RECURRENT POST-TRAUMATIC DISLOCATION OF THE HIP

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Recurrent dislocation of the hip joint in the absence of a predisposing acetabular defect is rare: so far as we have been able to determine, it has been reported in only eleven adults and eleven children. Sullivan, Bickel and Lipscomb (1955) listed the predisposing causes as acetabular fracture, congenital dysplasia of the hip, sepsis and paralysis, and described an additional case in which the phenomenon was noted after an apparently spontaneous dislocation due to "a simple fall". To the list of contributory causes, it appears that an additional factor may now be added, namely inadequate immobilisation of the hip after reduction, with consequent incomplete healing of the posterior capsular structures. In support of this assumption, we report two hitherto unpublished cases.

CASE REPORTS

Case 1—A man aged twenty-one years sustained posterior dislocation of the right hip when he fell while walking on wet grass in November 1967. He was admitted under our care on the day of the injury. He expressed surprise at the ease with which the joint had slipped out, and claimed that much greater force had been applied when his hip had been dislocated on two previous occasions. The first injury had occurred on the football field, and the dislocation was reduced under general anaesthesia on the same day. The patient was discharged from hospital the following day without further treatment. Recovery was uneventful, and the hip remained normal for five years. The second incident occurred in 1966 and was a sports injury (Fig. 1). On that occasion admission to hospital and reduction of the dislocation had been delayed for thirty-six hours, and a partial lesion of the sciatic nerve was noted on admission. At that time, electromyographic studies indicated neurapraxia of the nerves of the calf muscles, and mixed neurapraxia and axonotmesis of the nerves supplying the muscles of the anterior compartment of the leg. The dislocation had been reduced under general anaesthesia and did

![Fig. 1](image1.png)

Case 1. Figure 1—Radiograph showing second posterior dislocation of the right hip joint. Figure 2—Arthrogram showing some extension of contrast medium suggestive of a posterior capsular lesion.
not present any special problems. It was followed by immobilisation for two months with the aid of a Thomas's splint and skin traction. The patient was then fitted with a drop-foot appliance, which he wore for about five months.

The third dislocation was the result of minor trauma, a fall when he slipped while walking. Examination on the same day revealed posterior dislocation of the right hip, with 2-5 centimetres wasting of the muscles of the right thigh and slight weakness of the dorsiflexors of the right ankle. There was no sensory disturbance. Closed reduction of the dislocation was effected with ease under general anaesthesia, and a Thomas's splint with skin traction was applied. Partial paralysis of the ankle extensors with obvious drop-foot disability persisted.

Arthrography undertaken five days after dislocation before open operation suggested a posterior capsular lesion with extrusion of contrast medium. Unfortunately an insufficient amount of the medium was introduced, so that the result was not conclusive (Fig. 2). In the light of the subsequent findings at operation, a close correlation between the radiographic and the operative appearances could however be shown.

Operation—At operation twelve days after injury the sciatic nerve was found to be involved in a mass of scar tissue from a level just distal to its emergence from the sciatic notch to the lower edge of the quadratus femoris muscle. In addition, a recent haematoma in the region of the nerve was noted. The nerve was dissected free from scar tissue and retracted. A large synovial pouch, which proved to be an extension of the hip joint cavity, was found to emerge between the gemellus inferior and quadratus femoris muscles; it extended from the greater trochanter laterally to the postero-inferior margin of the acetabulum medially. When the pouch was entered there was ready access to the hip joint cavity, which was exposed through a broad cleft in the posterior part of the capsule (Fig. 3). The labrum had retained its attachment to the acetabular margin, but attenuation of capsular fibres permitted abnormal mobility of the labrum in a proximo-distal direction. There was no bony defect of the femoral head or of the acetabulum.

Attempts at redislocation of the hip before repair of the capsule were unsuccessful when moderate force was applied.

Repair of the capsular defect was effected by excising the synovial pouch, and by a "double breast" repair of the lower part of the capsule over the upper with silk sutures.

After operation the limb was supported in a Thomas's splint with skin traction for six weeks. During this time there was marked improvement of sciatic nerve function.

Progress—Five months later the patient did not make any complaint about the hip, but there was some persistent weakness of the extensor muscles of the ankle.

Case 2—A man aged thirty-one years was admitted in April 1968 with a history of five posterior dislocations of the right hip. On each occasion general anaesthesia had been required for reduction.

The first dislocation occurred while he was playing football in July 1961. The dislocation was reduced within an hour of the injury and the patient was discharged on the following day, without further treatment. Recurrences took place two months, two years, two and a half years (Fig. 4) and seven and a half years later, each time with only slight trauma. Reduction of the dislocation was followed by a period of immobilisation only on the fourth occasion,
when the limb was supported in a Thomas’s splint for forty days. There was no evidence of marginal fracture of the acetabulum, and no sciatic nerve involvement.

