

Ossification of the ligamentum teres as a possible mechanism of lateral subluxation in coxopathy associated with ankylosing spinal hyperostosis

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Abstract

The cases are reported of two patients with coxopathy associated with ankylosing spinal hyperostosis who showed ossification of the ligamentum teres. It is suggested that considerable ossification at the medial acetabular floor including the ligamentum teres can explain the mechanism of development of coxopathy with lateral subluxation of the femoral head which is often seen in patients with ankylosing spinal hyperostosis.

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Ankylosing spinal hyperostosis often accompanies the extraspinal manifestation called diffuse idiopathic skeletal hyperostosis,¹ and enthesial bone formation at the hip joint (hyperostotic hip) is common in patients with ankylosing spinal hyperostosis. Although some patients with a hyperostotic hip develop joint damage, little is known about the mechanism of destruction. We report here two cases of patients with a hyperostotic hip with lateral displacement of the femoral head and ossification of the ligamentum teres, and suggest a mechanism for the pathogenesis of joint damage in hyperostotic hips.

Case reports

PATIENT 1

A 69 year old man presented with laminoplasty of the cervical spine in February 1988 because of myelopathy due to ossification of the posterior longitudinal ligaments. His right hip ached from November 1988 and he was admitted to the Shichikawa Arthritis Research Center because of disturbance to his gait. There were hyperostotic spurs in the dorsal spine predominantly on the right side with bony bridging. Anteroposterior radiography of the pelvis showed a bony growth on the right acetabular rim and considerable loss of articular cartilage. Close observation showed thickening of the medial acetabular floor and lateral displacement of the femoral head (fig 1). Disappearance of the soft tissue at the medial acetabular floor was confirmed when total hip arthroplasty was performed in 1989. When tissue of the ligamentum teres, contiguous to newly formed bone in the fossa acetabuli was studied histologically, woven bone was found in the cartilaginous tissue (fig 2).

PATIENT 2

A 64 year old woman attended the outpatient clinic of the Shiga University of Medical Science Hospital because of an ache in her left hip. Anteroposterior radiographs of the pelvis showed no abnormality except for the subtle finding of ossification at the acetabular rim (fig 3). She attended the hospital nine years later as a result of limping. The radiograph taken at that time showed narrowing of the joint space in her left hip. A bony prominence was observed at the medial side of the femoral head where the ligamentum teres enters the head. The radiolucent area of the fossa acetabuli could not be seen; instead, there was a hypertrophic medial acetabular floor and lateral displacement of the femoral head (fig 3). Radiographs of the dorsal spine revealed considerable bony bridges predominantly on the right side. The tissue of the ligamentum teres insertion into the medial acetabular floor was histologically examined at total hip arthroplasty performed in 1989. The specimen showed lamellar bone within soft tissue.

Discussion

Although hyperostotic hips often develop joint damage, there has been only one report of the

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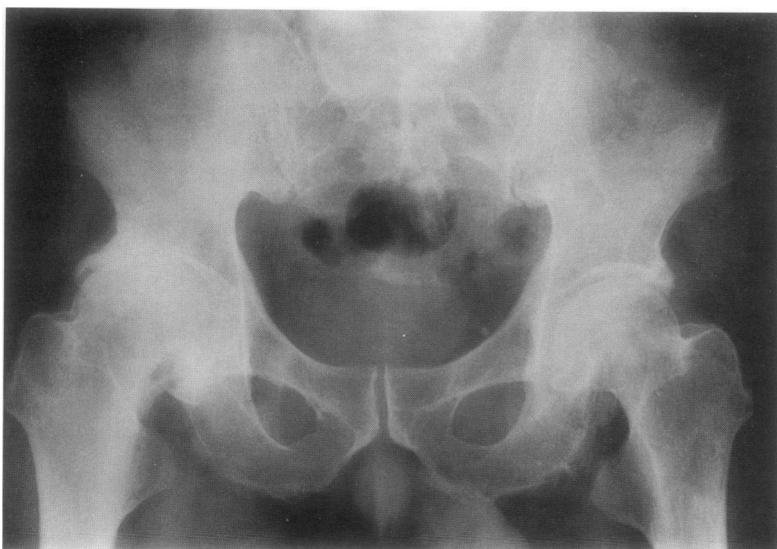


Figure 1 Case 1. Hyperostotic medial acetabular floor and lateral displacement of the femoral head.

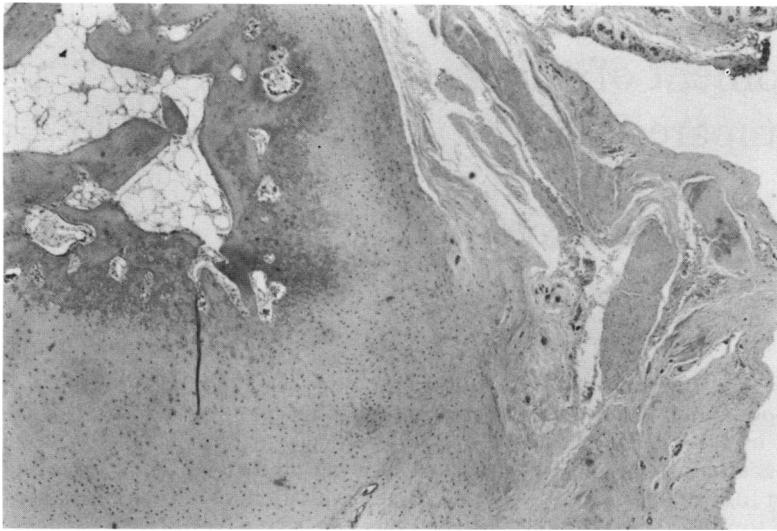


Figure 2 Case 1. Histological specimen of ligamentum teres showing bone formation in cartilaginous tissue (haematoxylin and eosin stain).

