

Idiopathic bilateral acetabular labral ossification

Jyoti Kumar, Suman Bandhu, Vijay Sharma, Prakash P. Kotwal, Atin Kumar

ABSTRACT

Acetabular labral ossification is an uncommon condition. We present a case of bilateral idiopathic acetabular labral ossification with no predisposing factor. The differential diagnosis of its plain radiographic appearance is discussed.

Key words: • acetabular labrum • os acetabuli • ossification

The acetabular labrum is a fibrocartilaginous rim attached to the acetabular margin. It deepens the acetabulum and increases the joint's stability. Its pathology is considered to be a potential cause of hip pain or clicking. Degeneration, tearing, and detachment of the labrum have been observed with arthrography, arthroscopy, and magnetic resonance imaging (MRI) (1). Nonetheless, labral ossification is extremely rare and we could find only a single case report of unilateral labral ossification in the literature (2). We present a patient with hip pain and an unusual radiological picture on plain films, computed tomography (CT), and MRI, suggestive of idiopathic bilateral acetabular labral ossification. The plain radiographic differential diagnosis is discussed.

Case report

A 45-year-old man presented to the orthopedic outpatient department with right hip pain that began 4 months earlier. On physical examination, there was painful limitation of extreme joint rotation. The antero-posterior radiograph of the pelvis (Fig. 1a) and oblique radiograph of the left hip joint (Fig. 1b) showed soft tissue ossification along the margins of the bilateral acetabula. The ossification followed the projected course of the acetabular labrum throughout. It was comprised of discrete, closely placed oval and round ossific foci, with a clearly discernible cortex and medulla. There was no acetabular incongruence or dysplasia. The joint space appeared to be preserved without subchondral sclerosis or cysts. A radiographic diagnosis of bilateral acetabular labral ossification was made.

Upon questioning, the patient denied any past history of trauma, hip surgery, osteomyelitis, tuberculosis, or drug intake. Metabolic parameters (serum calcium and phosphorus) were within normal limits. Skeletal survey did not reveal any evidence of hyperostosis or heterotopic ossification elsewhere. Hence, the ossification was labeled idiopathic.

CT was performed to confirm the location of the soft tissue ossification in relation to the bone (Fig. 2). It showed ossification closely related to the acetabular margin and more prominent along the supero-anterior and supero-posterior acetabular margins. Inferiorly, it was relatively deficient. Apart from minimal reduction in the superior joint space seen on the reformatted images, no other changes of osteoarthritis were seen.

MRI was performed to exclude any possible associated labral pathology (Fig. 3). It showed preservation of the triangular morphology of the bilateral acetabular labra. The labrum was prominently seen and exhibited a signal intensity similar that of bone on all sequences. There was no associated labral tear and no para-acetabular abnormality was seen separate from the ossified labrum. No osseous abnormality was observed and there was no joint effusion.

From the Departments of Radiology (J.K. ✉ docaiims@gmail.com, S.B., A.K.), and Orthopedics (V.S., P.P.K.) All India Institute of Medical Sciences, New Delhi, India.

Received 29 April 2006; revision requested 17 June 2006; revision received 18 June 2006; accepted 18 June 2006.