At the time of his admission examination revealed neither motor nor sensory changes in the right sciatic nerve distribution. Movements of the hip were normal except for medial and lateral rotation which were limited to 35 degrees and 30 degrees respectively. Radiographs revealed no abnormality of the hip joint: arthrography was attempted but failed.

Operation—The hip was exposed through a posterior approach, just as in Case 1. Slight atrophy of the lateral rotators of the hip joint was noted. The sciatic nerve was seen to be enclosed in a sheath of fibrous tissue for a distance of about ten centimetres distal to its emergence from the sciatic notch. It was dissected free and retracted.

A large synovial pouch measuring $5 \times 6.5$ centimetres emerged between the piriformis and gemellus superior muscles. The pouch was opened and the head of the femur exposed. The labrum was still attached firmly to the acetabular rim, and no abnormality of the femur or acetabulum was seen. The defect was repaired by the creation of capsular flaps which were “double breasted” and sutured with silk thread. The flaps were then reinforced with the tendon of the piriformis muscle, which was detached from its insertion into the femur and attached to the posterior capsule across the line of surgical repair. Immobilisation in a Thomas’s splint followed for a period of six weeks.

Progress—Seven months after operation there had been no further dislocation or threat of dislocation.

DISCUSSION

Sullivan et al. (1955) were able to trace only seven cases of recurrent dislocation of the hip, and they reported one other. The condition was first described by Sir Astley Cooper (1844) who recorded a case of a fifty-year-old man who was able by voluntary effort to dislocate and reduce either hip.

Heully cited by Speed (1942) reported a patient with a similar condition, and Bigelow (1900) reported three cases in men, in all of whom only one hip was affected. Hamilton (1875) described two cases of spontaneous recurrent dislocation, as well as a third in which pathological changes in the femoral head and neck were noted and which therefore could not be included in this series. Badgley (1968) reported a single case in which the hip dislocated on the slightest provocation. At operation the acetabular labrum was found to be detached posteriorly. Because of extensive damage to the articular surface of the femoral head, and the detachment of the labrum, it was decided to proceed with arthrodesis.

Townsend, Edwards and Bazant (1969) recorded three cases, two in young men and one in a young child. They advised bone block operation in cases with a shallow acetabulum
and congenital deficiency of the acetabular rim superiorly and posteriorly. With a defect primarily in the soft tissue, they felt that plication repair of the capsule and short rotator muscles posteriorly would probably suffice.

In 264 traumatic dislocations, Brav (1962) noted four cases of redislocation (1.5 per cent). In only one case was concomitant fracture of the acetabulum or head of the femur not detected. Brav made the important observation that redislocation might have been due to inadequate immobilisation after operation and to early weight-bearing after reduction.

Eleven cases of recurrent dislocation have been reported in children. Freeman (1961) described the case of a five-year-old girl who redislocated her hip three months after the initial episode. Treatment after reduction of the primary dislocation consisted of a plaster-of-Paris hip spica for three weeks. Five months later there were signs of aseptic necrosis of the head of the femur.

In a review of the literature Choyce (1924) found five cases of recurrent dislocation of the hip joint in children. It is important to note that aseptic necrosis of the head occurred in a number of these cases.

No one has yet been able to offer a reasoned account of the possible presence of predisposing factors. The method of treatment of the condition remains a matter of personal opinion and we are not aware of the result of a series of cases treated by one or other method. Aufranc, Jones and Harris (1964) described the findings in a child who suffered dislocations at the age of three years, four years and six and a half years, and who was treated by operation for capsular repair with a good result. Hohmann (1964) commented on the rarity of traumatic dislocation in children and the much greater rarity of recurrences. He could recall one case only, in a two-year-old child who had suffered recurrence of dislocation once only. He advocated plaster immobilisation in a hip spica with the joint medially rotated in case of anterior dislocation and laterally rotated in case of posterior dislocation, in order to facilitate approximation of the injured soft tissues.

Funk (1962) described the case of a three-year-old boy in whom reduction of the dislocation was effected only after eight days. Four years later he sustained redislocation of the same hip after a fall, but six and a half years later the joint was still clinically and radiologically sound.

One other child is reported by Masse and Florent (1964), but there remains some doubt whether this case should be included in the present series, because of the possibility of a congenital posterior defect of the acetabulum.

The factors which contributed to recurrence of the dislocation in reported cases appear uncertain, although minor trauma in the presence of an anatomical defect of the acetabulum or femoral head may be inferred in several instances. In the case reported by Sullivan et al. (1955), repeated injury while the patient was under the influence of alcohol could have been an important factor.

By contrast, our two cases appear to offer a plethora of etiological factors, including failure to immobilise the limb after the first reduction, nerve injury complicating the lesion in one case and a delay of no less than thirty-six hours between the dislocation and its reduction.

