Femoral head osteochondritis dissecans in a child

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SUMMARY
This case report describes an early-adolescent boy with an osteochondritis dissecans (OCD) lesion of the left femoral head secondary to significant acetabular dysplasia and coxa valga of the proximal femur. Patient underwent left proximal femur varus osteotomy. Follow-up imaging demonstrates healing and resolution of the OCD lesion. Future plan for left hip is periacetabular osteotomy, following triradiate cartilage closure, to correct acetabular dysplasia. The aim of this case report is to support clinicians in the assessment and treatment of this rare condition.

BACKGROUND
Osteochondritis dissecans (OCD) is a rare focal defect of the subchondral bone that commonly affects adolescent populations and increases the risk of premature osteoarthritis due to dysfunction in articular cartilage.1 This condition can affect multiple joints, but OCD of the femoral head is an uncommon site consisting of 2% of all OCD cases.2 The aetiology of this condition is not well understood or agreed on; however, research suggests trauma, inflammation, Legg-Calvé-Perthes disease (a form of idiopathic avascular necrosis) and genetics may play a role in its development.3–5 Notable to this case report is a considerable amount of research that specifically points to repetitive microtrauma as a potential causative agent of OCD.6 7 Coxa valga is a condition where the femoral angle is greater than 139 degrees and is commonly associated with hip dysplasia.8 9 This case demonstrates an early-adolescent boy presenting with a left femoral head OCD lesion a week after ‘hearing popping in the left hip’ while walking upstairs. To our knowledge, there are no reported cases of femoral head OCD with acetabular dysplasia and proximal femur coxa valga in the paediatric population.

CASE PRESENTATION
This patient is an otherwise healthy early-adolescent boy who presented to the emergency department (ED) 4 days after hearing ‘multiple small pops’ in his left hip while walking upstairs. The patient had mild pain at the time of the incident, which increased over the next couple of days to the point where he could no longer ambulate. The patient was discharged home and referred to our clinic for further evaluation and management. On initial consultation at our clinic 3 days later, the patient reported that his pain had improved, and he was able to bear some weight on the left leg. However, he stated he experienced groin pain after standing for long durations of time. He described an ongoing history of mild aching hip pain with no diagnosis prior to this incident.

INVESTIGATIONS
Physical examination in the ED demonstrated tenderness to palpation of the left inguinal crease and along the abductor musculature. Patient was unable to bend left knee past 30 degrees without hip pain but was neurovascularly intact distally. Absence of fever and inflammatory signs lowered infection on differential and the ED proceeded with imaging. At the time of referral to the orthopaedic surgery clinic, radiographs and CT were completed at initial presentation at the ED and revealed findings of acetabular dysplasia, bilateral coxa valga and concern for left femoral head OCD lesion (figure 1).

On physical examination of the left hip, the patient had pain when flexed greater than 90 degrees. His pain was mild at initial presentation at the ED and revealed findings of acetabular dysplasia, bilateral coxa valga and concern for left femoral head OCD lesion (figure 1). On physical examination of the left hip, the patient had pain when flexed greater than 90 degrees. His hip was non-tender to palpation, and he reported no pain with left hip internal rotation, external rotation, adduction or abduction. Following the clinic visit, MRI confirmed a diagnosis of a stable left femoral head OCD with acetabular dysplasia and proximal coxa valga (figure 2).

Figure 1  (A) CT and (B) X-ray image demonstrating significant hip dysplasia, bilateral coxa valga and left femoral head osteochondritis dissecans lesion (red arrow). Approximately 50% uncovering of the femoral head was noted.
TREATMENT
The patient was placed on conservative treatment of Tylenol and non-ambulation, but pain and limp were still present and interfering with daily activities 3 weeks after the initial ED presentation. Undercoverage of the femoral head has led to edge loading which has likely contributed to the femoral head lesion and worsening hip pain. Due to the concern for the patient’s femoral head OCD lesion in the setting of significant acetabular dysplasia and concurrent coxa valga, it would be unlikely that conservative treatment would lead to significant healing of the OCD lesion. The rationale for surgical intervention was to treat the patient’s current symptoms, but also to protect femoral head cartilage and OCD lesion from progressing to an unstable lesion and early hip osteoarthritis. After a thorough discussion of the treatment options, the patient was treated surgically with left proximal femur varus osteotomy with internal fixation in an effort to offload the focal OCD of the femoral head. Surgery was performed using a lateral-based incision and subvastus approach to the proximal femur. Approximately 30 degrees of correction of the patient’s neck shaft angle proximally was chosen to offload his femoral head OCD without significantly altering his femoral anatomy. A medial closing wedge osteotomy was performed at the intertrochanteric region and secured with a cannulated 90 degree blade plate and screws. Desired correction and implant placement were confirmed with fluoroscopy (figure 3). The wound was irrigated and closed in a layered fashion. Postoperatively, the patient was instructed to remain on crutches and avoid weight-bearing for 6 weeks.

OUTCOME AND FOLLOW-UP
At 3 months postoperation, radiographic imaging revealed healing of the osteotomy, as well as the femoral head OCD lesion (figure 4). The patient had progressed to full weight-bearing without any assistive devices and reported complete resolution of his hip pain. The plan is for this patient to undergo removal of hardware and periacetabular osteotomy (PAO) to address his acetabular dysplasia once the closure of his triradiate cartilage has occurred.
DISCUSSION
A number of articles report on OCD in paediatric patients; however to the best of our knowledge, there are no reported cases of femoral head OCD with acetabular dysplasia and coxa valga in a paediatric patient. Steenbrugge and Macnicol reported three cases of OCD in a 6-year-old girl, 18-year-old boy and 15-year-old boy predisposed to Legg-Calvé-Perthes disease. Woods et al reported seven cases of OCD primarily in paediatric patients predisposed to Legg-Calvé-Perthes disease, three with avascular necrosis following trauma, one with avascular necrosis following tuberculosis infection and six idiopathic cases. Siebenrock et al reported a case of OCD in a 16-year-old with coxa valga. Lee et al reported 13 cases of OCD following Legg-Calvé-Perthes disease in children from ages 7–11 years.

This report presents a rare case involving a femoral head OCD lesion in an early-adolescent boy with underlying acetabular dysplasia and coxa valga. Radiography (X-ray, CT and MRI) aided in the characterisation and diagnosis of OCD, hip dysplasia and coxa valga. We believe this patient’s existing hip dysplasia and subluxation were the direct cause of his OCD lesion and symptoms. The mechanism of injury likely resulted from continuous edge loading and shearing forces between the femoral head and acetabulum, secondary to his dysplasia and coxa valga. Addressing the initial subluxation with the varus osteotomy and internal fixation was necessary to allow the OCD defect to heal and help prevent the premature onset of osteoarthritis. Three months postoperation, the patient demonstrated a positive outcome with radiographic healing of his osteotomy and internal fixation was necessary to allow the OCD defect to heal and help prevent the premature onset of osteoarthritis. The case report was written by SGH and RGM. The case report was revised by SGH, RGM and JBE.

Contributors The case report was supervised by JBE. Patient was under the care of JBE. The case report was written by SGH and RGM. The case report was revised by SGH, RGM and JBE.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Parental/guardian consent obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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REFERENCES