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Skeletal Radiology

Case report 677*

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Imaging studies

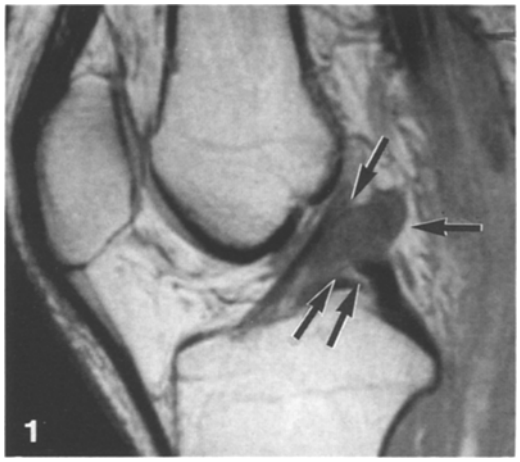

Fig. 1. A sagittal T_1-weighted magnetic resonance (MR) image (TR 1000/TE 20) of the knee shows a well-defined (25 × 12 mm), round mass (*arrows*) localized at the posterior aspect of the posterior cruciate ligament

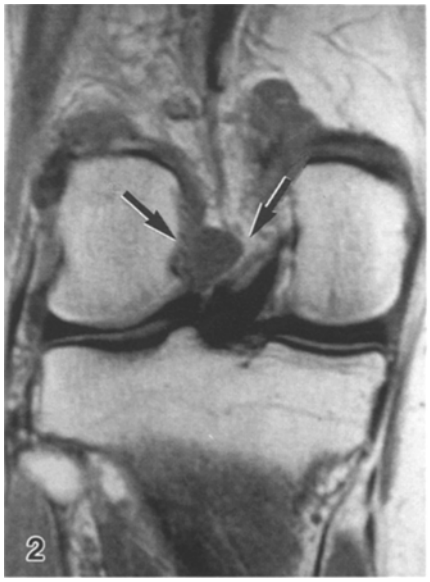

Fig. 2. A coronal T_1-weighted MR image demonstrates the mass (*arrows*) adjacent to the posterior cruciate ligament

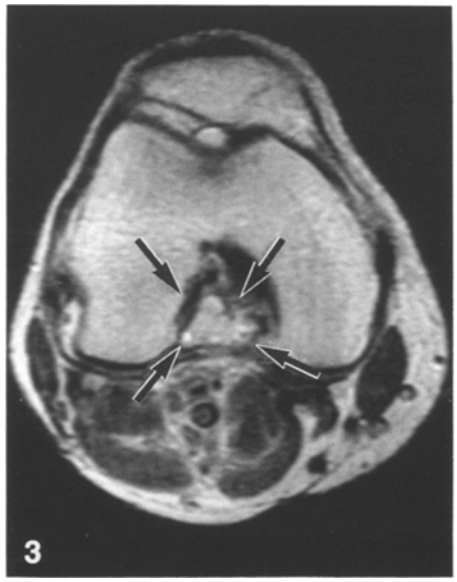

Fig. 3. A transaxial T_2-weighted MR image shows a mass of 15 mm (*arrows*) arising from the proximal third of the posterior cruciate ligament

Clinical information

A 39-year-old man presented with right posterior popliteal tenderness and a sensation of "fullness" of 6 months' duration. The past medical history revealed two episodes of deep venous thrombosis. There was no past history of trauma to the knee.

Physical examination revealed a normal range of motion of the hips, knees, and ankles, except that the patient lacked the final 15° of flexion of the right knee. Lachman's sign and McMurray's click were negative. A small effusion and some fullness in the popliteal fossa were noted in the right knee.

Plain films were essentially normal. Magnetic resonance imaging (MRI) demonstrated a smooth, rounded, sharply demarcated, intraarticular mass in the right knee (Fig. 1). It measured 25 × 15 × 12 mm and was located lateral and dorsal to the proximal part of the posterior cruciate ligament. On T_1-weighted images (TR/TE 1000/20), the mass was slightly hypointense compared with muscle (Fig. 2). It showed an increased signal on proton density images (TR/TE 1000/75) (Fig. 3).

