

# Posterior Dislocation of the Hip

## CLINICAL OBSERVATIONS AND REVIEW OF LITERATURE

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**SUMMARY**

Analysis of 55 posterior dislocations of the hip after trauma are presented with some reference to aetiology, and particular reference to management and complications.

The results compared favourably with reported large series from abroad. Some suggestions are made as a result of our experience, which may help to improve the management of this condition.

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Posterior dislocations and posterior fracture-dislocations of the hip have become relatively frequent due to the great increase in the number of vehicles on the road. They present problems in management, some of which are as yet unsolved.

The purpose of this study is to formulate a rational approach to treatment, based on our experience in the Orthopaedic Department at Groote Schuur Hospital, Cape Town.

**PATIENTS AND METHODS**

Between 1965-1970 100 dislocations of the hip were treated. After excluding 25 patients with central fracture dislocations and anterior dislocations, 75 with posterior dislocations remain, of whom only 55 presented for adequate follow-up at the Outpatient Department, and they are those included in this study.

The ages of the patients ranged from 3 to 59 years, with a mean age of 30 years. The duration of follow-up varied from 3 to 8 years. There were 7 females but only 2 children, aged 3 and 7 years.

According to the classification of Stewart and Mitford<sup>1</sup> our cases were graded as:

- Grade I 30—simple posterior dislocation of the hip without fracture.
- Grade II 10—dislocation with a small fracture of the acetabular rim, stable after reduction.
- Grade III 13—dislocation with larger acetabular fracture, unstable without fixation.
- Grade IV 2—posterior dislocation with fracture of the femoral head or neck.

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**Aetiology**

The mechanism is well known. A force which is directed posteriorly along the shaft of the femur, when the hip is flexed and slightly adducted, causes damage. Thus 17 drivers were involved after head-on collisions, and so were 10 front seat passengers. Fourteen drunk pedestrians and 3 sportsmen sustained similar injuries (Table I).

TABLE I. RELATION BETWEEN CIRCUMSTANCE AND GRADE (TYPE) OF INJURY

Description	Type I	Type II	Type III	Type IV
Driver	11	1	4	1
Passenger	2	5	3	0
Back seat passenger	1	0	0	0
Pedestrian	10	2	1	1
Sports injury	2	0	1	0
Fall from vehicle	3	1	2	0
Unknown	1	1	2	0
Total	30	10	13	2

**Management**

Early reduction is the first step in treatment. Due to difficult circumstances 6 patients underwent reduction more than 12 hours after injury, 7 patients after more than 24 hours, and 13 more than 48 hours after injury (Table II).

TABLE II. RESULTS PLOTTED AGAINST DELAY IN REDUCTION OF THE DISLOCATION

Time from injury (h)	Excellent	Poor and fair	Total
<12	22	7	29
12-24	4	2	6
24-48	6	1	7
>48	7	6	13

Reduction, as a rule, was effected under general anaesthesia, followed by no less than 3 weeks of bedrest in skin or skeletal traction. No patient was left to lie free in bed.

With grades III and IV no strict policy was followed. Six patients underwent primary open reduction with acetabular fixation. Ten others were reduced first of all, but later operated upon to screw their bony fragments together. One grade IV dislocation was managed by primary open reduction with acetabular fixation after the patient had walked on his afflicted hip for 3 weeks.

During the 3 weeks of hospital rest, the distal joints and quadriceps were exercised. No physiotherapy was given to the affected hip.

Ambulation with no weight-bearing was practised at the Outpatient Department for a further 3 weeks. The patient usually achieved full weight-bearing by the end of 12 weeks from the date of injury.

Plaster hip spicas were applied in 12 unreliable patients, who could not be trusted not to walk on the injured hip.

In 52 out of the 55 patients normal walking took place 3 months after their mishap; 3 were delayed for 6 months. A 3 year-old boy was kept in a spica for 3 months, then allowed to walk fully after 6 months. A patient with grade III—very comminuted hip—was deliberately kept from bearing weight for a longer time. One grade I dislocation delayed commencing to walk for no apparent reason.

## RESULTS

### Classification (Tables III and IV)

**Excellent** results represent those in whom no pain, limp or any dysfunction are present, X-ray films are normal and full weight-bearing has been resumed.

**Fair** results are those in whom hip pain is present but not disabling; X-ray film changes are limited to minimal narrowing of joint space, de-ossification, spur formation and capsular calcification; limitation of movement is not gross and there is no limp or deformity.

**Poor** results are those in whom there is continuous pain; X-ray films show progressive osteo-arthritis change, and marked limp and hip dysfunction are present.

### Assessment

**Grade I:** Of the 30 patients, 23 were excellent, 3 were fair, and 4 were poor. The general satisfactory recovery made us analyse the poor results carefully.

