TRAUMATIC DISLOCATION OF THE HIP IN ADOLESCENCE WITH SEPARATION OF THE CAPITAL EPIPHYSIS

TWO CASE REPORTS

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Fracture separation of the capital femoral epiphysis occurring during attempted closed reduction of a traumatic dislocation of the hip is described in two adolescents. Although this complication is extremely rare, the prognosis of fracture separation with dislocation of the epiphysis is known to be poor. Avascular necrosis subsequently developed in both cases. The importance of gentle manipulative reduction under general anaesthesia with complete muscle relaxation is emphasised.

Traumatic dislocation of the hip is an uncommon injury in childhood and adolescence. Traumatic fracture separation of the capital femoral epiphysis, with or without dislocation of the epiphysis, is rarer still. Rang (1974) states that during reduction of a traumatic dislocation a previously unrecognised epiphysal separation may become manifest. We have been unable to find any other reference to this complication in the English literature.

We report two cases in which an apparently uncomplicated posterior dislocation of the hip in an adolescent was converted to a fracture-dislocation of the capital femoral epiphysis following an attempted closed reduction.

CASE REPORTS

Case 1. A girl, aged 12 years, sustained bilateral fractures of the distal radius and a posterior dislocation of the left hip following a fall of about 10 feet from a tree (Fig. 1). Five hours after the accident, closed reduction of the wrists and hip was attempted under general anaesthesia. No great force was required to produce clinical reduction of the hip, but radiographs revealed that a fracture-separation of the capital femoral epiphysis had occurred, the head fragment remaining dislocated (Fig. 2).

Immediate open reduction through an anterolateral approach was performed. There was complete separation of the femoral head at the epiphysis (Salter Type I). The only remaining soft-tissue attachment was a small strip of periosteum. The femoral head was reduced and secured with two Moore's pins (Fig. 3).

After operation, skin traction was maintained for four weeks, followed by non-weight-bearing on crutches for nine months. The fracture united and the femoral head appeared to have survived but on gradual introduction of weight-bearing, segmental necrosis developed (Fig. 4).

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Eighteen months after injury the hip remained painful and stiff. A subtrochanteric osteotomy was performed and this relieved some of the pain.

Case 2. A boy, aged 16 years, sustained a posterior dislocation of the right hip when the car in which he was a front-seat passenger collided with another vehicle. Closed reduction under intravenous diazepam was unsuccessful. Further radiographs showed that the capital epiphysis was still dislocated posteriorly but had been separated from the femoral neck through the growth plate, with considerable displacement.

The hip was explored immediately through a posterior approach and the femoral head was found deep to the gluteus maximus. It was still attached to the neck by a thin strand of retinacular and synovial

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Case 1. Figures 1 to 4—The treatment of a girl, aged 12 years (see text).

tissue, and the intact ligamentum teres was considerably stretched. The head was reduced and fixed with four threaded pins.

After operation, skeletal traction was applied for six weeks with a Steinmann's pin through the upper tibia. The patient was then mobilised non-weight-bearing on crutches for 16 weeks, when the radiographic appearance of the head was satisfactory.

Thirteen months after injury the hip was still painful and stiff and the radiographs showed avascular necrosis. The pins have been removed recently. Arthrodesis may be required later if pain persists.

DISCUSSION

The reported incidence of avascular necrosis following traumatic dislocation of the hip in children is 3 to 10 per cent (Scientific Research Committee of the Pennsylvania Orthopaedic Society 1968; Offierski 1981), with a tendency to poorer results in the older child (Glass and Powell 1961; Funk 1962). Traumatic fracture-separation of the capital femoral epiphysis without dislocation has a significantly worse prognosis (Ratliff 1968), but when there is also dislocation of the epiphysis, a poor result follows in virtually every case (Ingram and Bachynski 1953; Peltokallio and Kurkipää 1959; Rigault *et al.* 1966; Fina and Kelly 1970; Lam 1971; Werkman 1980).

Trueta (1957) has shown that during early adolescence the proximal femoral epiphysis is supplied with blood by the lateral epiphysal arteries and by arteries in the ligamentum teres. In the two patients described, both these sources of blood were seen at operation to be severely compromised, and avascular necrosis was therefore expected.

Separation of the epiphysis must have occurred either at the time of injury or during the subsequent manipulation. If it was caused by the initial trauma, the perichondrial rim must have remained intact since the epiphysis was radiographically undisplaced. If, however, the separation was caused by the attempted reduction, considerable force would have been required. It is possible that a combination of both these factors led to the complication described.

Whatever the explanation, these cases illustrate the importance of exercising great care and gentleness in the manipulative reduction; this should always be performed under general anaesthesia with complete muscle relaxation. If fracture-dislocation does occur, immediate open reduction and internal fixation are necessary, but a poor result must be anticipated.

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