POSTERIOR DISLOCATION OF THE SHOULDER

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The purpose of this paper is to discuss certain factors that determine recurrence in both anterior and posterior dislocations of the shoulder, and to consider the treatment of primary posterior dislocation. My observations are based upon a case of posterior dislocation reduced by operation, and upon experiments in which the glenoid labrum was detached from the margin of the glenoid fossa in a monkey.

CASE REPORT

A carrier aged sixty-one years awoke one night to find himself sitting on the floor, with no knowledge of how he got there. Four days later he complained of stiffness of the left shoulder, and radiographs showed a posterior dislocation, with an extensive defect of the humeral head (Fig. 1). The patient was not aware of any previous dislocation, but he recalled having had a "seizure" nine years before. The dislocation was reduced, and the reduction was confirmed radiographically. The limb was supported by a sling and binder. After a week a further radiograph showed that the dislocation had recurred spontaneously, without the knowledge of the patient and while the arm was still supported. The shoulder was in the typical position of partial abduction and medial rotation.

Operation—At operation there was found to be an extensive labral and capsular detachment. There was no fracture of the glenoid margin and no evidence of a congenital defect of the glenoid fossa. The humeral head defect was demonstrated, and it was clear that the notch was compressed against the glenoid rim by the combined action of the stretched capsule and the muscles. This made reduction difficult, even under direct vision. Reduction could be achieved only by forcibly extending the arm and rotating it laterally while direct pressure was...
applied upon the humeral head from behind. In this way the humeral head could be lifted over the edge of the glenoid. The dislocation could be readily reproduced, under anaesthesia, by placing the arm in the customary sling position of adduction and medial rotation and applying gentle backward pressure upon the humeral head. It seemed clear that retention of the limb in this usual sling position was an important factor in the early redislocation. After

the operation the arm was supported on a frame with 60 degrees' abduction and in lateral rotation and full extension for six weeks. So far the shoulder has remained stable, and function is normal.

**DISCUSSION**

The first factor that tends towards recurrence of a shoulder dislocation is delay in diagnosis. It is obvious that the chance of effective repair becomes less the longer the shoulder remains dislocated. The remaining factors that require consideration are the damage to the head of the humerus, the manner and duration of retention of the shoulder after the dislocation has been reduced, and the nature of the soft-tissue injury and its capacity for repair.

**THE HUMERAL HEAD DEFECT**

In general, the greater the defect of the humeral head the more readily recurrence of the dislocation may be expected to occur. With each dislocation the defective area is impinged forcibly against the glenoid rim, and it is likely that the defect becomes deepened with successive dislocations.

**RETENTION AFTER REDUCTION**

In anterior dislocation, the sling position of adduction and medial rotation is stable, provided the limb is fixed adequately. In assessing stability after posterior dislocation it is helpful to remember the mechanism of the dislocation. In the mechanism of any indirect primary dislocation, and to a less degree the direct form, the humeral head leads through the
capsule, leaving the soft tissues behind it relatively undamaged. If, therefore, the head is replaced to face the opposite direction, the undamaged structures are relatively taut—the first requirement towards stability. In posterior dislocation this position would be lateral rotation. If the arm is also extended at the shoulder the stability becomes so complete that redisplacement cannot be produced with ordinary force. Dislocation would entail distraction of the relatively taut, intact, anterior soft structures (Fig. 2).

This position of stability in posterior dislocation allows the best possible approximation of the stripped labrum and capsule to the margin of the glenoid and the neck of the scapula.

**THE SOFT-TISSUE INJURY AND ITS REPAIR**

King (1947) believed that there was no essential difference in causation between the single dislocation and the dislocation that becomes recurrent. Watson-Jones (1948) quoted a large series of cases of anterior dislocation adequately retained for four weeks, without the complication of recurrence. Perkins (1953), however, restated the doubt about the natural capacity for repair of a detached glenoid labrum. I do not know whether union of the labrum anteriorly has ever been demonstrated after the generally successful Bankart type of repair. Operative repair is still uniformly successful if the labrum is excised. It is desirable to know the natural capacity for repair of a stripped labrum because of the relationship of the capsule to the labrum at the glenoid rim. It may be assumed from the clinical results that stripped capsule is capable of union with subjacent rawed surfaces.

