

> THE PATIENT

36-year-old man

> SIGNS & SYMPTOMS

- Left knee pain when squatting
- No mechanical symptoms (catching, popping, or locking)
- No previous injury or trauma to the area

> THE CASE

A 36-year-old man sought care at our family medicine clinic for knee pain that he'd had for the past year. He denied any previous injury or trauma to the knee. The pain affected the posterolateral left knee and was aggravated by squatting and deep flexion. Daily activities did not bother him, but skiing, golfing, mountain biking, and lifting weights worsened the pain. His pain had gradually become more severe and frequent. He denied any mechanical symptoms such as catching, popping, or locking.

Examination of his left knee demonstrated range of motion from 0 to 120 degrees; further flexion caused significant pain. McMurray and Thessaly tests were positive for posterolateral pain, particularly with knee flexion >120 degrees. Physical examination was otherwise unremarkable. Standard x-rays of the left knee were normal. Our patient completed a month of physical therapy, but his symptoms did not improve.

THE DIAGNOSIS

After the patient completed physical therapy, magnetic resonance imaging (MRI) was performed. The MRI did not reveal any left knee effusion, and the menisci, collateral ligaments, and cartilage surfaces were normal. And, while the cruciate ligaments were intact, a large pericruciate ganglion cyst was noted (FIGURES 1 AND 2).

DISCUSSION

Ganglion cysts are dense, encapsulated structures filled with clear viscous fluid that often arise adjacent to tendon sheaths or joint capsules, most commonly over the dorsum of the hand.¹ Intra-articular ganglia involving the cruciate ligaments of the knee are relatively uncommon.² The estimated prevalence of cruciate ligament ganglion cysts at arthroscopy is 0.2% to 1.9%; similar rates have been demonstrated with MRI.³⁻⁶ There are more reported cases of these cysts involving the anterior cruciate ligament (ACL) compared to those affecting the posterior cruciate ligament (PCL).^{2,6}

Classification of these cysts is based on relative location with respect to the ligaments. Type 1 cysts originate anterior to the ACL; type 2, between the ACL and PCL; and type 3, posterior to the PCL.^{6,7} Cruciate ligament ganglion cysts are more common in men, are typically discovered between age 20 and 40, and are usually incidental findings.⁸

The pathogenesis of ganglion cyst formation is unknown.^{1,6,7} The most widely accepted theory is that ganglion cysts result from mucinous degeneration of connective tissue in areas of repetitive stress.^{1,6,7} Other theories suggest hyaluronic acid production secondary to mesenchymal stem cell proliferation within the ligaments, synovial tissue herniation, or congenital translocation of synovial tissue as possible etiologies.^{2,6,7}

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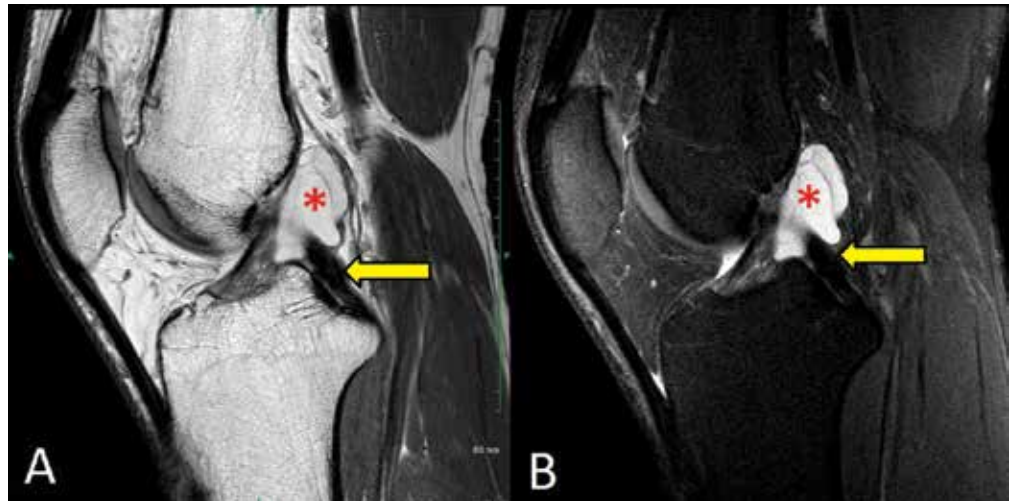
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FIGURE 1

MRI revealed the presence of a pericruciate ganglion cyst

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Sagittal proton density fast spin echo (A) and proton density fat-suppressed (B) magnetic resonance images of the left knee demonstrated a lobular high T2 signal mass (asterisks) adjacent to the posterior cruciate ligament (yellow arrows).

