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Voluntary hip subluxation examined by computed tomography

In a 17-year-old girl, voluntary posterior subluxation of the hip was demonstrated by fluoroscopy, cineradiography, and computed tomography.

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Habitual voluntary dislocation of the hip in otherwise normal children with no history of hip trauma or other signs of hip pathology has been reported by Hilgenreiner (1932), Heikkinen & Sulamaa (1971), Petterson et al. (1980) and Goldberg et al. (1984). We have treated an adolescent girl with habitual posterior subluxation of the right hip joint, and the aim of our report is to present a possible pathomechanical explanation.

Case report

An otherwise normal 17-year-old girl, with no history of previous hip trauma, had since childhood been able to elicit a loud click when she flexed, adducted, and slightly rotated her right hip internally, and then extended it. She felt instability of the hip and sometimes pain, and therefore sought medical attention. There was no family history of joint laxity, and the joints of our patient had normal excursions.

On examination we found that the iliotibial tract was gliding smoothly over her right trochanter major, and thus a regular snapping hip could be excluded. Plain radiographs showed symmetrical, normal development of the hip joints. The anteversion of the femoral neck was normal, 16° on the right and 20° on the left side using the method of Dunlap-Rippstein (Rippstein 1955). Fluoroscopy demonstrated that the right femoral head did subluxate posteriorly during the voluntary click maneuver, after which the femoral head resumed its normal position with a concomitant click. When the provocational procedure was filmed, we saw a gas or vacuum phenomenon (Petterson et al. 1980) in the joint cavity when the femoral head was in the dislocated position.

Contiguous 5-mm-thick axial CT-images of the hips with the patient supine and the hips in relaxed rotation, using a GE 9800 high-resolution CT-scanner with a 512 matrix, showed the inferior part of the posterior acetabular margin to be poorly developed bilaterally, but more so on the right side (Figure 1). The acetabular anteversion was 10° on the right and 14° on the left side. It was suspected that the subluxation was caused by a tight iliopsoas tendon. However, there was no postoperative improvement in the joint stability after an iliopsoas tenotomy, and for this reason another CT-examination was performed. The patient was supine with the right hip in the provocational position with 70° flexion, slight adduction, and minimal internal rotation, and with the knee in 100° flexion. The CT showed that the femoral head jumped back and forth be-

Figure 1. Axial CT-image 5 mm below the femoral head centres. Note poorly developed posterior acetabular margin bilaterally.

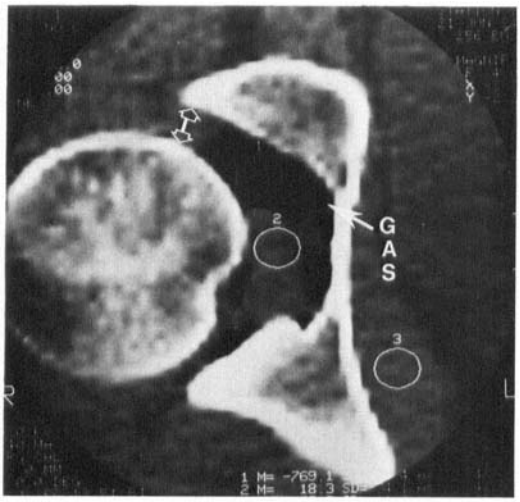

Figure 2. Central CT-image showing subluxation and a vacuum phenomenon. Note the increased anterior joint space.

tween the subluxated and normal position. In subluxation the distance between the femoral head and the acetabulum was greatest in the anterior part of the joint, and gas was found in the joint cavity (Figure 2), proven by a measurement of −769 Hounsfield units. The posterior acetabular sector angle (Anda et al. 1985) was 90° bilaterally. This was lower than any of the measured values in our material of 40 normal adult female hips and demonstrated that the posterior acetabular rim was poorly developed and probably acted as a fulcrum for the subluxation of the femoral head.

Based on these findings a posterior shelf operation was performed, and 6 months after surgery the hip was stable and painless. It is still too early for the final evaluation.

Discussion

As far as we know, our case is the first report of an adolescent with voluntary subluxation of the hip. Other reported children with voluntary posterior dislocation have all developed normal hips, with or without treatment. Although we have no observations of our patient from childhood, it seems reasonable to assume that she had the same type of voluntary posterior dislocation as reported by others. However, there are some differences. In previous cases it has been reported that a loud click was heard when the femoral head dislocated out of the acetabular socket, while only a dull sound was heard when reposition took place. In our patient, however, a loud click was heard upon reposition. Furthermore, from the published radiographs, it seems that the degree of dislocation was much greater than in our patient.

The diagnosis of posterior habitual dislocation of the hip is difficult. These patients may easily be misjudged as having a snapping iliotibial tract or another snapping condition of the hip. The diagnosis should be made by fluoroscopy, preferably linked to a videotape recorder. Cineroentgenography is an alternative, whereas CT-examinations give good information on the development of the posterior acetabular margin.

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