COMMON SURGICAL PROCEDURES ABOUT THE SHOULDER JOINT

W. SHEPHERD-WILSON, M.L.M., MB.BS. (Lond.), F.R.C.S. (Eng.)*

Summary

Details of surgery to the shoulder joint, relating to the rotator cuff and acromioclavicular joint, repair of recurrent dislocation of the shoulder joint and stabilisation of a destroyed or functionless joint, are described. Indications for rehabilitation are given.

In this article it is my intention to explain to the therapist some of the common surgical procedures that are currently performed with a special reference to the type of post-operative physiotherapy that is needed.

Before understanding the surgical procedures, a thorough knowledge of the anatomy is essential — this has been dealt with in a separate article by: Ioné Sellars on pages 4-6 of this issue.

From the surgical point of view there are three types of operative procedures:

• Operations relating to the rotator cuff and its association with the acromioclavicular joint.
• Operations relating to recurrent dislocations of the shoulder and its repair.
• Operations to stabilise a destroyed or functionless joint.

No mention will be made of the more unusual or esoteric operations, for instance, repair of recurrent posterior dislocations of the shoulder or to arthroplasty of the shoulder, the latter tending still to be in the experimental or early developmental stage.

OPERATIONS RELATED TO THE ROTATOR CUFF SYNDROME

Removal of the calcification from the bursa or the supraspinatus tendon can be performed by either needling or a surgical approach, remembering beforehand that conservative treatment of this particular lesion in about 90% of cases will give a satisfactory result and it is only the small percentage which remains with persistent symptoms that need surgery.

Needling

This is indicated for calcification of the rotator cuff tendons. The needling procedure must be done under sterile conditions and the patient’s shoulder must be properly draped and cleansed. The skin and the deep structures are anaesthetised with a local anaesthetic, such as Procaine. The needle is directed into the calcifying area and grating and excision can be felt upon reaching it. This can be verified if the deposit is then forcefully injected with Procaine in the syringe and then sucked back when a few white particles float into the fluid syringed. If this has been achieved a larger needle can be inserted in a parallel direction and, by repeated injection and aspirations, some or most of the calcium deposits can be removed. With local anaesthesia, there is very little pain experienced during this procedure. It is usual to follow this wash-out with 1 ml. of a long-acting Cortisone preparation.

Surgery

A direct anterior vertical approach into and through the deltoid muscle onto the supraspinatus tendon insertion will allow the calcified mass to be visualised and then curetted and irrigated. It is a more sure method than needling but needs a general anaesthetic instead of a local for needling and therefore has an increased morbidity.

Decompression of the Subacromial Bursa

This can be achieved by either anterior or partial acromioplasty. The anterior acromioplasty was described by Neer (1972) and involves an incision in the anterior aspect of the subacromial bursa by making a saber cut across the top of the acromion and down the anterior aspect of the deltoid muscle for about 5 cms. The deltoid is then dissected carefully off the acromion on its anterior aspect, the subacromial bursa opened, and then an inspection can be made of the supraspinatus and infraspinatus tendons at their insertions onto the humerus. The compression force over the subacromial bursa consisting of the coraco-acromial ligament and the anterior aspect of the acromion is removed. A good decompression can be obtained and should give lasting relief of this chronic condition.

The author also finds that partial acromioplasty of a larger degree than that described by Neer (1972) gives long-lasting results for those who wish to be active in the overhead sports, such as tennis and badminton. In partial acromioplasty, the anterior half of the acromion is removed including the lateral portion of the acromioclavicular joint. The deltoid in both these operations is repaired and meticulously sutured to the tissues that remain.

Repair of Ruptures of the Supra- and Infraspinatus Tendons

If the rupture is small and situated in the supraspinatus tendon area this can be repaired with the same approach as described above by Neer for decompression of the subacromial bursa. However, if the damage to the rotator cuff is in its superior aspect it cannot be visualised adequately through the anterior approach. Then the approach of Kessel (1977) should be used in which an incision is made posteriorly over the supraspinatus fossa across the border of the acromion and 4 cm down into the deltoid muscle. The dissection is carried deeper, the trapezius muscle and deltoid are stripped off the acromion process, which is now laid bare and can be divided with an osteotome or Gigli saw and held apart. Full visualisation of the supraspinatus tendon is then possible; if it is ruptured, it can be repaired from this approach comparatively easily by suturing the ruptured

*Principal Orthopaedic Consultant to Groote Schuur Hospital and University of Cape Town. Received 11 February 1982.
Exposure of the shoulder joint