Arthroscopy was done with aspiration of gelatinous material, and biopsy of the cyst wall, which originated from the posterior cruciate ligament, was performed (Figs. 4, 5).

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Diagnosis: Intraarticular ganglion arising from the posterior cruciate-ligament

Discussion

Periarticular synovial cyst and other cystic masses are most commonly seen around the knee, which has the largest synovial membrane of any joint. The gastrocnemii-semimembranous cyst (Baker's cyst) is the most common cystic lesion found around the knee [8], but others may be encountered.

Using double contrast arthrography and computed tomography (CT) evaluation of cystic lesions around the knee, investigators have found that 50% of the lesions are Baker's cysts, 13% are antefemoral cysts, 8% are synovial hemangiomas, 8% are hematomas, and the rest consist of popliteal aneurysms, malignant lesions, and ganglionic cysts [6]. Arthrography is an accurate method for diagnosing communicating synovial cysts and detecting their causative joint diseases. CT complements arthrography in the diagnosis of noncommunicating synovial cysts, ganglia, or other less common cystic masses (abscesses, popliteal aneurysms, varices, and malignant soft-tissue tumors).

Recently, MRI has been advocated by some investigators as the best method in evaluating cystic lesions of the knee [2]. These authors described the MR analysis of 16 cystic lesions of the knee. They found 11 meniscal cysts and 5 ganglionic cysts. All of the former were associated with horizontal meniscal tears, whereas none of the ganglia revealed this association. The ganglia were localized in the vastus lateralis or semimembranous muscles, the tibiofibular joint, or medial or suprapatellar locations. Cysts in the last three locations communicated with the capsule of the knee joint.

It is evident that ganglia around the knee are not common, and those located in the joint are rare. Only seven cases of ganglia arising from the cruciate ligament have been described. Caan described one in the midportion of the anterior cruciate ligament in a cadaveric dissection derived from a elderly man who had no symptoms [3]. In 1943, a young woman with a 10-year history of effusion of the knee and antecedent trauma was found at arthrography to have a ganglion of the posterior cruciate ligament with partial avulsion of its tibial insertion [9]. Levine reported a 23-year-old man who had sustained a twisting injury of the knee 3 years previously; the patient had pain, effusion, and locking during extension of the joint [7]. Arthrotomy was performed, and a ganglion in the lower third of the anterior cruciate ligament was found. Bromley and Cohen described a fourth case, that of a 29-year-old man with a his-