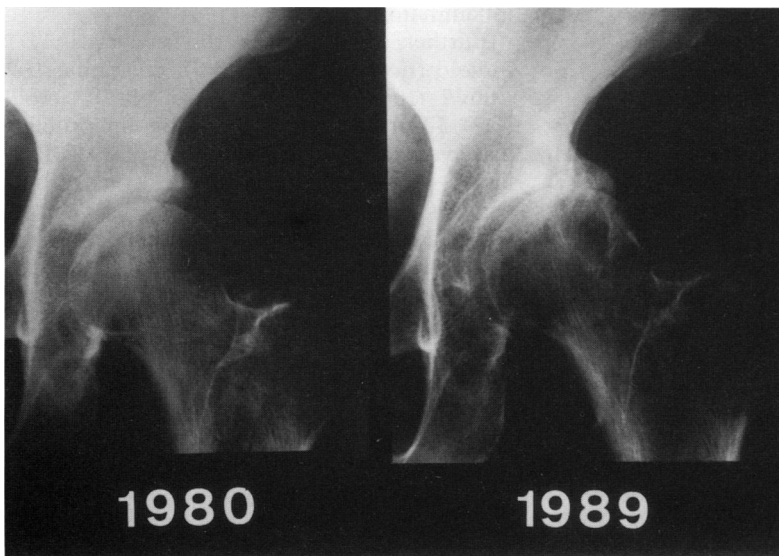


Figure 3 Case 2. Propagation of a hyperostotic hip. Thickening of the medial acetabular floor and slight lateral displacement of the femoral head were seen in a later radiograph.

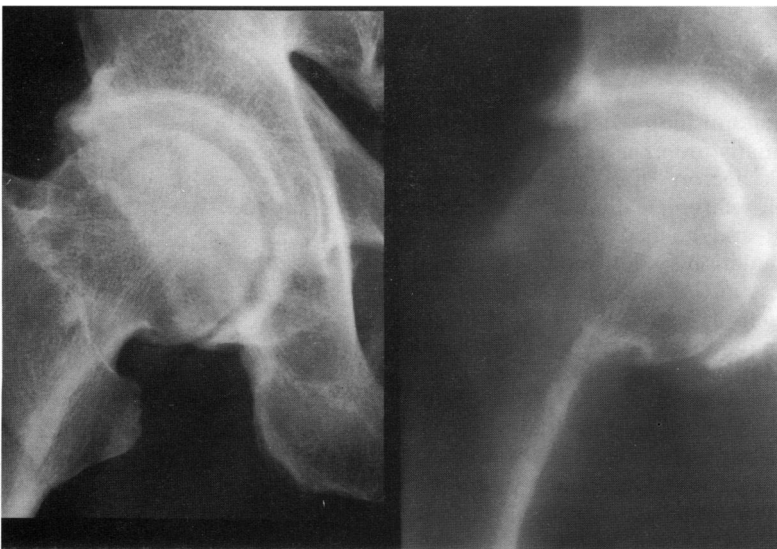


Figure 4 Ossification of the ligamentum teres without articular cartilage loss seen in patients with ankylosing spinal hyperostosis. A simple radiograph (left) and a tomograph (right).

mechanism of joint destruction, and this suggested ischaemia as a cause.² As reported by Arlet *et al*,³ there are two types of joint damage in the hyperostotic hip: one with superolateral narrowing of the joint space and the other with medial protrusion of the femoral head.

If ossification at the acetabular rim is considerable, the encased hip might be impaired, possibly by ischaemia.² In such a situation increased stress at the medial floor due to overgrowth of the acetabular rim causes medial protrusion of the femoral head. The superolateral type joint damage cannot be explained by ischaemia, however.

Ossification at the acetabular rim has often been noted in anatomical descriptions of the hyperostotic hip. Harris *et al* observed fluffy new bone formation, typically on the margins of the iliac bones from the anterior iliac spines to just above the acetabulae, inferiorly in relation to the pubic rami and to the femoral greater trochanters.⁴ Our observation, however, suggests that new bone formation may occur not only at the acetabular rim, but also at the fossa acetabuli including the ligamentum teres. We observed ossification of the ligamentum teres in several patients with ankylosing spinal hyperostosis who did not show any signs of joint damage (fig 4). A similar finding appeared in a radiograph of hyperostotic hips associated with etretinate.⁵ Thus new bone formation at the acetabular floor does not seem to represent osteophyte formation secondary to joint damage. Histological data confirmed soft tissue ossification at the insertion of the ligamentum teres. Ossification at the medial acetabular floor will be followed by lateral displacement of the femoral head, resulting in superolateral narrowing of the joint space.

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