

CASE REPORT

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Locking of the knee caused by localized pigmented villonodular synovitis: a case report

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Abstract Pigmented villonodular synovitis (PVS) occurs in two forms: diffuse PVS and localized pigmented villonodular synovitis. In this report, a 40-year-old woman presented with a history of recurrent episodes of knee locking and pain. Arthroscopy revealed a nodular pedunculated mass occupying the area anterior to the intercondylar notch of the femur. Histological examination of the tissue confirmed the diagnosis of PVS. After surgery, the patient's symptoms of pain and recurrent locking promptly resolved.

Key words Arthroscopy · Knee · Pigmented villonodular synovitis (PVS)

Introduction

Pigmented villonodular synovitis (PVS) occurs in two forms: diffuse and localized (LPVS). The knee joint is the site most commonly affected, although lesions have been described in a variety of other joints. Most consider PVS to be a benign inflammatory process, whereas others think that the pathological characteristics of some lesions suggest a neoplastic condition.¹ We present a case of LPVS of the knee that caused it to lock recurrently. Arthroscopic procedures to remove the lesion were performed, and no recurrence was observed.

Case report

A previously healthy 40-year-old woman presented with a 1-year history of pain in her left knee. It began when the

patient started to kneel and felt her left knee lock, preventing full extension. She saw her local physician immediately, who manipulated the knee into extension. Approximately 3 months after the initial injury, the patient again experienced locking of her left knee while running. During this second occurrence, the patient was unable to unlock her knee, and she visited her local physician for treatment. One week after her second injury, the patient visited our hospital. She had no history of remarkable swelling or hemarthrosis of the left knee joint.

Examination revealed a slight limp and restricted range of motion in the knee joint. There was no ligamentous abnormality, and she had no typical meniscus tear signs. No biochemical disorders in the blood examinations were seen. Radiographs did not reveal any abnormal shadows. However, magnetic resonance imaging (MRI) did reveal a mass in the anterior intercondylar space near the insertion of the anterior cruciate ligament. She had experienced both medial and lateral knee pain, which was exacerbated by squatting, standing, and walking. Prior to surgery, her symptoms worsened after prolonged standing, and she could not squat or fully extend her left knee because of pain.

Arthroscopy revealed a nodular pedunculated mass occupying the area anterior to the intercondylar notch of the femur (Fig. 1). The mass was round with a smooth surface and yellow-brown pigmentation. The remaining synovium was seen within the joint space, and all structures were noted to be normal. No other similar lesions were detected. The entire lesion was completely removed through the anteromedial portal. Histological examination of the lesion demonstrated the presence of multinucleated giant cells, hypercellularity, fibroconnective tissue, and pigmentation (Fig. 2). These features established the diagnosis of PVS.

The patient's symptoms of pain and recurrent locking promptly resolved. At her 7-month postoperative follow-up, the patient remains symptom-free and has returned to a low level of sports participation.

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Discussion

Pigmented villonodular synovitis occurs in large joints, bursa, or tendon sheaths. The etiology is unknown. It occurs in two forms: a diffuse pigmented villonodular synovitis involving the entire synovium or a localized pigmented villonodular synovitis.

The localized form of PVS is a rare pathological condition. The knee joint is most commonly affected, and the disease is generally characterized by the presence of a single pedunculated nodular lesion. The patient occasionally presents with various symptoms such as pain, swelling, or a palpable mass in the knee.^{2,3} There are a few previous case reports of localized PVS lesions producing meniscal symptoms.⁴⁻⁶ In the present case, prior to surgery the patient had a recurrence of her knee locking, such as might occur with a locking bucket handle tear of the meniscus.