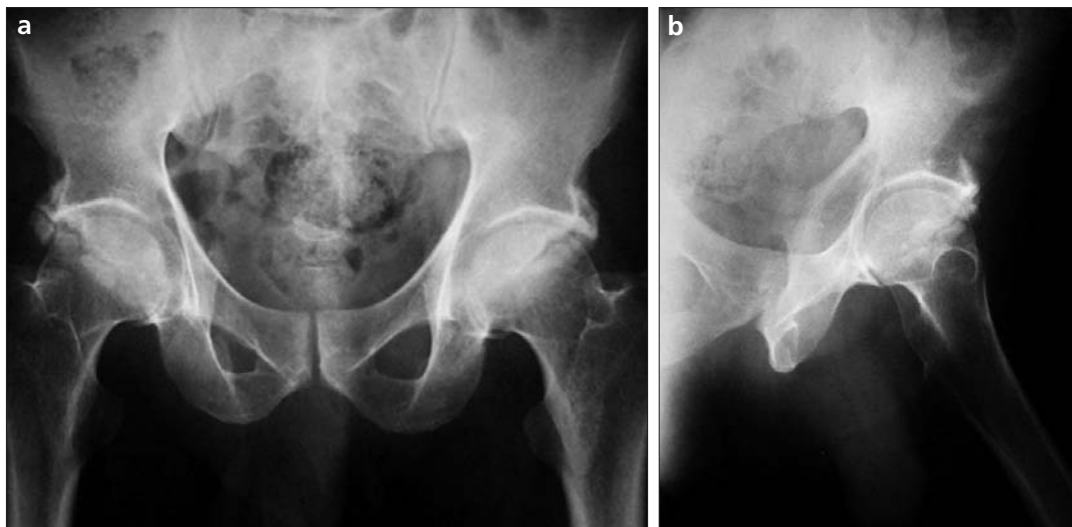


Figure 1. a, b. Anteroposterior radiograph of the pelvis (a) and oblique radiograph of the left hip (b) show discrete foci of ossifications along the margins of bilateral acetabula.



Figure 2. Reformatted coronal CT image shows ossification along the superior and inferior acetabular margins.

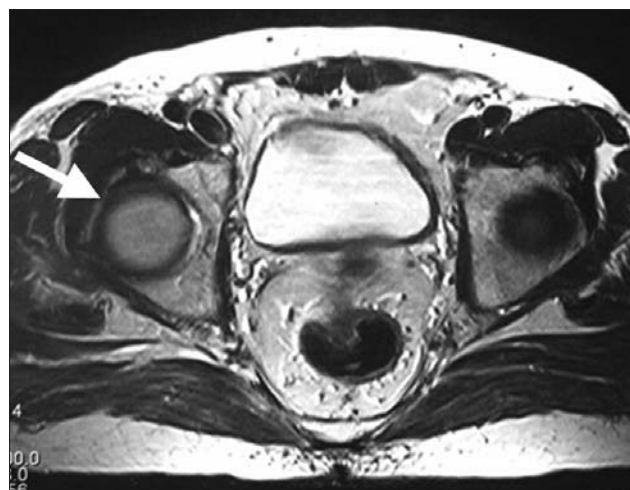


Figure 3. Axial T2-weighted MR image at the superior part of the hip joints shows normal triangular morphology of the acetabular labra with signal intensity of bone. The right superior labrum is seen in partial volume as a band of ossification bridging the acetabulum (arrow).

The patient was diagnosed with bilateral acetabular labral ossification on the basis of the imaging findings. The patient refused any surgical intervention and was managed conservatively.

Discussion

The acetabular labrum is a fibrocartilaginous rim attached to the acetabular margin. It deepens the acetabulum and increases the hip joint's stability. It has 3 surfaces: an intra-articular surface, an external surface contacting the joint capsule, and a basal surface attached to the acetabular bone. Its distal edge is free, forming the lateral limit of the acetabulum. Anteriorly, the labrum is equilaterally triangular in radial section. Posteriorly, it is more bulbous

and lip-like, and dimensionally square, but with a rounded distal surface. The labrum is widest in its anterior half and thickest in its superior half. Inferiorly, it merges with the inferior transverse acetabular ligament (1, 3).

Apart from arthroscopy, radiological methods such as conventional or CT arthrography have been used to investigate labral lesions. In recent years however, MRI and MR arthrography have increasingly been used to evaluate the acetabular labrum. Currently MRI is the modality of choice for non-invasively visualizing this structure (4).

Lesions of the acetabular labrum clinically present as hip pain and include labral tears or detachment. Labral ossification is very rare.

