

Posterior shoulder dislocation

Muscle and capsular lesions in cadaver experiments

In 10 cadaver shoulders, a posterior subspinous dislocation of the humeral head was provoked. All specimens showed total rupture of the posterior capsule and teres minor muscle, in most cases together with partial lesion in the infraspinatus muscle. In the majority of the specimens, lesions were also seen in the lower part of the subscapular muscle and in the proximal part of the anterior capsule.

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After Cooper (1839), several papers (Boyd & Sisk 1972, Dorgan 1955) have described the posterior dislocation in the shoulder and the different forms of treatment (Detenbeck 1972, Scott 1967). However, the lesions that may arise in this kind of dislocation have not been reported. We have studied the lesions in the stabilizing structures around the shoulder joint in subspinous dislocation of the humeral head using cadaver specimens.

Materials and methods

Each of the 10 specimens used in the investigation consisted of the entire rotator cuff and capsule including the coracohumeral ligament. The long biceps



Figure 2. Radiograph of shoulder joint specimen with the humeral head dislocated to the subspinous position.

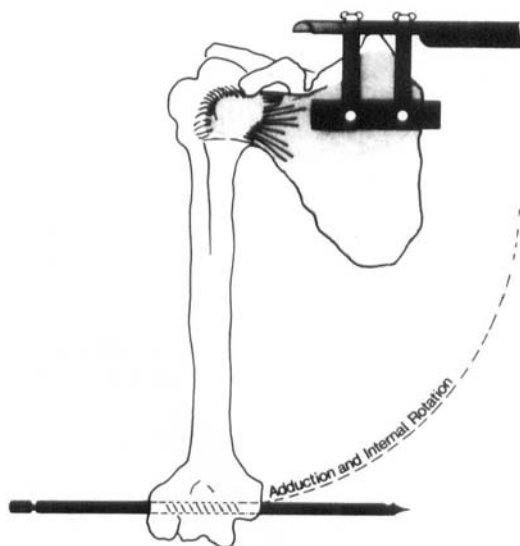


Figure 1. Experimental set-up.

tendon was divided just below the intertubercular groove, and the rest of the humerus was dissected free of all soft tissue. A nail was inserted transversely into the humeral condyle, and each specimen was suspended in a device in which the corpus of the scapula was fixed with two bolts. In suspending the scapula, the medial border was held in a vertical position (Figure 1). In this way, by adducting the humerus 30 degrees and gradually increasing the internal rotatory force manually by the nail, the humeral head was dislocated in the posterior subspinous position (Figure 2). After each experiment, the lesions in the structures around the joint were recorded.

Table 1. Lesions in posterior dislocations of the humeral head in subspinous position.

Structure	Intact	Rupture	
		Partial	Total
Lig. coracohumerales	10	—	—
M. supraspinatus	10	—	—
M. subscapularis	2	8	—
Proximal third of anterior capsule	4	2	4
Middle third of anterior capsule	2	7	1
Distal third of anterior capsule	3	7	—
Posterior capsule	—	—	10
M. infraspinatus	—	9	1
M. teres minor	—	—	10

Results

Lesions to the coracohumeral ligament or the supraspinatus tendon were not noted in any of the specimens (Table 1). Lesions of the subscapular muscle appeared in its substance just medial to the tendinous part. The anterior capsule was partially or totally torn from the humeral neck. Conversely, the posterior capsule was ruptured at the scapula in 9 specimens and at the humerus in 1 specimen. The labrum was never torn off together with the posterior capsule. Lesions in the infraspinatus muscle were seen in the tendinous part in all specimens with partial or total ruptures.

A lesion in the teres minor muscle without fracture was always observed in the tendinous part near the insertion at the greater tuberosity.

Discussion

Only a single type of total posterior dislocation of the humeral head, the subspinous one, has been described (Wilson & McKeever 1949, Moseley 1972), and no account has been given of its pathology. Flower (1861) described lesions to the posterior part of the cuff at the insertion on the greater tuberosity, and Rowe and Yee (1944) found in two operations for posterior shoulder joint dislocation a posterior capsule tear close to the labrum glenoidale. Nobel (1962) also observed the tear of the labrum or capsule in posterior shoulder joint dislocations. Detenbeck (1972) reported laxity of the posterior capsule in recurrent posterior traumatic dislocations.

Clinically, posterior dislocations of the humeral head occur with the humerus in adduction

and internal rotation (Dorgan 1950, Gladden 1956, Michaelis 1950). The clinical situation probably differs from the experimental one in that lesions in joint displacement are time and force dependent (Frankel & Nordin 1980). Thus, the lesions noted in this investigation are minimal lesions to be expected compared with the clinical dislocations that probably occur faster and with greater force.

In addition to lesions of the posterior structures, the nearly constant finding of lesions of the anterior cuff and capsule indicates that these structures also contribute to the stability of the joint (Ovesen & Nielsen, in press).

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