

FRACTURES OF THE SURGICAL NECK OF THE HUMERUS

A Study in Reduction

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Fractures of the surgical neck of the humerus are commonly grouped into adduction and abduction types, each the product of a definite mechanism, and each presenting a characteristic radiographic pattern. This simplifying of former modes of classification is advantageous not only in describing the displacement, but also in determining treatment. It is considered that a fall on the outstretched hand and the forcible adduction or abduction of the patient's arm following the moment of impact, according to the movement of the trunk, is the main sequence of events culminating in one or other type of fracture. The abduction variety is probably commoner in adults, whereas in children adduction deformity invariably occurs (Aitken 1936, Watson-Jones 1943).

The ordinary antero-posterior radiographs show the type of fracture, with or without impaction. Appearances in such films, however, can be deceptive, and in order to ascertain the full extent of the deformity, additional views should be taken—namely, the lateral or transaxillary projection with the tube directed into the axilla of the abducted arm and the cassette placed above the shoulder. If pain prevents the assumption of this position without anaesthesia, a transthoracic projection similarly will disclose the true nature of the lesion, and complete the radiographic evidence. In six of the seven cases referred to in this article, the fractures were characterised by marked rotation of the humeral head and anterior displacement of the shaft, such deformity being fully demonstrated only in transthoracic views, as the ordinary antero-posterior films gave little or no indication of its existence (Blackett and Healy 1937).

When such a displacement occurs reduction is difficult to achieve, because the surgeon is usually unable to control during manipulation the short, rotated, and abducted humeral head.

SURGICAL ANATOMY

The capsular ligament of the shoulder joint, essentially a cylindrical sleeve, is attached to the anatomical neck of the humerus superiorly, just medial to the greater and lesser tuberosities. It adheres closely to the articular margin, gradually falling away in front and behind, until on the infero-medial aspect it encroaches on the shaft half an inch from the articular surface of the head. The tendons of the supraspinatus superiorly, the infraspinatus and teres minor posteriorly, and the subscapularis anteriorly, although partly separated from the capsule by the subscapular bursa, blend with the ligament near their insertions, strengthening it and during contractions prevent its being nipped between the articular surfaces (Jamieson 1945, Cunningham 1951).

With certain fractures of the surgical neck of the humerus the proximal fragment, consisting of the humeral head, tends to assume an abducted and laterally rotated position from the selective pull of the supraspinatus and infraspinatus muscles; and in addition some degree of flexion results from contraction of the subscapularis. The distal fragment—that is, the shaft of the humerus—tends to be drawn and rotated medially; it is also displaced anteriorly in relation to the head by the action of the powerful muscles inserted into the bicipital groove—namely, the pectoralis major, latissimus dorsi, and teres major. Shortening is usually present.