Failure to immobilise the hip after reduction may or may not be significant, and while there are numerous reports of avascular necrosis of the femoral head following early weight-bearing, only Brav has suggested that this is a possible factor in recurrent dislocation.

Sciatic nerve involvement appears less significant because the distal muscles of the leg are involved and not the muscles of the hip joint. Armstrong (1948) reported seven cases of sciatic nerve palsy in a series of 101 hip dislocations. In six of the seven cases there was displacement of a bony fragment from the margin of the acetabulum into the region of the sciatic notch. In our case reduction of the dislocation was delayed for thirty-six hours, and it might be assumed that the sustained pressure suffered by the nerve caused neurapaxia.

Delay in reduction is generally regarded as a real cause of avascular necrosis of the femoral head, but to the best of our knowledge it has not been recorded as productive of
recurrent dislocation. It must be noted that in our cases there have been no signs of avascular necrosis, even as long as seven years after the initial dislocation. The possibility still exists, however, and it cannot be entirely excluded.

A fourth factor, namely an occult congenital defect of the acetabulum or femoral head, must be considered. There has been no evidence whatever of the existence of such a factor.

The sequence of events leading to recurrent dislocation of the hip are not understood. In the cases reported by ourselves and by others a number of facts emerge: 1) The initial incidents causing traumatic dislocation were undistinguished, and differed in no particular from the more common incidents which were not complicated by subsequent dislocation. 2) Subsequent dislocations following the first episode were the result of minor injury or strain in a significant number of cases. 3) After the first dislocation of the hip there was a significant delay in reduction for periods varying from one hour to nine weeks. 4) Immobilisation of the joint after reduction was for a negligible period in a number of cases. 5) The operative findings in our two cases were almost identical. The predominating feature was a large synovial-lined pouch or false joint cavity, communicating with the true joint cavity through a broad defect in the posterior capsule large enough to contain the femoral head in the dislocated position. 6) It was noted at operation that the surgeon could not redislocate the hip by using moderate force unless he used intra-articular levers. 7) Although the ligamentum teres was not seen in our cases, it may be assumed that it had been ruptured and that it had failed to regain its normal attachment.

CONCLUSIONS

On the basis of the observations listed above we make the following tentative suggestions.

Both the hip joint cavity and the pseudo-cavity contain synovial fluid, which flows freely between the cavities through the capsular defect. Changes of volume within the two cavities undoubtedly occur during normal use of the leg, and the flow of fluid from one cavity to another represents a normal adjustment of unequal intra-articular pressures. Under certain circumstances and with certain critical movements of the hip, an increase of hydrostatic pressure of the fluid within the true cavity of the hip joint could arise, due to temporary closure of the valve-like posterior defect. This pressure differential could be irresistible. Under these circumstances the head of the femur could be forced across the acetabular rim, through the capsular defect and into the pseudo-cavity with its temporary "hypotension". The fact that considerable force applied to the hip at operation failed to produce dislocation serves to emphasise the efficacy of the normal pressure mechanism that retains concentric reduction of the hip. Conversely the fact that the recurrences occurred with only minimal exertion and "with surprising ease" in a number of cases lends weight to the theory that dislocation was the result of a hydrostatic situation.

The development and persistence of the pseudo-cavity or pouch in communication with the hip joint has been only rarely reported in dislocation of the hip. The most important factor in its formation is probably delay in reduction of the dislocation. Once a cyst wall of sufficient strength is established it will hold fluid and will expand, as a result of intermittent distension. Obliteration of the pseudo-cavity by operation appears to be an adequate solution to the problem, and there have been no failures of the procedure reported.

SUMMARY

1. Two cases of recurrent post-traumatic dislocation of the hip are reported.
2. The literature is reviewed and the rarity of the condition is emphasised. Only twenty-two cases have been previously reported, eleven in adults and eleven in children.
3. The sequence of events leading to recurrent dislocation is not understood but the following important facts emerge. The initial incident could not be distinguished from that causing uncomplicated dislocations. There was a significant delay in reduction in a number of cases.
Subsequent dislocations followed minor injury. A large defect in the posterior capsule with a large synovial-lined pouch or false joint was found at operation in both our cases. The ligamentum teres was not seen at operation. The surgeon was unable to redislocate the hips during the operation.

4. In both cases reported here treatment was by excision of the posterior pouch and repair of the capsular defect.

5. Based on the above facts some tentative deductions are made.

Permission to publish is acknowledged to Colonel J. Gilliland, Officer Commanding, No. 1 Military Hospital, South African Medical Corps, Voortrekkerhoogte, Pretoria; and Dr P. N. Swanepoel, Medical Superintendent, H. F. Verwoord General Hospital, Pretoria. We wish to thank Dr H. S. Venter for his assistance in the treatment of the first case.

REFERENCES


HEULLY: Cited by Kellogg Speed (1942).