Pathological studies

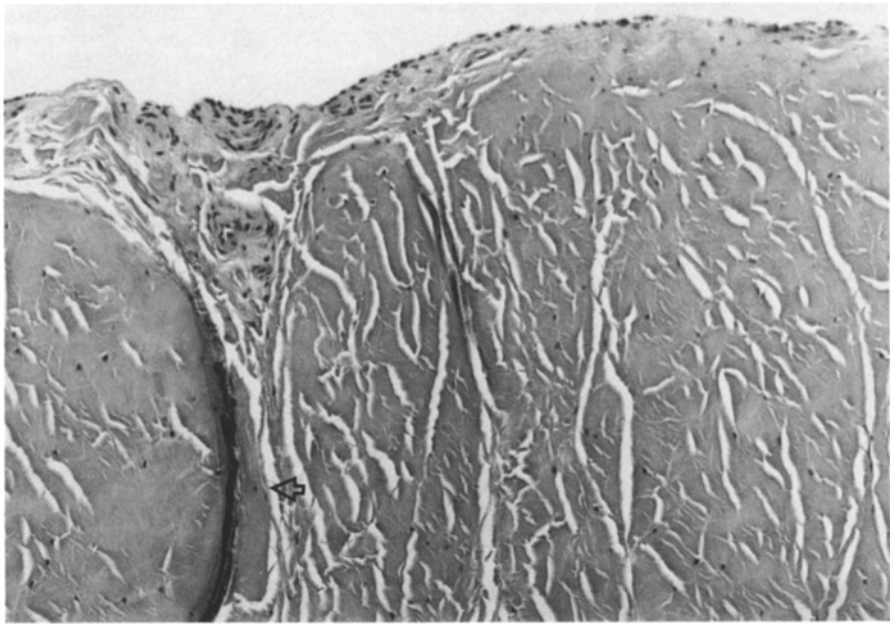

Fig. 4. A low magnification photomicrograph shows the ligamentous collagen, depicting on the right side of the photograph an area of homogenized, degenerated collagen. The interface between this and normal collagen is indicated by an *arrowhead* (H&E ×40)

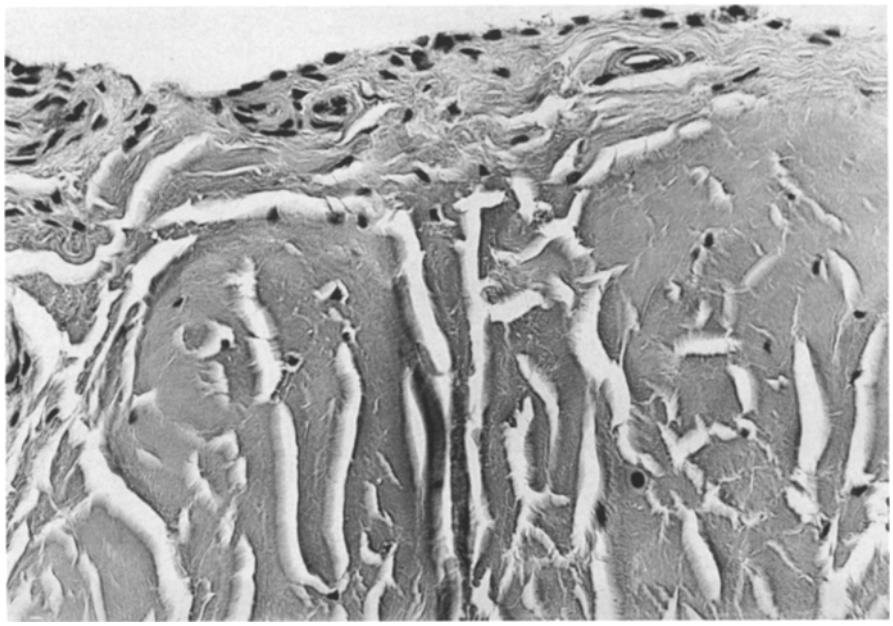

Fig. 5. A higher magnification photomicrograph shows attenuated synovial lining over the ligament. (H&E ×100)

tory of an automobile accident 8 months before; the patient presented with pain and limitation of the knee upon flexion [1]. During surgery, a ganglion of the posterior cruciate ligament was excised. In 1988, Chang and Rose portrayed a young woman with pain and effusion for 2 weeks without previous trauma; arthroscopy was carried out for a presumed diagnosis of meniscal tear, but a ganglion of the anterior cruciate ligament was found and excised [4]. Yasuda and Majima reported a woman with locking and loss of 20° of extension of the knee; arthroscopy with excision of a ganglion of the proximal third of the anterior cruciate ligament was performed [10]. In the last case, CT was used to investigate a young patient with a history of pain, effusion, and locking during extension of the knee, who had no antecedent history of trauma [5]. Routine radiography demonstrated a radiolucent area in the medial femoral condyle. The bone scan was negative, and CT study demonstrated an intercondylar soft-tissue mass which was believed to originate from the anterior cruciate ligament. During arthroscopy, an erosion of the femoral condyle and a ganglion of the femoral insertion of the posterior cruciate ligament were found.

Our report seems to be the first case in which an accurate diagnosis was established preoperatively with MRI. We believe that the evaluation of cystic lesions around and in the knee with MRI is very useful in establishing the diagnosis.

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