Lesson of the Week

Slipped capital femoral epiphysis: continuing problem of late diagnosis

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Introduction

Slipped capital femoral epiphysis is comparatively common in adolescence, yet diagnosis is still often delayed.¹ We report four such cases, which were seen over three months.

Case reports

Case 1—A 14 year old boy attended his general practitioner with pain in the right hip and knee. The pain failed to resolve over the next three months and pelvic radiography was requested. This was reported on as showing nothing abnormal. A routine referral was then made to an orthopaedic surgeon. When seen two months later an external rotational deformity and limited internal rotation were found. Radiography showed a severe slip. Complex open reduction was required to correct the deformity. During follow up a minor slip occurred in the opposite hip and was treated by simple pinning in situ to prevent further displacement.

FIG 1—Typical external rotational deformity in slipped capital femoral epiphysis (case 3).

Any adolescent with a limp or pain in the hip or knee must be regarded as having a slipped capital femoral epiphysis until definitely excluded radiologically; there is no such thing as a sprained hip, "growing pains," or rheumatism in these patients

FIG 2—Classical radiological appearance of slipped capital femoral epiphysis (case 3).

Case 2—A 14 year old boy with a history of obesity and hypogonadism presented to his general practitioner complaining of pain in his left knee. There was no history of trauma. He was treated for seven months as a soft tissue injury. After the onset of pain in the left groin a radiograph of the pelvis showed severe displacement of the proximal femoral epiphysis. A further three weeks elapsed before he could be seen by an orthopaedic surgeon.

Case 3—An 11 year old girl complained of pain in her right hip after falling on the ice. Her father, a doctor, failed to recognise the implication of the injury. It was three days before she was seen at the casualty department. Examination showed a shortened, externally rotated right leg (fig 1). All hip movements were painful and limited. Radiography showed a slipped epiphysis (fig 2), which was pinned in situ.

Case 4—A 15 year old boy complained of pain after injuring his hip at football. The pain was thought to be due to a soft tissue injury. Two months later the hip was no better and radiography showed a minimally displaced slipped epiphysis. There was a three week delay before he was seen by an orthopaedic surgeon. The hip was pinned in situ.

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Comment

Slipped capital femoral epiphysis is a gradual (chronic) or, in a third of cases, sudden (acute or chronic) displacement of the femoral head in relation to the femoral neck and shaft.² The displacement occurs through the growth plate, which is thought to be weakened in susceptible adolescents. The typical age is 10-16 years, over one fifth of cases are bilateral, and more boys are affected than girls.^{1,3} The exact aetiology is unknown but one third of patients are obese and have hypogonadism.

Usually there is no relevant history of injury. The patient develops a limp or pain in the groin, anterior thigh, or knee. The striking physical finding is limitation of hip movements, particularly internal rotation.^{3,4} Even if the clinical findings are normal anteroposterior and lateral radiographs must be obtained.

The treatment of slipped capital femoral epiphysis is surgical.^{3,4} Minor displacements are prevented from becoming worse by inserting several pins.^{4,8} Severe displacement, and the consequent deformity, may require complicated reconstructive surgery.^{5,6,9-12}

Apart from the immediate discomfort, the main importance of slipped capital femoral epiphysis is in the potential complications.⁵ Avascular necrosis of the femoral head (13%),⁵ chondrolysis of the articular cartilage of the hip, and malunion may all cause early osteoarthritis^{6,9} leading to severe disability in young adults.

The frequency of complications increases with delay, with displacement, and with complex surgery.^{5,8,10} Early diagnosis is therefore crucial, allowing early, simple surgery to minimise the deformity and the risk of late disability.

