Open reduction of late unreduced traumatic posterior hip dislocation in 12 children

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We present 12 children with late unreduced traumatic posterior dislocation of the hip. All had posterior dislocation and no associated fracture. The dislocation had remained unreduced for a mean period of 20 (6–52) weeks. Open reduction was done in all cases, since none of the hips could be reduced with upper tibial skeletal traction in abduction. All the hips showed varying degrees of avascular necrosis, with preservation of joint space on roentgenograms. 11 children had an excellent outcome, according to the criteria of Garrett et al. (1979), after a follow-up of mean 26 (24–36) months. We suggest that open reduction is a satisfactory treatment for hip dislocation of any duration in children.

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Traumatic dislocation of the hip in children is a rare injury (Pennsylvania Orthop. Society 1968, Schlonsky and Miller 1973, Floyd 1984). Of 1,842 traumatic hip dislocations reported in one series, only 3 occurred in children (Pennsylvania Orthop Society 1968). Large series (Stewart and Milford 1954, Epstein 1973) have shown that this injury is 25 times less common in children than in adults. The available English literature is scarce regarding the treatment of late unreduced traumatic dislocation of hip in children. We found reports of only 10 cases of unilateral and one with bilateral neglected dislocation (Pennsylvania Orthop. Society 1968, Schlonsky and Miller 1973, Gupta and Shravat 1977, Bunnell 1984, Pai 1992). However, it is not uncommon to see patients whose dislocations had remained unreduced until they were able to obtain access to doctors in developing countries like ours. The management in such cases poses a problem, since no method has been shown to be entirely satisfactory. We report the outcome of open reduction in late unreduced traumatic posterior hip dislocations in 12 children.

Patients and methods

12 children (7 boys) between 5 and 10 years of age were operated on in 2 hospitals (UCMS & GTB Hospital Delhi, University Hospital, USM KotaBharu, Malaysia). The dislocations were unilateral and occurred due to falls during play in 11 children and in 1 because of a motor vehicle accident. All were initially treated by the local bonesetters. They attended the hospital because of perisisting pain, deformity and limp mean 20 (6–52) weeks after injury. All had a type I posterior dislocation of the hip (Thompson and Epstein 1973), without an associated fracture, and 1 child had radiographic evidence of myositis ossificans.

The children were treated with proximal tibial skeletal traction (3–4 kg) in abduction for 2–3 weeks. Open reduction was undertaken through a standard lateral approach, since none of the hips could be reduced by traction. The acetabulum was filled with fibrous tissue and the anterior and superior parts of the acetabular labrum were infolded. The soft tissues were excised and the femoral head was reduced concentrically and held in place with a 3 mm Kirschner wire through the caput into the acetabulum.

Postoperatively, 4 children were treated with Russell traction and 8 with skeletal traction. The

Observations in late unreduced traumatic posterior dislocation of the hip in 12 children

A	B	C	D	E	F	G	H
1	10	1	1	12	24	1,3,4,5	1
2	6	2	2	6	24	1,4,5	1
3	8	1	2	6	24	1,4,5	1
4	8	1	2	52	24	1,3,4,5	1
5	10	1	2	52	36	1,2,4,5,6	1
6	6	1	2	24	24	1,4,5	1
7	10	1	2	26	30	1,2,4,5,6	1
8	10	2	2	10	24	1,2,4,5,6	1
9	5	2	2	15	24	1,4,5	1
10	5	2	2	10	24	1,4,5	2
11	8	1	2	11	24	1,4,5	1
12	7	2	2	15	24	1,4,5	1

A Case
B Age in years
C Sex
  1 male
  2 female
D Mode of injury
  1 traffic accident
  2 sport fall
E Interval from injury to hospitalization in weeks
F Follow-up in months after open reduction
G Radiographic findings at follow-up
  1 femoral head normal shape and size
  2 increased radiodensity of femoral head
  3 increased radiolucency of femoral head
  4 preserved joint space
  5 widening of femoral neck
  6 coxa valga
H Results
  1 excellent
  2 good

Kirschner wire was removed at 3–4 weeks and the patients were encouraged to do hip mobilizing exercises in bed. They were allowed gradual full weight bearing after 6 weeks.

