LESSON OF THE MONTH

Apparent hip osteoarthritis in a 16 year old girl

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Case report

A 16 year old girl developed insidious left groin pain after an 18 month period of limping before being seen in the department of rheumatology. No other complaint or remarkable history was noted. Pain was relieved by bed rest but was worse at night in particular after sport practice at school. Non-steroidal anti-inflammatory drugs (diclofenac, 75 to 100 mg/day) and analgesics (paracetamol, 2 to 3 g/day) were both effective. Physical examination revealed only decreased internal rotation of the left hip joint (5°) and atrophy of the left thigh (a 2 cm decrease in the

circumference). Initial pelvic *x* rays performed nine months after onset were normal. Technetium-99m bone scan performed six months after initial *x* rays showed diffuse increased uptake over the hip including the femoral head, femoral neck, and acetabulum (fig 1A). Magnetic resonance imaging (MRI) showed decreased bone marrow signal intensity on T1 weighted images and increased signal intensity on T2 weighted images in the femoral neck with joint effusion. These changes were interpreted as depicting a possible stress fracture. However, computed tomography with 4 mm contiguous sections

Figure 1 (A) and (B) Fifteen months after onset, technetium-99m bone scan images. The standard view of pelvic area (A) showed diffuse increased uptake as in acetabulum as in femoral head and neck; the focus view of the hip (B) showed a small hot spot among the increased uptake area. (C) Eighteen months after onset. Anteroposterior pelvic *x* ray showing a small osteophytosis ring the femoral head. A faint osteosclerosis of the upper slide of the femoral neck can be noted (arrow). (D) Eighteen months after onset. Computed tomography of the left hip, showing fat osteosclerosis around a small and round tissue (nidus) in the cortex of the femoral neck, corresponding to osteoid osteoma, and small osteophytes ring the femoral head.

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Accepted for publication
18 March 1997

showed only joint effusion. On admission, a new pelvic x ray showed a 1 mm joint space narrowing with osteophytes ringed the femoral head and diffuse articular osteoporosis (fig 1C). Erythrocyte sedimentation rate was 16 mm/1st h and antinuclear antibodies, rheumatoid factor, and HLA B27 were negative. Biochemical analysis of synovial fluid sample showed a normal cellular pattern. In the absence of an explanation for this early hip osteoarthritis without hip dysplasia, all previous imaging investigations were very carefully reviewed. Rigorous analysis of pinhole view of scintigraphy disclosed a small area in the left femoral neck with mildly increased activity (fig 1B). This scintigraphic focus corresponded on MRI to a small defined area of low intensity signal on T1 and T2 weighted images, initially undiagnosed among the extensive changes in the bone marrow fat signal. After correlation with these images, faint endosteal sclerosis in the femoral neck was seen on routine x rays (fig 1C). Thus, computed tomography with millimetric slices, focused on these abnormalities, was performed. It showed a typical small osteoid osteoma of the anteromedial cortex of the femoral neck (fig 1D). Surgical removal of this intracapsular lesion was carried out, leading to rapid disappearance of pain and complete recovery of hip mobility in one month. Histopathological examination of the lesion confirmed a typical aspect of osteoid osteoma (OO), with a well circumscribed nidus constituted by woven bone and mainly osteoid and blood vessels, surrounded by extensive osteosclerosis where woven bone predominates.

Discussion

OO is a benign skeletal neoplasm originally described by Jaffe in 1935.¹ It accounts for 11% of all benign bone tumours and generally occurs in patients between 10 and 30 years of age.² Any bone can be involved, although diaphyses of the femur and the tibia are the most common locations.

Intra-articular locations have been more rarely reported.² These intra-capsular OO have an unusual clinical and radiological presentation leading to erroneous or delayed diagnosis.² Indeed, their clinical course, including articular pain and limitation of joint motion with joint swelling, overlaps that of many articular diseases.^{2,3} Pain and other symptoms may antedate radiological detection of OO by months.^{4,5} Moreover, the first radiological signs can be non-specific, such as a juxta-articular osteoporosis,^{2,5} which is compatible with inflammatory arthritis as well as reflex sympathetic dystrophy.

Furthermore, in these intra-articular locations, other imaging, in particular bone scintigraphy, are less accurate than in the usual osseous sites for identification of the nidus.⁴⁻⁷ Regional reactive hyperaemia is a well known isotopic feature in intra-articular OO.^{4,5} However, this hallmark remains misleading for two reasons: it is indistinguishable from reflex sympathetic dystrophy or arthritis and it masks the local hot spot corresponding to the

nidus.^{3,5,8} As we observed, pinhole views may be necessary to identify the nidus. MRI may also be confusing, as the lesion can be missed among intramedullary changes.^{6,7,9} Computed tomography examination remains the best means of demonstrating the precise anatomy of the nidus and guiding its surgical removal.⁹ Millimetric slices may be necessary, as computed tomography may fail to detect small lesions.⁶ A careful scrutiny of the imaging is thus needed for an early diagnosis of intra-articular OO.

A radiographic osteoarthritic feature with cartilage space narrowing and osteophyte formation has been rarely reported.^{3,5,10} This radiographic feature increases the misleading characteristics of the intra-articular locations. Sherman in 1947 was the first to comment on osteoarthritic changes in two cases of OO.¹⁰ More recently, Cassar-Pullicino and colleagues in a series of 12 intra-articular OO noted joint space narrowing in only one case and osteophytes in three cases on routine radiographs.⁵ Norman and colleagues noted, however, 50% of premature osteoarthritis in 30 cases of intra-articular OO.³ Thus, the osteoarthritic pattern might be not so rare in intra-articular locations of OO. Several histopathological observations described real synovitis associated with intra-articular OO, either a mild chronic non-specific synovial reaction^{3,11} or lymphofollicular synovitis mimicking rheumatoid synovitis.^{12,13} This synovitis could result from local T cell mediated activation in reaction against a tumoral antigen or induced by direct release of mediators from OO.¹³ Indeed, high synthesis of prostaglandin E₂ by OO itself has been demonstrated.¹⁴

The lessons

- Intra-articular OO should be considered early in an adolescent or young adult with symptoms of hip involvement and with apparent normal x ray.
- Intra-articular OO should be considered in a young adult with an isolated osteoarthritis feature on the pelvic x ray
- Bone scan with pinhole views or millimetric computed tomography could be necessary for the diagnosis of intra-articular OO.

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Vesalius 1543: The second plate of the muscles. "The second plate corresponds entirely to the first since it concerns the dissection, which has been turned to the side to display the same muscles as the former, together with the bony regions, prominent on the surface and somewhat excarnate. Therefore almost the entire surface, as well as the head since it is osseous in only a little less than its entirety, is consequently indicated by very few letters."