References

- 1 Burrows HJ. Slipped upper femoral epiphysis. Characteristics of a hundred cases. *J Bone Joint Surg* 1957;39B:641-58.
- 2 Sharrard WJW. *Paediatric orthopaedics and fractures*. Oxford: Blackwell Scientific, 1979:396.
- 3 Williams PF, ed. In: *Orthopaedic management in childhood*. Oxford: Blackwell Scientific, 1982:257.
- 4 Griffiths MJ. Slipping of the capital femoral epiphysis. *Ann R Coll Surg Engl* 1976;58:34-42.
- 5 Canale ST. Miscellaneous affections of bone and joints. In: Edmontson AS, Crenshaw AH, eds. *Campbell's operative orthopaedics*. St Louis: C V Mosby, 1980:1242.
- 6 Boyer DW, Mickelson MR, Ponseti IV. Slipped capital femoral epiphysis. *J Bone Joint Surg* 1981;63A:85-95.
- 7 Greenough CG, Bromage JD, Jackson AM. Pinning of the slipped upper femoral epiphysis—a trouble-free procedure? *J Pediatr Orthop* 1985;5:657-60.
- 8 O'Brien ET, Fahey JJ. Remodelling of the femoral neck after in situ pinning for slipped capital femoral epiphysis. *J Bone Joint Surg* 1977;59A:62-8.
- 9 Dunn DM, Angel JC. Replacement of the femoral head by open operation in severe adolescent slipping of the upper femoral epiphysis. *J Bone Joint Surg* 1978;60B:394-403.
- 10 Fish JB. Cuneiform osteotomy of the femoral neck in the treatment of slipped capital femoral epiphysis. *J Bone Joint Surg* 1984;66A:1153-68.
- 11 Salvati EA, Robinson HJ, O'Dowd TJ. Southwick osteotomy for severe chronic slipped capital femoral epiphysis: results and complications. *J Bone Joint Surg* 1980;62A:561-70.
- 12 Southwick WO. Slipped capital femoral epiphysis. *J Bone Joint Surg* 1984;66A:1151-2.

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Contemporary Themes

Recommendations on the use of living kidney donors in the United Kingdom

BRITISH TRANSPLANTATION SOCIETY

Cadaveric donor transplantation remains the preferred form of treatment for end stage renal disease, and the British Transplantation Society will continue to encourage an increase in the availability of cadaveric organs. The society believes that the only justification for the use of living donors in renal transplantation is the continuing shortage of cadaveric donors.

When living donors have been used by transplant units in the United Kingdom it has been traditional to accept only blood relatives as they offer a very good chance of success. In other countries where there is a severe shortage of cadaveric donors and resources living unrelated donors have been used. With improved results of kidney transplantation from unrelated cadavers, doctors are being asked to consider a broader choice of donor. The society believes that such donors should be used only exceptionally, when a cadaver or living related donor cannot be found. We consider that it would be wrong to exclude totally living unrelated donors in the United Kingdom, but their use will require extremely rigorous safeguards to avoid the exploitation of donors and the manipulation of recipients and to afford adequate protection for doctors. Safeguards are also required to minimise the chance of a surgeon

using a donor organ from a living non-relative when he has been led to believe that the donor and recipient were blood relatives.

The society, therefore, has adopted the following guidelines. Before accepting a living donor the transplant surgeon must be satisfied that all of the following conditions have been fulfilled.

Related donors

(1) Blood relatives willing to donate organs must provide evidence of their relationship with the recipient. A family group often provides witnesses to the consanguinity of donor and recipient, and the facts must be checked by the surgeon with the family practitioner. A surgeon must not proceed to transplant a kidney from an alleged living related donor until he is convinced that the evidence is overwhelmingly in favour of the fact of consanguinity. When doubt exists about the truth of verbal evidence or (in the case of a foreign donor) written evidence about consanguinity the surgeon should insist on additional evidence being obtained to confirm or refute consanguinity. Studies on the patient and relevant family members should be performed using some or all of the following techniques: HLA A, B, and DR typing; erythrocyte antigen subtyping; globulin allotyping; and deoxyribonucleic acid (DNA) "fingerprinting."

Tests with DNA hybridisation can establish with a high degree of certainty a first degree relationship. When the patient and the proposed donor claim a more distant relationship the availability of blood from a common first degree relative would be valuable. When the surgeon's final opinion is that the evidence indicates an unacceptably high risk of non-consanguinity he should refuse to perform the operation.

The normal practices which have applied to organ donation from living relatives in the United Kingdom should be applied in all instances.

This report was compiled on behalf of the British Transplantation Society by Robert A Sells, R W G Johnson, and I Hutchinson.

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