Intra-articular Tenosynovial Giant Cell Tumor Arising From the Posterior Cruciate Ligament

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abstract

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Tenosynovial giant cell tumors originate from the synovial tissue of the joints, tendon sheaths, mucosal bursas, and fibrous tissues adjacent to tendons. The disease presents in localized and diffused forms. Large joints, such as the knee, are not frequently affected. Magnetic resonance imaging has been reported to be the best noninvasive technique to diagnose these tumors. Magnetic resonance imaging diagnosis has to be confirmed by histopathological examination. Few reports exist of tenosynovial giant cell tumors arising from the posterior cruciate ligament.

This article describes a case of an 18-year-old man with no history of trauma but with a 2-year history of mild, ongoing, and worsening right knee pain and swelling localized in the popliteal region. Clinical examination of the knee was negative. Magnetic resonance imaging revealed an intra-articular mass measuring 4.8×2.1×2.7 cm in the posterior region of the knee attached to the posterior cruciate ligament. Arthroscopy was performed using the posterior approach through the posterolateral and posteromedial portals. A specimen of the lesion was removed arthroscopically for histopathological examination, and a wide resection of the mass was performed with a shaver and a radiofrequency ablation device. Histopathological examination confirmed the diagnosis of a tenosynovial giant cell tumor. No recurrence had occurred at 2-year follow-up.

Magnetic resonance imaging and histopathological examination may help in achieving a correct diagnosis, and arthroscopic excision using a posterior approach may be the treatment of choice by surgeons.

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Figure: Magnetic resonance images showing an intra-articular mass in the posterior region of the knee arising from the posterior cruciate ligament. It is a well-defined soft tissue density mass with no evidence of ligament and cortical bone involvement. T2-weighted sagittal magnetic resonance image showing a 4.8×2.1-cm well-defined mass hyperintense to the muscles and posterior cruciate ligament (A). T1-weighted magnetic resonance image showing a 2.7×2.1-cm well-circumscribed mass isointense to the muscles and hyperintense to the posterior cruciate ligament (B).
Tenosynovial giant cell tumors originate from the synovial tissue of the joints, tendon sheaths, mucosal bursas, and fibrous tissues adjacent to tendons. The disease presents in localized and diffused forms. It is a rare condition, especially in the localized form. Large joints, such as the knee, are not frequently affected.

This article describes a case of an intra-articular localized tenosynovial giant cell tumor arising from the posterior cruciate ligament (PCL). Few cases of the tumor arising in this location have been reported in literature.

**CASE REPORT**

A healthy 18-year-old man presented with a 2-year history of mild, ongoing, and worsening right knee pain but no history of trauma. He reported a swelling sensation in the popliteal region, mainly after sports (eg, martial arts). Clinical examination revealed no swelling or localized joint-line tenderness around the knee. Lachman test, pivot shift test, anterior and posterior drawer test, and meniscal tear tests were negative. Knee range of motion was complete during extension but limited by mild pain during flexion. Laboratory tests were within normal ranges.

Radiographs of the knee showed no abnormalities. Magnetic resonance imaging (MRI) revealed an intra-articular mass in the posterior region of the knee attached to the posterior cruciate ligament (Figure 1). It was a well circumscribed lesion with no evidence of ligament or cortical bone involvement. The mass, measuring 4.8 x 2.1 x 2.7 cm, was isointense to muscle and hyperintense to the PCL on T1-weighted MRI and was hyperintense to muscle and the PCL on T2-weighted MRI.

Arthroscopy was performed using the posterior approach through the posterolateral and posteromedial portals. Intraoperatively, a yellowish-tan mass arising from the proximal area of the PCL was detected (Figure 2A). A specimen of the lesion was taken arthroscopically for the histopathological examination, and a wide resection of the mass was performed with a shaver and a radiofrequency ablation device (VAPR; DePuy Mitek, Inc, Raynham, Massachusetts). No meniscal, ligament, or articular cartilage lesions were observed. Histopathological examination (Figure 2B) revealed that the lesion was an intra-articular localized form of a tenosynovial giant cell tumor. The postoperative course was uneventful. At 2-year follow-up, the patient appeared to be asymptomatic, and no clinical or MRI evidence of recurrence was noted (Figure 3).

**DISCUSSION**

Tenosynovial giant cell tumors originate from the synovial tissue of the joints, tendon sheath, mucosal bursas, and fibrous tissues adjacent to tendons. The etiology and histogenesis of tenosynovial giant cell tumors are not completely understood. The disease presents in localized and diffused forms. These tumors are generally slow-growing. The incidence in men is 2 times that of women, and the mean patient age at presentation is 30 to 50 years. The intra-articular form occurs almost exclusively in the knee. Masses are usually solitary and well-defined, and joint effusion is usually absent. The pigmented villonodular synovitis represents the diffuse intra-articular form and has a high rate of local recurrence in the extrasynovial localization. Magnetic reso-
nance imaging has been reported to be the best noninvasive technique to diagnose these tumors. Magnetic resonance imaging diagnosis must be confirmed by histopathological examination. The treatment of choice for giant cell tumors is local excision.\textsuperscript{2,4,6} Arthroscopy is a safe and effective procedure for the treatment of these tumors.\textsuperscript{8-11} To the authors’ knowledge, few reports of tenosynovial giant cell tumors arising from the PCL have been published in the literature.\textsuperscript{1,3,5}

Sheppard et al\textsuperscript{1} reported a case of a 47-year-old woman affected by an intra-articular localized tenosynovial giant cell tumor of the tendon sheath arising from the PCL. The authors performed MRI, ultrasonography, ultrasonography-guided fine-needle aspiration cytology surgery, and histopathological examination. They suggested that ultrasonography images are not specific but that MRI findings can be diagnostic. Magnetic resonance imaging helps to differentiate giant cell tumors of the tendon sheath from pigmented villonodular synovitis.

Kim et al\textsuperscript{3} reported a case of 28-year-old man with 5-year history of left knee pain with an intra-articular pigmented villonodular synovitis attached to the PCL. Clinical examination and radiographs were negative. Magnetic resonance imaging revealed a regular contoured mass arising from the PCL. The lesion was removed arthroscopically, and the pathological findings confirmed the diagnosis of localized pigmented villonodular synovitis. No recurrence had occurred at 2-year follow-up. They concluded that arthroscopic local excision of localized pigmented villonodular synovitis is the treatment of choice.

Aksoy et al\textsuperscript{1} reported a case of a 54-year-old woman with a 2-year history of right knee pain and no history of knee injury. Clinical examination and radiographs were negative. Magnetic resonance imaging revealed a regular contoured mass arising from the PCL. The mass was removed arthroscopically. Histopathological examination revealed a tenosynovial giant cell tumor. No recurrence had occurred at 36-month follow-up. The authors concluded that total arthroscopic resection can be an effective surgical technique to remove tenosynovial giant cell tumors.

CONCLUSION

Considering the literature review and the current authors’ recent experience, MRI is the best noninvasive diagnostic technique and is useful in differentiating localized and diffuse forms, and histopathological examination is helpful in confirming the diagnosis. Surgeons should consider the local arthroscopic excision of the tenosynovial giant cell tumors of the PCL as the treatment of choice.

REFERENCES