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Case report

Localized form of pigmented villonodular synovitis of the knee: The meniscal mime

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ABSTRACT

The localized form of pigmented villonodular synovitis of the knee is a rare condition with non-specific symptoms. This makes diagnosis especially difficult when the meniscus is affected. A full assessment with several imaging modalities can help support the preoperative diagnosis. But in the case reported here, the full clinical and paraclinical assessment (X-rays, CT arthrography and MRI) was wrong – the localized form of pigmented villonodular synovitis had mimicked a lateral meniscus injury and was only detected during arthroscopy. The lesion was excised surgically and the diagnosis was confirmed through postoperative histopathology.

1. Introduction

Pigmented villonodular synovitis (PVNS) is a rare condition [1]. Because the localized form has non-specific symptoms, diagnosis can be challenging. Results from additional imaging modalities could by misleading, especially if the assessment is incomplete. The PVNS case reported here mimicked a lateral meniscus injury on all of the preoperative assessments (clinical, X-rays, CT arthrography and MRI). The diagnosis of pigmented villonodular synovitis was only made during arthroscopy.

2. Case report

A 31-year-old male runner (two hours per week) consulted us for locking, catching, mechanical pain and exercise-induced swelling of his right knee, which had been present for several months, but had no known triggering event. His maximum walking distance was less than 2 km, with no feelings of instability. Palpation of the lateral tibiofemoral joint line elicited pain and the Apley grind test was positive. The patient had normal leg alignment. There was no joint laxity in the frontal or sagittal planes. There were no bone lesions visible on X-rays. CT arthrography revealed that the posterior horn of the lateral meniscus was detached and dislocated from the lateral femoral cortex (Fig. 1) without cartilage injury. An MRI was performed to provide additional clues and confirmed the diagnosis of lateral meniscus injury (Fig. 2) without signs of osteonecrosis. A surgical indication was made for arthroscopy treatment of the lateral meniscus injury.

The procedure was performed with a tourniquet under spinal anaesthesia in dorsal decubitus using classic surgical approaches. Exploration of the lateral meniscus revealed a self-contained, loose mass of hypertrophic synovium about 7 mm long, red-brown in colour with a sessile insertion. This mass was adherent to the meniscus-synovium junction of the superior side of the middle part of the lateral meniscus, mimicking an unstable meniscus injury (Fig. 3). Complete resection of its base with basket forceps was performed to achieve a wide margin of safety and resulted in partial avulsion of the meniscus, widening of the popliteal hiatus and concerns about the mechanical integrity of the meniscus. A rasp was used to expose bleeding bone and then the meniscus reattached with anchors using an "all-inside" technique. This resulted in the meniscus being stable when pulled on (Fig. 4). The remainder of the intra-articular assessment was normal. After resection, the tissue specimen was sent to histopathology. Histology analysis found the cell combination that is characteristic of villonodular synovitis: multi-nucleated giant cells with no atypical features and globular looking cells, with round nuclei and cytoplasm overloaded with hemosiderin deposits. Immediate full weight-bearing was allowed with flexion limited to 90° for one month. At the clinical follow-up one month post-surgery, the symptoms were no longer present. There was no recurrence of the pain within the next two years of follow-up.

3. Discussion

PVNS is a rare condition with unknown aetiology. The annual incidence has been reported to be 1.8 per million people [1]. The

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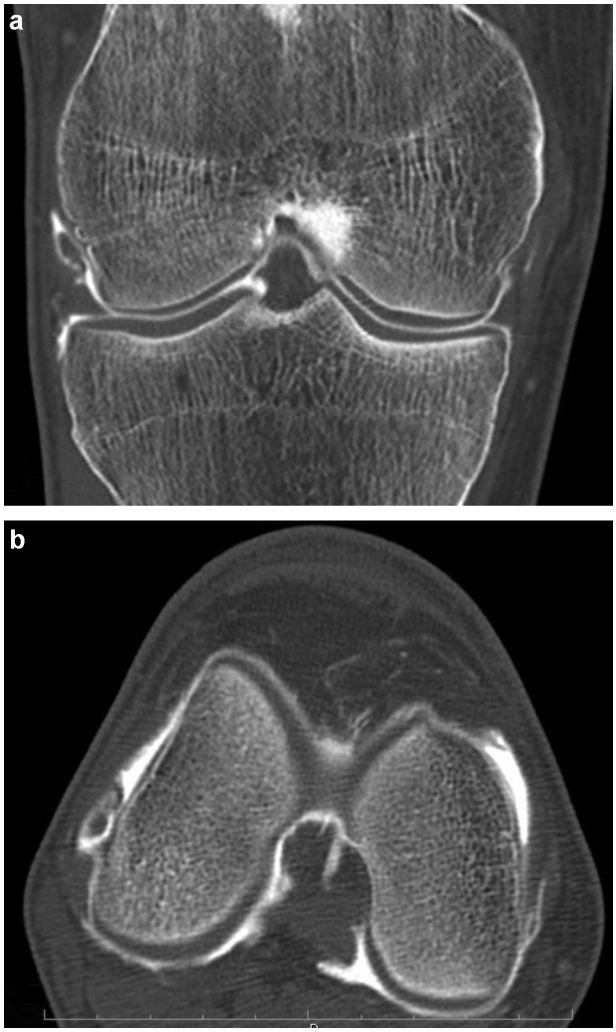