Para-acetabular ossification on plain radiographs has a long list of differential diagnoses. Bony fragments are sometimes seen about the acetabular rim, which may simulate labral ossification. Anatomists have regarded these as remnants of secondary centers of ossification and a normal part of development of the acetabulum, proposing the name "os acetabuli"; however, these are unlikely to be seen after the age of 20 years. Others have observed these fragments secondary to trauma, rickets, osteomyelitis, tuberculosis, and osteochondritis dissecans. These fragments have also been ascribed to overloading of the acetabular rim in a dysplastic hip with incomplete femoral head coverage, causing fracture and

separation of a segment of the rim, especially in type II acetabular dysplasia known as acetabular rim syndrome. This condition is associated with distorted labral morphology, including tears, which have been demonstrated on MRI (5). Heterotopic bone formation around the hip has also been seen on radiographs of patients after total hip replacement. In some studies diffuse idiopathic skeletal hyperostosis (DISH) was proven to be a significant risk factor in such cases. The heterotopic bone is seen to extend from the trochanter to acetabulum in an intertrough or continuous manner, which differs from the imaging appearance of acetabular labral ossification (6). Etretinate-induced heterotopic bone formation has also been reported around the hip (7). There are case reports of heterotopic ossification around the hip associated with osteoid osteoma (8) and sickle cell disease (9). Periarthritis calcarea is another syndrome characterized by acute periarticular inflammation and is radiologically associated with transient juxta-articular calcific deposits. These calcifications are often located at the attachments of the joint capsules or tendon insertions. Periarthritis calcarea is recognized as a type of crystal deposition disorder (10).

In the presented case, there was no acetabular dysplasia or incongruent shallow acetabulum. Additionally, the other predisposing factors mentioned above were absent. There were no radiological manifestations of DISH in the

spine. Furthermore, the pattern and orientation of the ossific foci in the presented case completely paralleled the acetabular rim along the projected labral contour and was characteristic of true labral ossification. This was confirmed by CT, which showed the close proximity of the ossification to the acetabular margin better than MRI did. The ossification was more prominently seen at the superior aspect of the acetabulum than inferiorly. This parallels the normal labrum, which is widest anterosuperiorly and posterosuperiorly and somewhat deficient inferiorly (1, 3). MRI was performed to directly visualize the acetabular labrum and to exclude associated hip or labral pathology. It clearly showed the ossification within the acetabular labrum. To the best of our knowledge, there is only one published case report of idiopathic unilateral labral ossification (2). We have demonstrated the appearance with noninvasive imaging modalities, namely plain radiographs, CT, and MRI. It is important to be aware of this entity, which can be a predisposing factor for premature secondary osteoarthritis. The diagnosis can be based on the plain radiographic appearance; however, other conditions, which may simulate this appearance, must be excluded, as some may have different management approaches, such as surgery for reorientation of the acetabulum in acetabular dysplasia or drug withdrawal in cases of etretinate-induced ossification.

References

1. Cotten A, Boutry N, Demondien X, et al. Acetabular labrum: MRI in asymptomatic volunteers. *J Comput Assist Tomogr* 1998; 22:1-7.
2. Ninomiya S, Shimabukuru A, Tanabe T, Kim YT, Tachibana Y. Ossification of the acetabular labrum. *J Orthop Sci* 2000; 5:511-514.
3. Binningsley D. Tear of the acetabular labrum in an elite athlete. *Br J Sports Medicine* 2003; 37: 84-88.
4. Aydingoz U, Ozturk MH. MR imaging of the acetabular labrum: a comparative study of both hips in 180 asymptomatic volunteers. *Eur Radiol* 2001; 11:567-574.
5. Klaue K, Durnin CW, Ganz R. The acetabular rim syndrome. *J Bone Joint Surg Br* 1991; 73:423-429.
6. Bundrick TJ, Cook DE, Resnik CS. Heterotopic bone formation in patients with DISH following total hip replacement. *Radiology* 1985; 155:595-597.
7. Inoue K, Imai S, Iwasaki A, Egawa M, Hukuda S. Etretinate-induced heterotopic bone formation about the hip joint. *Clin Orthop* 1994; 308:139-145.
8. Takaoka K, Yoshikawa H, Masuhara K, Sugano N, Ono K. Ectopic ossification associated with osteoid osteoma in the acetabulum. A case report. *Clin Orthop* 1994; 299:209-211.
9. Fye MA, Baumgaertner MR. Multifocal heterotopic ossification in a patient with sickle cell disease: a case report. *Am J Orthop* 1997; 26:216-219.
10. Kawashima A, Murayama S, Ohuchida T, Russell WJ. Para-acetabular periarthritis calcarea: its radiographic manifestations. *Skeletal Radiol* 1988; 17:476-482.