The outcome was graded as excellent, good, fair or poor, according to Garrett et al. (1979).

Results

At the follow-up examination, a complete range of hip motion was found in 11/12 children. Standard radiographs of all children showed various degrees of avascular necrosis of the femoral head and neck with preservation of the joint space. Widening of the femoral neck was observed in all cases. 11 children had an excellent outcome and 1 good (Table).

Discussion

Traumatic dislocation of the hip in children differs from that in adults by being less common, requiring less trauma, having fewer associated injuries and complications like traumatic arthritis, myositis ossificans and joint instability, except avascular necrosis (Bunnell and Webster 1980). The incidence of avascular necrosis is 10% in children and the risk is lowest in younger children (Bunnell and Webster 1980). In unreduced dislocations, substantial osteoporosis occurs in the femoral head, indicating an intact circulation (Bunnell and Webster 1980).

In experimental dislocation in rabbits and dogs, Volkmann (1893) noted that fibrous tissue developed and adhered to cartilage in the acetabulum as early as 3 weeks after hip dislocation. 8–10 weeks later, the joint filled with firm fibrous tissue. Miltner and Wan (1933) confirmed these findings in a repeat experiment.

Of the 12 neglected dislocations of the hip in children reported in the English literature, 3 patients had an associated ipsilateral fracture of a long bone and another had a fracture of the pelvis and head of the femur. Closed reduction was achieved in 1 child, who had a less than 3-week-old dislocation. Another child with an 11-week-old luxation underwent open reduction because of an ununited ipsilateral fracture of the femur. Most of the hips were reduced with heavy traction in abduction. 2 hips underwent open reduction and had a good outcome at follow-up, after more than 3 years. The criteria for a good outcome were not specified by the authors.

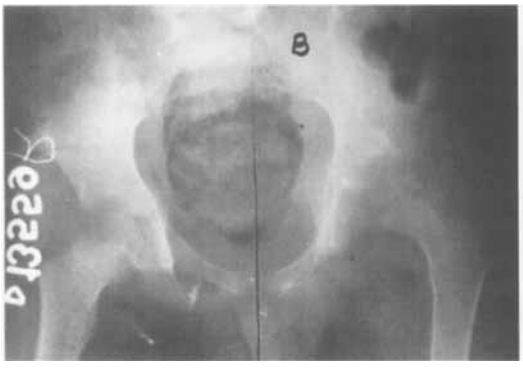
We have not been successful in our attempt to reduce these hips by traction. We found thick fibrous tissue and an infolded acetabular labrum in all cases peroperatively which needed thorough excision for concentric reduction of the hip. Harris (1894), in a classical paper, stated that marked deformity, permanent disability and great suffering resulting from an old unreduced dislocation of the hip have led surgeons at all times to resort to extreme measures to obtain a reduction. Buchanan (1920) concluded that, while open reduction for an old dislocation was usually difficult and not altogether free of danger, it was the best management.

Figure 1. Case 3.

6-week-old posterior dislocation of the hip on left side.

The same child 2 years after open reduction with well-preserved joint space.

Figure 2. Case 6.



24-week-old posterior dislocation of the hip on left side.

The same child 2 years after open reduction with preserved joint space.

Open reduction with a satisfactory outcome has been reported in only 2 children with neglected dislocation (Schlonsky and Miller 1973, Pai 1992). We have achieved an excellent functional outcome in 11/12 such cases.

Avascular necrosis is a common complication which is diagnosed at various intervals following the dislocation. In the first year, two thirds of the patients show radiographic changes suggestive of necrosis, and nine tenths will demonstrate such changes after 2 years. The avascular necrosis is seen radiographically as increased radiodensity, flattening, fragmentation and reossification of the capital femoral epiphysis. Damage to the growth plate leads to shortening of the femoral neck, coxa vara, coxa valga or widening of the femoral neck (Barquet 1982). With mild damage to the ossific nucleus and growth plate, the femoral head regains its normal shape and height. We observed various degrees of avascular necrosis in all our cases.

In children, even with changes suggestive of avascular necrosis and some restriction of motion after open reduction, the anatomically placed femoral head maintains the stimulus for growth of the pelvis and the femur. It prevents deformity and maintains limb length.

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