Fig. 1. Coronal (a) and axial (b) slices from CT arthrography of the right knee showing a lesion outlined by contrast medium in the lateral femoral cortex, that was initially interpreted as a dislocated meniscus tear in the posterior horn of the lateral meniscus.

Fig. 2. Coronal MRI slices with PD fat saturation sequences of the right knee showing a lesion with an intermediate signal in contact with the lateral meniscus.

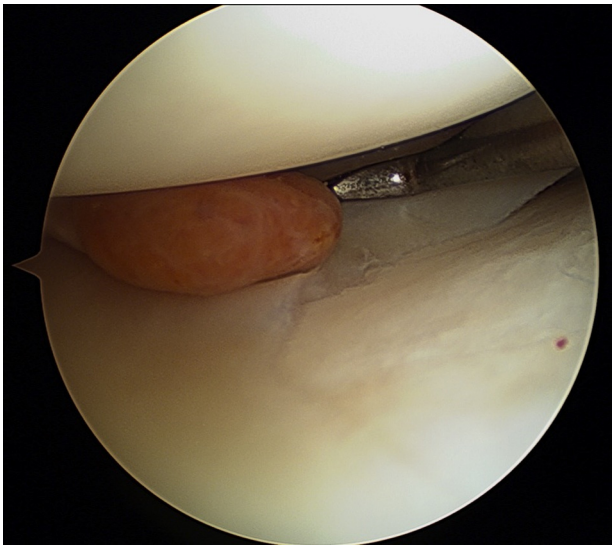

Fig. 3. Intra-operative arthroscopy view of the localized pigmented villonodular synovitis lesion which is about 7 mm long, red-brown in colour with a sessile insertion adhered to the meniscus-synovium junction of the superior face of the middle segment of the lateral meniscus.

average age of patients with PVNS is typically between 30 to 50 years old [2–5], which corresponds to the patient described here.

Two forms of pigmented villonodular synovitis have been described: diffuse and localized [6]. The localized form makes up 15–25% of PVNS cases [1,7], but one study found it seven times more common than the diffuse form [5]. The knee is affected in two-thirds of cases [7]. PVNS has been found in several locations within the knee joint: meniscus-synovium junction, intercondylar notch, lateral and medial femoral cortex, Hoffa's fat pad, posterior compartment [3,4].

In most patients with the diffuse form, the diagnosis is straight-forward given the suggestive clinical picture (repeated haemarthrosis with pain, then stiffness, mirrored bone cysts, cortical erosion, osteoarthritis) [7,8]. For certain diffuse forms, but especially for the localized forms, the observation of non-specific symptoms makes diagnosis challenging. Discomfort is always present but the clinical presentation is variable: locking (30–100%

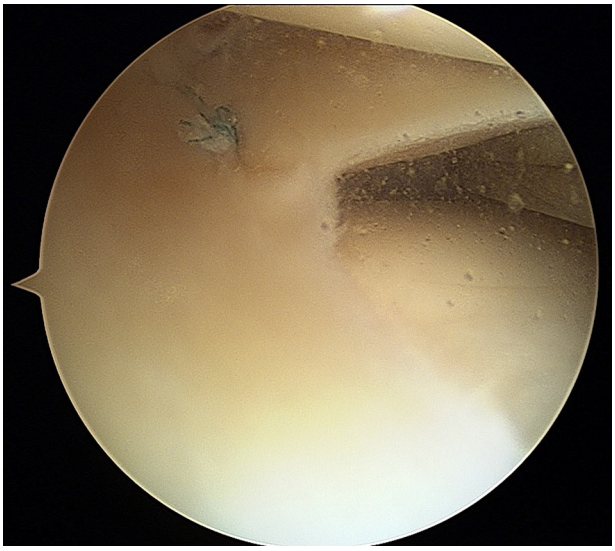

Fig. 4. Intra-operative arthroscopy view after anchor reattachment using an all-inside technique for the lateral meniscus peripheral avulsion created by resection of the sessile lesion and its base.