Research Paper

Volume : 2 | Issue : 10 | October 2013 • ISSN No 2277 - 8179

Shoulder Joint - Adhesive Capsulitis Treatment Methodology

Medical Science

KEYWORDS : Adhesive Capsulitis, manipulation under anesthesia, peri-articular injection, physiotherapy, shoulder

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ABSTRACT

The shoulder joint is the most commonly dislocated large joint. Sudden violence applied to the humerus with the joint fully abducted tilts the humeral head downward onto the inferior weak part of the capsule, which tears, and the humeral head comes to lie inferior to the glenoid fossa. During this movement the acromion has acted as a fulcrum. The strong flexors and adductors of the shoulder joint now usually pull the humeral head forward and upward into the subcoracoid position. Posterior dislocations are rare and are usually due to direct force on the shoulder of the patient form front, the rounded appearance of the shoulder is seen to be lost, since the greater tuberosity of the humerus is no longer bulging laterally beneath the deltoid muscle. The subglenoid displacement of the head of the humerus into the quadrilateral space may cause damage to the axillary nerve, as indicated by paralysis of the deltoid muscle and loss of skin sensation over the lower half of the deltoid.

The shallowness of the glenoid fossa of the scapula and the lack of support provided by weak ligaments make this joint a very unstable structure. Its strength is almost entirely dependent on the tone of the short, muscles that bind the upper end of the humerus to the scapula, namely, the Subscapularis in front, the Supraspinatus above, and the Infraspinatus and Teres minor behind. The tendons of these muscles together as referred as rotator-cuff. The least supported part of the joint lies in the inferior location, where it is unprotected by muscles.

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The rotator cuff, consisting of the tendons of the Subcapularis, Supraspinatus, Infraspinatus, and Teres minor muscles, which are fused to the underlying capsule of the shoulder joint, plays a very important role in stabilising the shoulder joint. Lesions of the cuff are common causes of pain in the shoulder region. During the movement of abduction of the shoulder joint, the supraspinatus tendon is exposed to friction against the acromiom process. Under normal conditions the amount of friction is reduced to a minimum by the large subacromial bursa, which extends laterally beneath the deltoid.

Degenerative changes in the bursa are followed by degenerative changes in the underlying supraspinatus tendon, and these may extend into the other tendons of the rotator cuff. Clinically, the condition is known as subacromial bursitits, supraspinatus tendinitis or pericapsulitis. It is characterized by the presence of a spasm of pain in the middle range of abduction.

In advanced cases the necrotic supraspinatus tendon may become calcified or may rupture. Rupture of the tendon seriously interferes with the normal abduction movement of the shoulder joint. It will be remembered that the main function of the supraspinatus muscle is to hold the head of the humerus in the glenoid fossa at the commencement of abduction. The patient with a ruptured supraspinatus tendon is unable to initiate abduction of the arm. However, if the arm is passively assisted for the first 15 degrees of abduction, the deltoid can then take over and complete the movement to a right angle. The synovial membrane, capsule, and ligaments of the shoulder joint are innerved by the axillary nerve and the suprascapular nerve. The joint is sensitive to pain, pressure, excessive traction, and distension. The muscles surrounding the joint undergo reflex spasm in response to pain originating in the joint, which in turn serves to immobilize the joint and thus reduces the pain.

Injury to the shoulder joint is followed by pain, limitation of movement, and muscle atrophy due to disuse. It is important to appreciate that pain in the shoulder region may be caused by disease elsewhere and that the shoulder joint may be normal; for example, diseases of the spinal cord and vertebral column, and the pressure of a cervical rib can all cause shoulder pain. Irritation of the diaphragmatic pleura or peritoneum can produce referred pain via the phrenic and supraclavicular nerves.

Movement	Muscles Involved
Flexion : Axis is perpendicular to axis of abduction and adduction.	-Clavicular head of Pectoralis Major -Anterior Fibres of Deltoid -Coracobrachialis and assisted by biceps brachii
Extension: Axis is perpendicular to axis of abduction and adduction.	-Posterior fibres of Deltoid -Teres major -Latissimus dorsi -Pectoralis major
Abduction: Axis is parallel to plane of body of scapula.	-Supraspinatus -Middle fibre of Deltoid. -Subscapular, Infraspinatus, Teres minor.
Adduction: Axis is parallel to plane of body of scapula.	-Anterior and posterior fibres of deltoid. -Pectoralis major -Teres major -Latissimus dorsi -Coracobachialis.
Medial rotation: Axis is vertical, passes from centre of humeral head to capitulum	-Pectoralis major, anterior fibres of Deltoid, Teres major, Latissimus Dorsi, Subscapularis
Lateral Rotation: Axis is vertical, passes from centre of humeral head to capitulum	-Infraspinatus, Teres Minor, posterior fibres of Deltoid.