The origin of the coraco-brachialis and the short head of the cephalic vein are retracted and the plane deepened to approach. This approach is anterior to the shoulder joint, glenoid from the rim of the glenoid, leaving a defect into the shoulder joint. The du Toit (1956) procedure. The significant feature of this procedure is the re-insertion of the subscapularis muscle laterally across its insertion. If, the rupture is a partial or complete destruction of the shoulder joint due either to a shoulder joint as a counter-weight via an overhead abduction. Repeated dislocation leads to the syndrome is associated with osteoarthritis of the shoulder joint. The underlying pathology of this condition was beautifully recorded by Bankart (1923). The Du Toit staple is held elongated expanded capsule of the shoulder joint back onto the neck of the scapula. In this approach the subscapularis muscle is split in the line of its fibres to expose the defect, the capsule of the joint is reattached and the position is held with a Du Toit staple inserted with a special introducer. Bristow Procedure

For those shoulders that have a tendency to recurrent dislocation with the underlying pathology of epilepsy, a more radical procedure may be performed as described by Bristow, whose operation was recorded by Helfet in 1958. In this procedure, the tip of the coracoid process, with its attachment of the coraco-brachialis and the short head of biceps muscles, is pre-drilled and then osteotomised and, with a screw just entering the pre-drilled hole of the coracoid process together with its muscular attachments, are inserted through the split subscapularis muscle and the screw is driven home into the neck of the glenoid. Post-operative care

The limb is immobilised with a Velco dressing and a sling to prohibit external rotation. In two to three weeks the sling is removed during the day but is worn at night for three further weeks. Then rehabilitation exercises are begun. At six weeks abduction of the shoulder to 90° is allowed and at 8-12 weeks, the motion of the joint should be maximum except that abduction and external rotation may be somewhat limited; the latter being desirable.

Stabilisation of the shoulder joint

This procedure is called for when there is persistent pain in a partially or completely destroyed joint due either to...
chronic infection, such as tuberculosis or rheumatoid arthritis or when there is gross instability as a result of paralysis of the muscles supporting and controlling movements of the shoulder joint, as seen in poliomyelitis or disruption of an irreparable brachial plexus.

Arthrodesis of the Shoulder

This will stabilise the joint and the trapezius muscle with its accessory nerve supply provides motor power for the stiffened joint, allowing a useful range of function of the shoulder girdle at the scapulo-thoracic region.

The position in which the shoulder should be arthrodesed is open to considerable debate but the most commonly recognised position is that with the arm abducted at the glenoid by 50°, flexed on the glenoid by 15° - 25° and externally rotated at the glenoid by 25°. This allows the hand to reach the mouth when the elbow is flexed. Arthrodeses of the shoulder are either extra-articular or intra-articular, the latter often combined with internal fixation.

The extra-articular arthrodesis as described by Watson-Jones (1933) is a technique denuding the acromion process and splitting the greater tuberosity with the arm abducted. The acromion process is fractured and inserted into the "V"-shape slot created by the osteotomy of the greater tuberosity of the humerus. The arm is then held in its corrected position by applying a shoulder plaster of Paris spica for three months.

In the technique of Brittain (1942), the extra-articular arthrodesis is achieved by a long strut of tibia placed posteriorly between the shaft of the humerus and the lateral border of the scapula. Post-operatively the shoulder is immobilized in a spica for three months.

Intra-articular arthrodesis of the shoulder joint is probably best performed by a method described by Gill (1931), who makes a dorso-lateral semi-circular incision across the shoulder joint, exposing and denuding the inferior and superior surface of the acromion, leaving the periosteum intact proximally. After denuding head of the humerus and glenoid of articular cartilage, the humeral head is then split longitudinally forming a cleft into which the denuded acromion process fits when the arm is abducted. This can then be reinforced by the insertion of two or more long metal cancellous screws through the neck of the scapula, which adds internal fixation of the arthrodesis. Post-operatively the arm has to be kept in the correct position by the use of an abduction shoulder spica for three months.

After-care

The shoulder spica is retained for a 12-week period. When clinical and radiological union is established, exercises can be started, always remembering that when the shoulder spica is removed it should be bivalved in the first instance so that the arm can be lifted out of its abduction position and early exercise commenced for at least a week before removing the spica as a whole. If this is not done the patient experiences excessive pain. Thereafter mobilisation of the remains of the shoulder girdle function must be obtained by gentle exercises over a period of three months.

References


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