Paget’s disease of the patella *

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Abstract. Five patients with Paget’s disease involving the patella were evaluated for the following radiographic features: trabecular pattern, cortical integrity, density, and size of the affected patella. Radiographic appearances consisted of minimal trabecular coarsening in the patella of nearly normal size and progressed to considerable cortical thickening and osteoblastic remodeling in a dramatically enlarged patella. The radiologic features of Paget’s disease of the patella are distinctive and should obviate biopsy.

Key words: Paget’s disease – Patella

Paget’s disease of bone (osteitis deformans) is a common skeletal disorder of unknown etiology, characterized by excessive and abnormal osseous remodeling. Although typically polyostotic, it may be totally monostotic in 10%–35% of patients [6]. The most commonly involved skeletal sites are the pelvis, lumbar spine, skull, and proximal femur [1, 5, 6, 8], where the disease exhibits characteristic radiographic features. Though patellar involvement is rare [1–8], its radiographic appearance is distinctive, obviating biopsy. This study illustrates the radiographic spectrum of Paget’s disease of the patella. To the best of our knowledge, none of these patients has been previously reported.

Materials and methods

A retrospective review of 350 patients with Paget’s disease of bone in our radiologic archives yielded 5 patients with patellar involvement. Three of these 5 were pathologically proven according to commonly accepted histologic criteria, including active osteoclastic resorption coexisting with osteoblastic new bone apposition in the active phase and formation of stout long trabeculae with a mosaic architecture in the advanced phase. When viewed in the context of polyostotic distribution, the radiographic findings were considered sufficiently diagnostic to preclude biopsy in the 2 remaining patients.

The following additional data were recorded: age and sex of the patient, lateralization to the right or left patella, presenting symptoms, serum alkaline phosphatase level, and monostotic or polyostotic distribution of the disease. All available radiologic images were assessed to determine the size, contour, density, and trabecular pattern of the affected patella.

Results

The five patients averaged 60 years of age at presentation (range 29–83 years). All but one were over 50. There were three male and two female patients. The left patella was affected in three and the right patella, in two.

Clinical data were available for four. Symptoms included swelling and crepitus of 4 months’ duration in one patient; knee pain of unknown duration in one patient; and persistent pain after a fall in two patients. One of the latter two patients sustained a fracture of the inferior pole of the patella. He subsequently admitted chronic mild pain, sometimes associated with heat or swelling, for at least 3 years before the injury. The serum alkaline phosphatase level was available for three patients; it was moderately elevated in two (170 with upper limits of normal 110, and 163 with upper limits of normal 85) and slightly elevated in one (42 with upper limits of normal 35).

In one patient, radiographs of other bones were reported as showing no evidence of Paget’s disease. This patient presumably has monostotic disease. It is unknown whether two other patients had Paget’s disease in other sites. Polyostotic disease was detected in the remaining two patients in whom radiographs and/or radionuclide bone scan demonstrated characteristic pagetoid involvement of the innominate bone. Additional pagetoid changes were also evident radiologically in the lumbar spine, femur, and humerus in one of these patients.

* The opinions and assertions contained herein are the private views of the authors and do not reflect the views of the Department of the Army or of the Department of Defense

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Radiographs of the patella were available for all patients and demonstrated variable amounts of trabecular coarsening, cortical thickening, and enlargement of the involved patella. In two patients, there was minimal enlargement of the patella in association with a coarsened trabecular pattern, interspersed areas of rarefaction, minimal cortical thickening, and a relatively preserved external contour (Fig. 1). Moderate enlargement of the patella was encountered in two patients (Fig. 2), in whom cortical thickening and patchy areas of sclerosis were also identified. In one patient there was massive enlargement of the patella with irregular cortical thickening and coarse trabeculation (Fig. 3). Bone density patterns were predominantly mixed lytic/blastic in three patients and predominantly blastic in the remaining two (Table 1).

Coexistent degenerative joint disease of the patellofemoral articulation was present in four patients. Radiographically, the severity of arthritic change paralleled the degree of patellar enlargement.

Patellectomy was performed in three patients. On gross examination the patella was found to be minimally enlarged in two; the third had moderate patellar enlargement and a fracture through the inferior pole. Typical histologic changes of early Paget's disease were seen in one. Features characteristic of the active phase of the disease were apparent in another (Fig. 4) and were indistinguishable from the appearances in more typical sites of pagetic involvement. In the third patient, only a report of the histology was available because the original slides could not be located.

**Discussion**

Paget's disease is commonly encountered in middle-aged and elderly individuals and has a slight male predominance [1, 5, 6, 8]. It is uncommon before age 40, but its incidence increases with advancing age [1, 5, 6, 8]. Most patients are asymptomatic.

The characteristic radiographic appearance of Paget's disease in common skeletal locations has been well described [1, 5, 6, 8]. In these circumstances, the diagnosis is readily established from analysis of the radiographs.

Involvement of the patella is rare in both polyostotic and monostotic Paget's disease [1–8]. Patellar involvement usually results in knee pain, attributable either directly to the disease or to its complication, degenerative patellofemoral arthritis [2–4, 7]. The radiographic find-

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**Table 1. Data concerning Paget's disease of the patella**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Sex</th>
<th>Side</th>
<th>Patellar size</th>
<th>Trabecular pattern*</th>
<th>Symptoms</th>
<th>Alkaline phosphatase b</th>
<th>Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>M</td>
<td>L</td>
<td>Minimally enlarged</td>
<td>M</td>
<td>Effusion, crepitus</td>
<td>–</td>
<td>Patellectomy</td>
</tr>
<tr>
<td>54</td>
<td>F</td>
<td>R</td>
<td>Minimally enlarged (Fig. 1)</td>
<td>M</td>
<td>Pain, tenderness</td>
<td>42 (10–35)</td>
<td>Patellectomy</td>
</tr>
<tr>
<td>63</td>
<td>M</td>
<td>R</td>
<td>Moderately enlarged</td>
<td>B</td>
<td>Chronic pain, acute lower pole fracture</td>
<td>163 (85)</td>
<td>Patellectomy</td>
</tr>
<tr>
<td>69</td>
<td>M</td>
<td>L</td>
<td>Massively enlarged (Fig. 3)</td>
<td>M</td>
<td>Pain</td>
<td>–</td>
<td>Radiographic (polyostotic)</td>
</tr>
<tr>
<td>83</td>
<td>F</td>
<td>L</td>
<td>Moderately enlarged (Fig. 2)</td>
<td>B</td>
<td>–</td>
<td>170 (110)</td>
<td>Radiographic (polyostotic)</td>
</tr>
</tbody>
</table>

* B, predominantly blastic; M, mixed lytic/blastic; b Normal range or upper limits of normal in parentheses