Dorsal defect of the patella and infection

J. E. Alexander¹, J. J. Seibert¹ and J. Aronson²

¹ Departments of Radiology and ²Orthopedics, Arkansas Children's Hospital, Little Rock, Arkansas, USA

Abstract. Lesions of the patella are relatively rare, although a large variety of etiologies have been reported. To our knowledge this is only the second reported case of a Brodie's abscess of the patella. Its radiologic appearance was identical to that described for the common dorsal defect of the patella.

Case report

This 13-year-old white female initially presented with bilateral knee pain, associated with regular athletics. After a regimen of quadriceps conditioning exercises, she returned to competitive basketball.

One month later she developed a spontaneous left knee effusion. The knee examination revealed a moderate effusion with patello-femoral crepitus, no erythema or warmth and a full range of motion.

Plain films (Figs. 1, 2) of the knee revealed a well defined, rounded, one centimeter lytic lesion in the upper lateral aspect of the patella. The lesion had a sclerotic border and abutted the dorsal articular surface of the patella. The triple phase bone scan showed increased activity in the flow, blood pool, and delayed images (Fig. 3). The remainder of the skeleton was normal. The sedimentation rate and white blood cell count were normal.

Since symptoms did not resolve over several weeks, the family requested diagnostic surgery. A large suprapatellar plica was arthroscopically lysed but no other intra-articular abnormalities were seen. An open biopsy revealed a cystic cavity. Serous contents were cultured and the soft tissue lining membrane curetted to viable bone. The arthroscopic synovial biopsy showed chronic inflammation but cultures of the cyst remained negative. Her symptoms completely resolved after three weeks of empirical anti-staphylococcal antibiotics.

Discussion

Review of the literature reveals a diverse variety of bony lesions of the patella, including dorsal defect of the patella (DDP) [1-4], chondroblastoma, aneurysmal bone cyst, osteoid osteoma, lymphoma, hemangioma, cystic tuberculosis, osteomyelitis, osteogenic sarcoma, metastatic lesions, intraosseous ganglion cyst, unicameral bone cyst, eosinophilic granuloma, osteochondritis dissecans, giant cell tumor, and one case of Brodie's abscess [5].

Brodie's abscess, first described by Sir Benjamin C. Brodie in 1832, represents a chronic, localized, walled-off area of osteomyelitis. It is normally not associated with sequestrum, sinus tract formation or periosteal reaction, and is most commonly located in the metaphysis of the tibia or femur.

The insidious onset of symptoms is rarely preceded by a history of infection or injury. Patients are usually skeletally immature and present with episodic pain, often worse at night. Swelling, tenderness, and erythema may not be present.

Radiologically, Brodie's abscess presents as a well defined area of lucency, surrounded by a zone of sclerosis, usually eccentrically located in the metaphysis.

Pathologically, cultures are usually negative due to the chronicity and walled-off nature of the lesions. When cultures are positive, Staphylococcus is the most frequently cultured organism. The abscess is lined by granulation tissue, infiltrated by leukocytes and plasma cells and separated from surrounding bone by a layer of fibrin. The fluid may be purulent, oily, or mucoid [5].

In our case, a diagnostic dilemma existed as to whether the lesion represented a benign dorsal defect of the patella or more ominous pathology, since DDP requires no further work up.

DDP is present in about 1% of the population and may be found from preadolescence to mature adults [3]. Radiographically, DDP presents as a rounded, well defined, lucent lesion with sclerotic borders, always located along the superior lateral
Fig. 1. AP view of the left knee shows a well circumscribed lytic lesion in the superior lateral aspect of the patella with a sclerotic border (arrow).

Fig. 2. Lateral close up of the left patella again shows the well demarcated bony lesion in the superior portion of the patella. The posterior margin abuts the articular surface (arrow).

The border of the patella, adjacent to the articular cartilage [4]. DDP may show increased activity on bone scan, especially in symptomatic patients [1, 2].

Pathologically, the articular cartilage is always intact. Biopsy of DDP reveals nonspecific repair without inflammation [4]. Microscopic exam reveals viable spicules of bone separated by fibrous tissue. Lymphocytes are found but not giant cells [1].

DDP is radiographically similar to osteochondritis dissecans, but DDP always has an intact articular cartilage and no loose bodies. Osteochondritis dissecans (OD) is located on the intercondylar ridge of the patella rather than the superior lateral aspect. Also, DDP often shows spontaneous healing while OD does not [4].

It has been stated that the radiographic characteristics of DDP are specific enough that no further evaluation is necessary [1]. In our case, the typical lytic lesion surrounded by sclerosis was located in the superior lateral aspect of the patella and positive on bone scan. All findings were compatible with a diagnosis of DDP, except for the presence of an effusion, which has not been described in DDP. Symptoms of DDP often include aching about the patella or quadriceps tendon insertion, which may persist for several years after discovery of the lesion [2].