One alcoholic patient walked on his dislocated hip for 24 hours before reduction. He was kept in a spica for 6 weeks, commenced full weight-bearing after 8 weeks, but did not attend the Outpatient Department for physiotherapy. He had continuous pain, no X-ray film evidence of osteo-arthritis, and severe limitation in abduction and flexion of the hip.

A 24-year-old schizophrenic was knocked down and dragged by a car. Reduced by closed manipulation within 2 hours of injury, the patient commenced weight-bearing on 1/4 after 3 months. He suffered constant pain. Radiologically there was capsular calcification. He had a 60% limitation of all movements.

A 46-year-old groom fell off a galloping horse. He walked on his dislocated hip for 7 weeks (!) before open reduction. He did not complain of pain before or after the operation. His X-ray films showed severe osteo-arthritis. He had an 80% limitation of movement in all directions and could not return to horse-riding.

TABLE III. RESULTS PLOTTED AGAINST GRADE OF DISLOCATION

Grade (type)	Excellent	Fair	Poor
I	24	2	4
II	8	1	1
III	7	1	5
IV	0	0	2

TABLE IV. COMPLICATIONS ARISING FROM DIFFERENT GRADES OF DISLOCATIONS

Complication	Grade I	Grade II	Grade III	Grade IV
Recurrent pain	2	5	2	0
Malfunction	2	0	3	0
Osteo-arthritis	0	0	3	1
Avascular necrosis	1	1	0	1
Capsular or extracapsular calcification	3	0	2	0
Nerve compression	2	0	0	0

In Table IV the disabilities are summarised in detail. Two patients showed avascular necrosis on X-ray films 12 months after dislocation, and 3 showed heterotopic calcification in the capsule, lateral to the greater trochanter, and in the gluteal mass.

There was sciatic compression in 2 patients. One has residual disability in the form of a mild drop-foot after five years.

**Grade II:** In these 10 patients no open surgery was performed. Eight had excellent results. In 1 avascular necrosis of the femoral head supervened, and one patient otherwise rated as excellent complained of occasional pain and stiffness, which, however, caused him no other difficulties whatsoever.

All the patients were treated by our usual routine, bearing full weight 3-4 months after reduction.

**Grade III:** The over-all results of grade III dislocation are listed in Table III. Of the 13 patients in the group 8 were reduced under general anaesthesia. These waited for definitive surgery for a further 2 days to 3 weeks, before reduction of the acetabular fracture and fixation of the fragment. Four patients underwent primary open reduction with screw fixation of the hip. In 2 of the 4, poor results were encountered in the form of severe continuous pain. One patient, despite walking on his dislocated limb for 4 days before surgery, achieved an excellent result with freedom from pain, normal X-ray film and full function.

Surgery was performed sooner or later in all grade III patients and was carried out through the southern approach. The fragments encountered were reattached to the acetabulum with screws. One excellent result was achieved, surprisingly, in a patient whose hip remained dislocated for a week, was then reduced under anaesthesia, and operated on 3 weeks later. Another excellent result occurred in a 4-day-old dislocation which underwent primary open reduction and acetabular fixation.

All poor results were due to secondary osteo-arthritis of the hip. One patient showed myositis ossificans, and another extracapsular calcification.

In all patients of this group full weight-bearing was resumed within 3-6 months after the completion of surgery.

**Grade IV:** Only 2 patients qualified for this group. One of them had a dislocation of the hip with a third of the femoral head sheared off. Only a closed reduction was done within 6 hours of the injury with no open surgery. Although this patient achieved full weight-bearing after 3 months, his hip was severely damaged by secondary osteo-arthritis and he had severe pain and limitation of movement. The other patient who, in addition to dislocation, fractured the femoral neck, underwent primary open reduction and fixation 3 weeks after injury. He commenced weight-bearing 3 months after surgery but avascular necrosis supervened in the femoral head.

### Over-all Results and Complications (Table IV)

As shown in Table IV, 35 of the patients were graded as excellent results, 5 were fair and 15 poor.

Eight hips showed evidence of osteo-arthritic changes. There was avascular necrosis in 3 patients over-all. Three painful hips showed no evidence of radiological pathology and there was no evidence of any dysfunction. These were therefore not included as poor results. For practical purposes dislocated hips are divided into those requiring surgery to stabilise the hip joint acetabular socket, and those who can be managed conservatively.<sup>1</sup>

## DISCUSSION

Campbell, in *Operative Orthopaedics 1970*, regards a dislocated hip as an emergency requiring urgent reduction. Brav<sup>2</sup> feels that if the delay between injury and reduction exceeds 12 hours, the incidence of avascular necrosis is raised from 17.6% to 56.9%. Stewart and Mitford<sup>1</sup> add that after a delay of longer than 24 hours the end result is uniformly poor for all grades of dislocated hip.