**EXPERIMENTAL INVESTIGATION**

Thanks to the collaboration of Professor J. Vernon Luck of Los Angeles and Professor Kellogg Speed of Chicago, a study of the reparative capacity of the stripped labrum has been made in a monkey, Macaca mulatta. In both shoulders the posterior aspect of the joint was exposed. On the left side a vertical incision was made in the capsule near the glenoid
labrum, and the labrum was split longitudinally throughout its posterior and inferior aspects. On the right side the capsule was incised at the margin of the attachment of the labrum, which was avulsed from the glenoid posteriorly and inferiorly. After the operation only the muscles and skin were closed.

The length of the rent in the labrum stopped short of allowing the shoulder to dislocate and so avoided the need for post-operative fixation, which is impossible in this animal. The condition produced on the right side simulated a reduced posterior dislocation tear of the capsule and labrum.

Before the animal was killed at eight weeks arthrographs were made of both shoulders. These showed no extra-articular extrusion of the medium (Figs. 3 to 4).

From the specimen shoulders sent by Professor Luck sections were made through the control shoulder (left) and through the site at which the labrum had been avulsed in the right shoulder (Fig. 5). Macroscopically, the previously avulsed glenoid labrum appeared to be firmly reattached to the bone. Histological examination was carried out by Dr Vincent Rudd. In the left shoulder the junction of the glenoid cartilage with the capsule of the joint and the glenoid labrum showed no abnormal feature (Figs. 6 and 7). In the right shoulder this junctional area showed a narrow strand of tissue where cell nuclei were more prominent than in the adjoining tissue. It was not possible to demonstrate any discontinuity of tissue (Figs. 8 and 9).

Comment—It may be reasonably concluded from these observations that the avulsed glenoid labrum does in fact possess a capacity for repair in the monkey, and Professor Joseph Shellshear, who studied the specimens, believed that the analogy would be applicable to man.

In primary posterior dislocation the position that affords the greatest stability—namely lateral rotation and extension—also favours cicatrisation in the best way to buttress the union at the site of the stripping, just as medial rotation and adduction do after reduction of a primary anterior dislocation. Reasonable repair would not be expected in less than four weeks, with sound repair at six weeks. Watson-Jones (1948) reported one case in which repair of an anterior detachment of the labrum through a superior incision, entailing no anterior scarring, did not prevent recurrence. There would be an adequate buttress in his series of primary anterior dislocations properly retained for four weeks in medial rotation.

Statistical comparison between anterior and posterior dislocations is of little guidance because of the relatively small incidence of posterior dislocation and the fact that reduction is often delayed on account of misdiagnosis.

SUMMARY

1. At an operation for recurrent posterior dislocation of the shoulder observations were made on the mechanism, head defect, method of reduction, and the position of greatest stability.
2. Experimentally, avulsion of the glenoid labrum in a monkey was shown to be capable of sound repair without operation.
3. In the treatment of primary posterior dislocation it is suggested that the position of abduction, lateral rotation and extension is favourable for the approximation of the stripped labrum and capsule to the glenoid rim, and for an effective buttress after cicatrisation.
Fig. 6

Fig. 7
Left shoulder. High-power photomicrograph of the junction of glenoid labrum and articular cartilage at the line A-B in Figure 5 and at site A in Figure 6.
Fig. 8

Fig. 9
Right shoulder. High-power photomicrograph of junction of glenoid labrum and articular cartilage at line A-B in Figure 5 and at site A in Figure 8. Note the sound healing at the site of avulsion.
4. If the risk of recurrence is to be reduced to a minimum the shoulder should be retained in the position of greatest stability for at least four weeks, to allow firm union of the avulsed soft tissues.

5. This position for an optimum buttress would also apply after surgical repair for recurrent posterior dislocation.

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REFERENCES


