

Ganglion Cysts of the Posterior Cruciate Ligament

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CASE PRESENTATION

A 52-year-old woman with no significant past medical history presented to our clinic reporting right knee pain. She described the gradual onset of mild pain in the posterior aspect of the knee. The pain worsened with squatting or deep knee flexion. The patient denied trauma, instability, mechanical symptoms, weight loss, and constitutional symptoms. The knee was stable to ligamentous testing, and range of motion was 0° to 120°. A ganglion cyst of the posterior cruciate ligament was identified on magnetic resonance imaging (MRI; Figure). Given the mild degree of symptoms, and lack of impairment in functional status, nonoperative management with close follow-up was elected. Informed consent for print and electronic publication of this case report was obtained.

BACKGROUND

A ganglion cyst is a benign cystic lesion filled with clear mucinous fluid that can arise from several locations, including joint capsules, muscles, tendons, and tendon sheaths.^{1,2} Ganglion cysts most commonly present on the dorsum of the wrist but also may form around the knee.³ These cysts seldom emanate from within the joint itself; the incidence of intra-articular lesions has been reported to be 0.2% to 1.6% on MRI⁴⁻⁷ and 0.6% on arthroscopy.⁸ Studies indicate that 17% to 56% of intra-articular ganglion cysts arise from the posterior cruciate ligament (PCL).^{4,5,8-10}

Ganglion cysts may develop at any age, but men between the ages of 20 and 40 years are most at risk.² The etiology of intra-articular ganglia has not been elucidated but theories include connective tissue degeneration after trauma, synovial tissue displacement during

embryogenesis, proliferation of pluripotent mesenchymal cells, synovial herniation into surrounding tissues, and mucin deterioration of connective tissue.^{4,11}

Cruciate ligament ganglion cysts often are asymptomatic and discovered incidentally.^{1,6,8,9} When symptoms are present, they are nonspecific and include pain, worsening with knee flexion, limited knee flexion and extension, clicking, joint line tenderness, and effusion. Symptoms may be aggravated by physical activity and may mimic other joint pathologies, such as chondral or meniscal lesions.^{2,5,6}

IMAGING

Sonography, computed tomography (CT), arthrography, and MRI may all be used in the evaluation of cystic lesions within the knee.³ Ultrasound is useful in identifying cystic lesions but is limited in its ability to assess the association between cysts and other intra-articular structures.³ CT can detect cysts and other intra-articular pathology but has limited contrast resolution and exposes patients to radiation.³ Arthrography is more invasive than other methods, and visualization of PCL cysts may be difficult with anterior portals.¹² MRI has proved to be the modality of choice, as it offers multiplanar imaging capability and excellent soft-tissue contrast without the limitations of other imaging techniques.^{1,3}

On MRI, ganglion cysts of the PCL appear as well-defined cystic masses, round to lobular in shape, and most often multiloculated. They have uniform low signal intensity on T₁-weighted imaging and high signal intensity on T₂-weighted imaging.^{1,3-5,10} Rim enhancement may be observed on fat-suppressed gadolinium-enhanced T₁-weighted spin-echo images.^{1,5} However, the diagnosis of ganglion cysts usually can be made with use of MRI without contrast.⁵

ARTHROSCOPIC FINDINGS

Ganglion cysts may originate from the anterior or posterior surfaces of the PCL and anywhere along its length.^{1,6,9} Lesions located on the posterior aspect of the PCL may be difficult to visualize using anterior arthroscopic approaches.¹² Therefore, MRI can help guide the arthroscopic approach by identifying cases in which posteromedial or posterolateral portals may be necessary.^{1,6,12} Cysts range from a localized swelling to enlargement of the entire ligament and are often encased in thick, fibrous tissue and synovium. They may leak viscous yellow, serous, or bloody fluid when pierced with a spinal needle.^{6,9}

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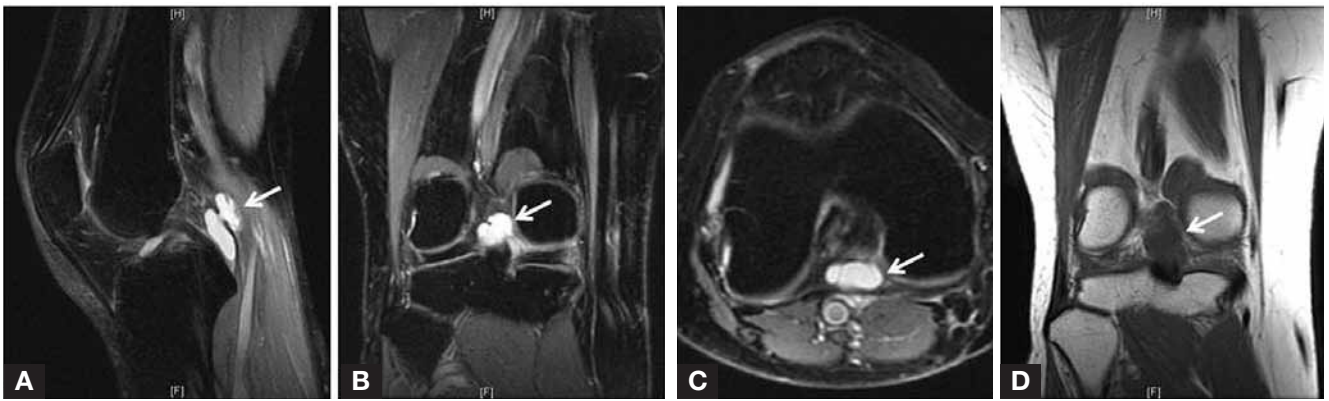


Figure. Sagittal proton-density-weighted (A), coronal (B), and axial (C) fat-saturated, fast spin-echo T_2 -weighted and coronal T_1 -weighted (D) magnetic resonance imaging of right knee shows area of high signal intensity on proton-density and T_2 sequences and low signal intensity on T_1 . This signal abnormality represents a multilobulated ganglion cyst (arrows) of the posterior cruciate ligament with herniation into the posterior capsule.

DIFFERENTIAL DIAGNOSIS

An intracapsular cystic mass of the knee may represent pigmented villonodular synovitis, synovial chondromatosis, synovial sarcoma, a meniscal cyst, or an intra-articular ganglion. These conditions usually can be differentiated on the basis of their characteristic MRI findings^{1,4} and the particulars of the patient history and physical examination.

TREATMENT

There is no consensus on the ideal treatment algorithm for PCL ganglion cysts. Asymptomatic cysts discovered on MRIs do not warrant intervention, but a ganglion found incidentally on arthroscopy may be decompressed or resected to prevent development of symptoms should the cyst expand over time.^{9,11} Symptomatic PCL ganglion cysts may require treatment.⁹ Treatment modalities include open resection, arthroscopic resection,⁸ and ultrasound-¹³ or CT-guided^{7,14} aspiration. Some authors advocate image-guided percutaneous aspiration of cysts as first-line treatment, as it is minimally invasive and provides good outcomes.^{1,14} Others advocate arthroscopic resection, which enables complete cyst removal and allows for treatment of concomitant intra-articular pathologies.^{2,6} Open surgical excision may be performed in cases in which the arthroscopic approach would be limited by the large size of a cyst and the possibility of incomplete resection.¹⁵ Arthroscopic and surgical resection allow for removal of the cyst wall and a theoretical decrease in risk for recurrence.¹⁶ However, with the exception of the rare report of recurrence after both percutaneous drainage and arthroscopic resection,¹⁴ recurrence of intra-articular ganglion cysts is unusual with either therapeutic modality.^{2,4,6-9,13,15}

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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