Other full case

Arthroscopic identification of iliopubic and ilioischial grooves in a single adult acetabulum

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Summary

We report the arthroscopic identification of combined morphological variants of the acetabulum in an adult. The combination of iliopubic and ilioischial grooves has not been reported before. Preoperative radiographic and MRI failed to detect the lesions. These grooves strongly suggest incomplete fusion between the three limbs of the triradiate cartilage. When identified, this condition should not be treated as pathological but as a rare anatomical variant. Hip arthroscopy is a competent tool in discovering such asymptomatic cartilage abnormalities and subtle anatomical variations even in the presence of normal preoperative imaging.

BACKGROUND

The anatomy, embryology and development of the acetabulum have been presented extensively in the literature.^{1–3} Morphological variations have been described in the context of hip dysplasia and Perthes' disease. Attempts have been made to correlate these variations with the possible development of osteoarthritis.^{1 2 4–11} However, the advent of hip arthroscopy has allowed further, detailed inspection of the hip joint. Our understanding of the arthroscopic anatomy of the hip^{3 12} has recently been supplemented by reports of further morphological variations.^{13 14}

This is the only report known to the authors of combined iliopubic and ilioischial grooves of the acetabulum. It is clearly important to recognise such rare anatomical variants so they are not incorrectly diagnosed as pathological entities and treated inappropriately. To recognise the abnormal, a surgeon must first recognise the normal. The diagnostic efficacy of hip arthroscopy enables identification of such subtle anatomical variations, where conventional radiography and MRI arthrography fail to do so.

CASE PRESENTATION

A 36-year-old female professional dancer presented with a 12-month history of progressive pain in her left groin with no associated initiating event. She described activity-related discomfort and occasional episodes of instability. She had no past medical history of note.

Clinical examination revealed good posture, equal leg lengths and normal neurovascular status. However, a clear finding was a positive impingement sign.¹⁵ The patient also showed minor weakness of her left iliopsoas and pain at the extremes of rotation. Rotation was slightly restricted on the affected side.

INVESTIGATIONS

MRI showed early degenerative changes in both hips and a possible degenerative labral tear on the affected side. No other pathology or anatomical variant was identified.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis included femoroacetabular impingement and/or a labral tear. Other occult pathology, such as injury to the ligamentum teres, the articular cartilage or iliopsoas tendinitis had to be excluded.

TREATMENT

The patient underwent a left-hip arthroscopy. The findings in the central compartment of the joint included an anterior labral tear and a partial tear of the ligamentum teres. The transverse ligament, synovium, femoral articular surface and cotyloid fossa were normal. However, although the acetabular articular cartilage appeared to be of normal quality, it exhibited both iliopubic and ilioischial grooves. The iliopubic groove (figure 1) clearly originated from a well-defined stellate crease,³ also known as the 'acetabular point', as described by Rissech *et al.*¹⁶ In addition, posteriorly there was a large ilioischial groove (figure 2) which corresponded to the 'ilioischial notch' previously described on semi-fused immature pelvic bones.¹⁶

In the peripheral compartment, the presence of an impingement lesion confirmed the mechanism of injury of the labrum. This was treated by excision of the impingement lesion and arthroscopic partial acetabular labrectomy. The patient also underwent shrinkage of a partially ruptured ligamentum teres.

Postoperatively she mobilised well, was discharged as a day case and received physiotherapy until her 6-week review.

DISCUSSION

The junction between the ilium, ischium and pubis in the human acetabulum, known as the acetabular point,¹⁷ has been shown to be consistently represented by the indentation between the superior and the anterior lobe of the cloverleaf-shaped acetabular fossa in adults.¹⁶ The fact that the anterior groove identified in this patient originated from the same area reinforces our belief, reported previously, that it represents the remnant of incomplete iliopubic fusion of the triradiate cartilage.¹³

Figure 1 Iliopubic groove.

Figure 2 Ilioischial groove.

Arthroscopy also clearly identified an ilioischial groove, corresponding to the indentation between the superior and the posterior lobes of the acetabular fossa. The only other report of incomplete posterior fusion known to the authors, which describes the complete separation of the outer and inner parts of a bipartite acetabulum with a subluxed femoral head, also associated it with severe hip dysplasia.¹⁸

Despite extensive literature being available on premature acetabular fusion,^{19–25} our report is one of only three existing reports of incomplete acetabular fusion, and the only report of a patient with both iliopubic and ilioischial grooves.

The functional integrity of this irregularly shaped acetabulum had been interrupted on this occasion by femoroacetabular impingement, a labral tear and a partial ligamentum teres tear.

Regardless of the significance of this rare anatomical variant, special attention needs to be paid when interpreting such a finding during MRI or hip arthroscopy. It is difficult, but important, to distinguish the finding from an intra-articular lesion, as this could result in overtreatment. Given the limitations of conventional radiography and MRI with or without arthrography^{26–28}, this case highlights the diagnostic efficacy of hip arthroscopy in revealing the otherwise undetectable lesions at an early stage.^{13 14}

Learning points

- ▶ If identified, this condition should not be treated as pathological but as a rare variant.
- ▶ This variant suggests some independence between the component parts of the epiphysis during acetabular development.
- ▶ The diagnostic efficacy of hip arthroscopy enables identification of such subtle anatomical variants, whereas conventional radiography and MRI arthrography frequently do not.

Competing interests None.

Patient consent Obtained.

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