Concurrent pathologies such as meniscal tears or chondral lesions may also be present; however, there is some disagreement as to what role, if any, antecedent trauma has in the pathogenesis of cyst formation.^{1,6} Several investigators have suggested that prior knee trauma is a likely risk factor.^{2,8,9}

In most patients, cruciate ligament ganglion cysts are asymptomatic.⁷ The most common presenting symptom is nonspecific pain that is exacerbated by activity, such as stair climbing, squatting, or other activities that require extreme flexion or extension of the knee.^{6,9} Other possible symptoms include limited range of motion (extension block with ACL involvement, limited flexion with PCL lesions), a catching or locking sensation, instability, or joint line tenderness.^{5,6} A palpable mass on physical exam is not usually present.⁶ Some investigators suggest that larger lesions and those closer to the femoral ligamentous attachments are more likely to cause symptoms.⁵

Cruciate ligament ganglion cysts can be an easily overlooked source of a patient's symptoms because they often mimic more common pathologies.² The differential diagnosis of cruciate ligament ganglion cysts and posterior knee pain includes any other

intra-articular cysts (eg, meniscal cysts), posterior meniscal tear, popliteus tendinopathy, or neoplasms (eg, hemangioma and synovial sarcoma).^{2,6}

MRI is the best method of diagnosis

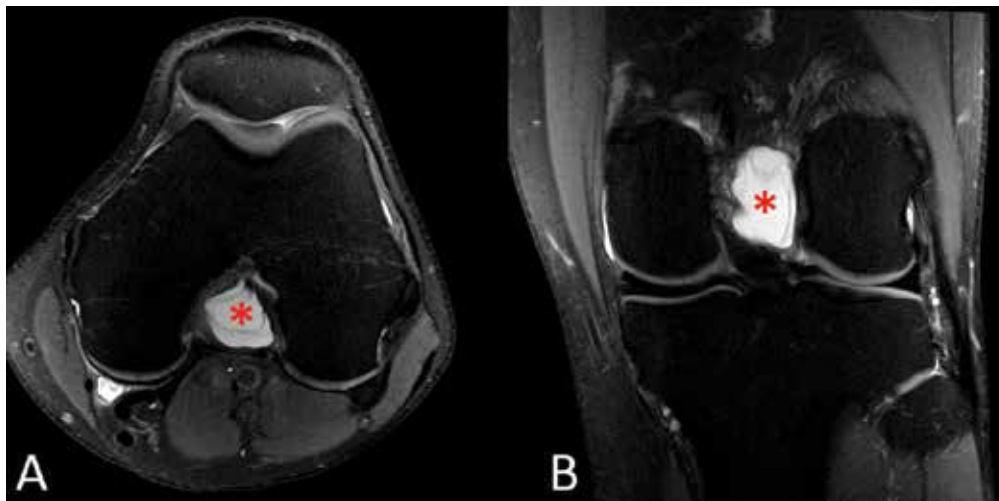
Because the symptoms of cruciate ligament ganglion cysts are variable and nonspecific, the diagnosis is rarely made on clinical grounds alone.¹ The best method of evaluating suspected intra-articular pathologies such as cruciate ligament ganglion cysts is MRI.^{5,10}

Cruciate ligament ganglion cysts typically follow fluid signal on all sequences, with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images.^{1,2,5,6} A pericruciate location with a multilocular appearance is usually sufficient evidence to make a diagnosis. However, solid or semi-solid pathologies (such as synovial cell sarcoma, synovial hemangioma, or synovial chondromatosis) can have similar signal intensity.

If necessary, intravenous contrast can be helpful; a lack of central contrast enhancement can differentiate ganglion cysts from other solid, enhancing, or partially enhanc-

FIGURE 2

Further MRI testing confirmed the diagnosis



Proton density fat-suppressed axial (A) and coronal (B) magnetic resonance images of the left knee confirmed a lobular high T2 signal pericruciate ganglion cyst (asterisks).

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Cruciate ligament ganglion cysts are more common in men and are usually incidental findings.

ing lesions. Other diagnostic modalities, such as ultrasound, computed tomography (CT), and diagnostic arthroscopy, are less practical and have a wide range of sensitivity and specificity.^{5,6,10}

Arthroscopic excision is the treatment of choice

Asymptomatic cruciate ligament ganglion cysts are usually managed with clinical follow-up. For patients with symptomatic cysts, ultrasound- or CT-guided percutaneous cyst aspiration may temporarily improve symptoms, but recurrence rates have not been well studied.^{2,6,9,10} Additionally, accessibility to cysts in this location via these approaches is limited. Arthroscopic excision of the cyst is the treatment of choice for symptomatic cases.^{1,2,5,6,10}

■ **Our patient** underwent arthroscopic cyst resection, which resulted in complete resolution of his symptoms. In 3 months, he returned to his regular physical activities with no pain or discomfort. One year later, he remained asymptomatic.

THE TAKEAWAY

Cruciate ligament ganglion cysts are a rare

cause of posterior knee pain. An MRI is the best diagnostic modality to evaluate and confirm the diagnosis, as well as rule out other pathologies. The treatment of choice for symptomatic cases is arthroscopic excision of the cyst. **JFP**

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