Although we agree with their doctrine and teaching in general, this series shows that they may be unduly pessimistic. Table II shows that even after 48 hours 50% of the cases show fair results. Moreover, not all hips dislocated for days or even weeks give poor results. Prolonged delay in reduction, however, tends to result in complications. When the delay exceeded 12 hours, avascular necrosis occurred in 3 hips. Where the delay exceeded 24 hours several dislocated hips ended up with secondary osteo-arthritis.

Grade II dislocations were all treated conservatively. In the management of grade III injuries there was no uniformity of practice. After reviewing the literature it is still not clear whether one should practice primary open reduction with fixation, or whether it is advantageous to effect primary reduction immediately, and exploration of the hip later.

While Brav<sup>2</sup> feels that surgery increases the incidence of osteo-arthritis, most other authorities disagree. Epstein<sup>3</sup> advocated early surgery for restoring the congruity of the articular surface and the removal of loose fragments. Epstein,<sup>4</sup> 10 years later, reiterated that early surgery is necessary because loose fragments must be removed in order to minimise osteo-arthritic changes in the joint.

Disagreeing with Brav, we propose in the future to follow the doctrine of primary open reduction and acetabular reconstitution. To date our experience is limited by the paucity of patients with grade III and IV dislocations.

No uncertainty exists regarding the sequence of the steps in the immediate postreduction management of the dislocated hip. Traction in bed is followed by a period of non-weight-bearing outside the hospital; then partial weight-bearing and eventually full weight-bearing.

Banks<sup>5</sup> and Armstrong<sup>6</sup> suggest a prolonged period of non-weight-bearing of no less than 6 months. In grades II and III a spica is applied after 6 weeks of traction. The rationale behind prolonged non-weight-bearing is the avoidance of further stress of the already relatively ischaemic femoral head.

At present several authorities disagree with prolonged non-weight-bearing. They contend that because damage to the femoral head is immediate, prolonged avoidance of weight-bearing is not advantageous, nor is it likely to influence the occurrence of avascular necrosis.<sup>1</sup> Rosingh and James<sup>7</sup> have shown experimentally that in dislocation of the hip, damage to the vascularity of the head is immediate.

It is now widely held that the prognosis of a dislocated hip depends on the type and severity of injury and not on the length of the period during which the hip was relieved of weight. Epstein<sup>4</sup> suggests that 3-4 weeks are necessary for healing of the capsule in grade I dislocations. Weight-bearing should be avoided only during this period. In grade II or grade III, 6 weeks are allotted for acetabular union. After this it is not necessary to avoid bearing weight. He reiterates that there is no evidence that early resumption of weight-bearing increases the incidence of avascular necrosis. Campbell, in *Operative Orthopaedics 1970*, says that no more than 2 weeks of non-weight-bearing is necessary in grade I, 6 weeks in grade II, and rather longer than this in grade III.

We have adhered to a simple well-tried scheme: traction in bed for 3 weeks; ambulant but non-weight-bearing for 3 further weeks; and partial weight-bearing for 3 further weeks. Only then does the patient bear his weight fully.

The average figure quoted for avascular necrosis in authoritative papers is about 10%. In this series the incidence was 3 in 55 patients (6%). Avascular necrosis rarely manifests itself clinically and radiologically before

6 months from the date of dislocation. If we really believe that weight-bearing is an important factor, we could even avoid weight-bearing for perhaps 2 years after injury!

Physiotherapy has not been mentioned to any extent in any authoritative series. Watson-Jones<sup>8</sup> felt that early vigorous physiotherapy tended to result in myositis ossificans. On the other hand, Stewart and Mitford<sup>1</sup> recommend early vigorous exercises to prevent arthrofibrosis and to produce favourable functional results.

All our patients received very active physiotherapy, except to the affected joint, while they were inpatients. Unfortunately, after discharge from hospital only a few availed themselves of outpatient physiotherapy. We cannot prove or disprove the importance of physiotherapy. The subjective element is too large. However, our patients in hip spicas, on the whole, did less favourably than those who lay in traction and received active physiotherapy to all except the affected joint.

Age is interesting in that some state that age is unimportant, whereas others<sup>3</sup> feel that younger patients have a better prognosis. Our impression is that patients under 40 years of age did better than those above this age. Elderly patients may suffer from intercurrent disease and concurrent osteo-arthritis. They seem to have a higher incidence of heterotopic calcification.

## CONCLUSIONS

Reduction of dislocation should be effected as early as possible. Delays probably carry a worse prognosis, but are not always as generally disappointing as some authors indicate.

Avascular necrosis develops regardless of weight-bearing, and seems related more to the degree of force applied in the first instance, being possibly worsened by delay beyond 12 hours in treatment.

Earlier general physiotherapy does not seem to increase the incidence of heterotopic calcification, but does seem to improve the rate of rehabilitation quite noticeably.

It seems logical to carry out primary open reduction and acetabular fixation in grade III posterior dislocations.

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