Table: 1

Adhesive capsulitis has been a problem in all countries in all times because of it's obscure etiology, varied pathological process, and improper therapeutic measures, though it is a common shoulder lesion affecting the middle ages and elderly persons both males and females. This is an isolated incidence in life of a patient, who appears to be healthy and who continues to remain otherwise healthy. The same pathology does not appear to affect joints other than shoulder. Most amazing feature of adhesive capsulitis is that being a virtually completely stiff join it can spontaneously resolve and lead to a work-able condition and no single treatment has emerged as only effectively treatment or superior to other.

Material and method:-
This prospective study was conducted in between January 2010 and july 2012. A total 72 cases were selected with a minimum 6 months post-treatment follow-up.

Patients selected for study having pain and stiffness of shoulder and mild osteoporosis. Patients with diabetes mellitus, rheumatoid arthritis, hyperthyroidism, locked posterior and anterior dislocation, sub-acrominal impingement syndrome and rotator cuff lesion of disease duration more than6 months were 6 months were excluded from the study.

These patients were randomly allocated in 3 groups each comprising 24 patients designated as M, I, P and treated by (1) manipulation under anesthesia. (2) peri-articular injections (3) Physiotherapy respectively .All the patients are advised for active shoulder mobilization exercises.

Manipulation under anesthesia:-
Under general anesthesia manipulations were done in the sequence of flexion, extension, abduction, adduction, external rotation and internal rotation. Analgesics were given post manipulation period for two to three days and shoulder mobilization exercises were started 3-4 days after manipulation which was taught previously.

Peri-articular injections:- Injection methylprednisolone in 40 mg dosage was given intra-articularly by anterior approach under strict aseptic preparation. Average 3 doses with 3 weeks interval were given.

Physiotherapy:-The patients were treated by physiotherapy on OPD basis in the department of physical medicine. Following methods were used: (a) Active and passive shoulder mobilization exercises. (b) Shoulder wheel and pulley exercises. (c)US Therapy. (d) Other methods like short wave diathermy, electrical stimulation, IFT not used as it may act as confounding factor and affect the study.

Observations:
Results were evaluated and compared only after 6 months of study.

Results were evaluated on the basis of clinical improvement of certain clinical parameters .They are: (1) Pain, (2) Tenderness (3) Muscular atrophy and (4) Range of movement (ROM) of shoulder at different planes. The clinical results were graded as below for a fast review-

Good-no pain, no tenderness present ROM is equal or comparable to normal limb of the patient .no muscle wasting seen or observed.

Fair-mid pain or tenderness was observed. Mild restriction in movements ROM was noted even after six months. Muscle wasting may or may not be present.

Poor-pain and tenderness noted along with gross restriction of range of movements with or without muscle wasting.

Discussion-
Primary aim in the treatment of the adhesive capsulitis of shoulder joint is to achieve a painless shoulder with fairly good range of movements in a shorter duration of treatment along with active and passive movements .In our study we have seen patients having a wide range of age, forty to seventy years of age, having sedentary life style, with almost equal sex ratio and almost equal involvement of the right or left limb or shoulder with two patients having bilateral involvement of shoulder. Among 72 patients, 33 patients came with a history of two months, 24 reported a history of 2 to 4 month of shoulder involvement, remaining patients after an involvement of more than 4 months but less than 6 month of shoulder involvement. Painful restriction of movements at shoulder joint, specially abduction and lateral rotation along with medial rotation were classic features of capsulitis of shoulder joint. A dull and vague pain almost like ace around and at shoulder which classically gets worse during night and at rest is a constant feature. All patients' exhibited pain and tenderness at shoulder joint involved except 4 patients. Radiological osteoporosis was found in 50 patients. Radiological changes were not seen in 22 patients. In the literature manipulation under anesthesia as a Nobel method of treatment has been recommended and promoted by many authors, who observed good outcomes in their studies. Peri-articular injections with corticosteroids also have been used and recommended in past as one of the good and fast pain relieving methods in shoulder capsulitis cases with proven results.

Physiotherapy in the form of active shoulder mobilization exercises is a well-known and old method of treatment but studies in literature do not support the claim as result are not uniform in various studies.

Conclusion:
It may be concluded all the three methods used for remedial process for shoulder capsulitis are patient friendly simple and can be performed at OPD basis and are quite effective and easily reproducible. Though better results are observed in group of patient treated by manipulation under anesthesia and by articular injections than in group treated by physiotherapy .The group treated by physiotherapy has an advantage of noninvasive and need no anesthesia and anesthetics doctor.

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