in the dorsal decubitus position with the knee in 90° flexion to create space to work in the posterior compartment [1,16,17]. Anterolateral and anteromedial portals provide access to the posterior compartments passing by the intercondylar notch. [18]. The position of the posteromedial portal can then be positioned by direct arthroscopic control. [19,20]. The posterolateral portal, located behind the lateral collateral ligament and above the biceps femoris tendon, thus avoiding the common fibular nerve, is created in the same way by passing the arthroscope through the anteromedial portal. Once both posterior portals have been created, the arthroscope is positioned in the posteromedial portal to visualize the PCL and the posterior septum. The presence of a septum makes it necessary to create a posterior transeptal portal [21]. The posterolateral portal is created using the "back and forth" technique with the Winsinger's maneuver as described by Louisia and Beaufils [22].

Arthroscopic excision using an arthroscopic electrode system should be the treatment of choice in benign intra-articular lesions that are well circumscribed, encapsulated, of various sizes and attached to the synovial membrane by a pedicle or synovial adhesions [1,13–15]. McLain et al. report that the quality of biopsies obtained with a mechanical shaver are too poor to obtain a histological diagnosis [23]. Moreover, the mechanical fragmentation of tumoral tissue can accelerate intra-articular tumoral dissemination. On the other hand, an arthroscopic electrode limits the risk of articular dissemination, architectural abnormalities of the excised tumor sample and peri- and postoperative bleeding [13–15].

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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