

Groin pain

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Answer

Diagnosis: intracortical lipoma 2

Discussion

Intracortical lipoma is a rare benign lesion consisting of a focal accumulation of adipocytes in the cortex of bone. It represents an intraosseous lipoma located in the cortex, in contrast to the typical location in the medullary cavity of the involved bone. Intraosseous lipomas represent <0.1% of primary bone tumors [1], and commonly occurs during the fourth and fifth decades of life with a slight male predominance [2]. Intracortical lipoma is much rarer, with only six cases reported in the literature [1, 3–6].

The majority of cases of intraosseous lipomas present with pain, although more than 30% are found incidentally on imaging studies performed for other reasons [7]. The general radiographic differential diagnosis for intraosseous lipoma includes non-ossifying fibroma, simple bone cyst, fibrous dysplasia, enchondroma, aneurysmal bone cyst, bone infarct and acute osteomyelitis [7].

Histologically, an intraosseous lipoma consists of mature adipose tissues, admixed with variable foci of fat necrosis, calcification, and myxoid degeneration [3]. Milgram proposed three stages based on the histological appearances of intraosseous lipomas: stage 1, tumors of viable fat cells; stage 2, transitional cases composed partly of viable fat cells but

also demonstrating fat necrosis and calcification; and stage 3, lesions demonstrating necrotic fat, calcification of necrotic fat, variable degrees of cyst formation, and reactive woven bone formation [8]. Each stage has corresponding characteristic radiologic features. Stage 1 lesions are purely radiolucent with resorption of pre-existing bone and minimal expansion or remodeling [8]. In stage 2 lesions, localized areas of calcification, typically centrally located, may be seen. In stage 3 lesions, reactive ossification peripherally or centrally located around the calcified fat is noted. [8]. Radiographs may demonstrate an osteolytic bone lesion with well-defined margins or may appear normal. The identification of fat density on CT or MRI is usually considered diagnostic of an intraosseous lipoma [7]. The fat component of the intraosseous lipoma follows fat signal on all MRI pulse sequences. Areas of low signal which correspond to calcification and ossification on radiographs can be seen, and represent the sequela of fat necrosis. Foci of central fluid typically indicates fat necrosis. Marginal sclerosis is manifested by a rim of low signal on all pulse sequences [7].

Intraosseous lipomas occur most frequently in the intertrochanteric or subtrochanteric portions of the proximal femur, fibula, tibia, calcaneus, and the vertebral body [5, 9]. Long bone lesions typically occur in the metaphysis with diaphyseal and epiphyseal involvement unusual [5].

Of the six cases of intracortical lipoma previously reported, four were located in the femoral diaphysis, one in the tibia diaphysis and one in the tibia metaphysis. The lesions appear similar on imaging to intramedullary lipomas, with a well-defined lucent cortical lesion on radiographs, and with T1 hyperintensity and homogenous fat suppression on fat suppressed T2-weighted images on MRI. The lesions are typically completely enclosed within the cortex, may be eccentric and expansile (as in this case), with no connecting tract to the intramedullary space (precluding post traumatic entry of

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fat into the cortex as the etiology). The homogenous fat signal intensity and purely intracortical location helps to differentiate this lesion from another cortically based lesion, osteofibrous dysplasia (ossifying fibroma), which shows more signal heterogeneity, and from another fatty lesion, parosteal lipoma, which arises from the surface of bone rather than within the cortex. A very rare cause of intracortical fat is post-fracture cystic lesion which could be seen transiently after a fracture [10]. Of the reported cases of intracortical lipoma, all demonstrated homogenous fat signal intensity with no areas of fat necrosis or signal heterogeneity, and no aggressive features such as periosteal reaction or soft tissue mass [6].

Intraosseous lipomas are not progressive and may actually undergo spontaneous involution [11]. There are extremely rare cases of malignant transformation to liposarcoma or malignant fibrous histiocytoma [10]. The diagnosis could be made with fine needle aspiration, but is rarely indicated as the imaging characteristics are diagnostic (as in this case). Treatment is only indicated in the presence of symptoms or bone instability, with curettage and bone grafting as options.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest

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