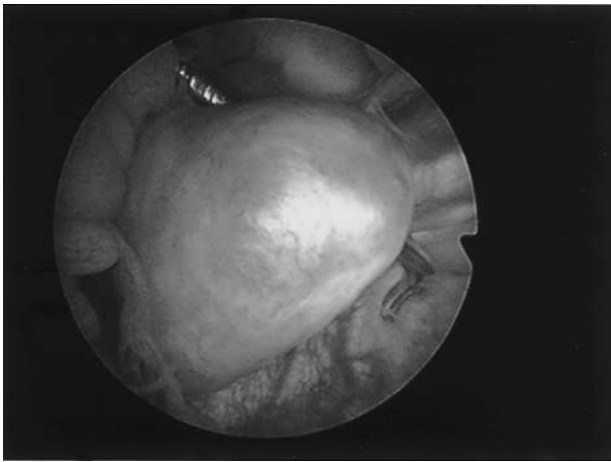
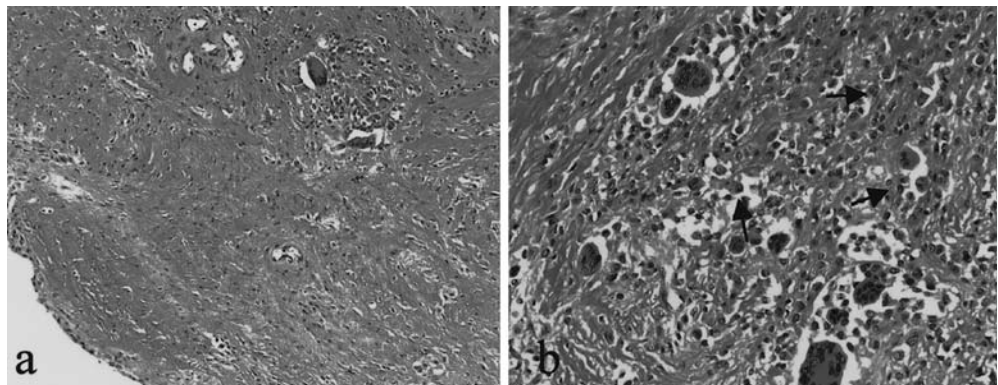


Fig. 1. Localized pigmented villonodular synovitis lesion located anterior to the intercondylar notch

Fig. 2. **a** Pathology of localized pigmented villonodular synovitis demonstrates multinucleated giant cells, hypercellularity, and fibroconnective tissues. **b** At higher magnification, pigmentation (*arrows*) is seen to be present. H&E. **a** $\times 100$, **b** $\times 200$



Histologically, PVS is characterized by a fibrous stroma, proliferation of round histiocytic cells or spindle cells, and hemosiderin deposits in macrophages and synovium. The lesions are predominantly villous or nodular in appearance, and in some cases both are seen. The degree of pigmentation ranges from barely yellow to dark brown.¹

Although radiographic findings are usually normal when examined in localized PVS, a soft tissue mass is occasionally seen. In patients with a diffuse form of PVS, bony changes are observed in a few cases and consist of cyst formations, cortical erosions, and osteopenia.^{4,5} The MRI finding of a localized form of PVS is relatively specific, and the signal intensity is similar to that of the diffuse form of PVS, which is characterized by a hypointense area on both T1- and T2-weighted images. This pattern correlates with intralesional deposits of hemosiderin. However, this appearance is not specific for the localized form of PVS and can be confused with synovial chondromatosis or fibroxanthoma.⁷

The localized form of PVS has a good prognosis, in contrast to the diffuse form. Recurrence has been reported but appears to be uncommon.^{1,8} Although there is a paucity of literature on localized PVS, arthroscopy can be used as an effective diagnostic method to identify localized PVS in the knee.⁹⁻¹¹

Conclusions

We described a case of localized PVS of the knee presenting as a recurring locked meniscal tear in a 40-year-old woman. The patient was treated via arthroscopy to remove the mass, and the diagnosis was confirmed by histological findings. At her most recent follow-up, the patient is doing well, is symptom-free, and has returned to low-level sports participation.

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