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RESEARCH ARTICLE

COMPARISON OF MANIPULATION UNDER ANAESTHESIA (MUA) AND PERIARTICULAR INJECTIONS IN THE CLINICAL MANAGEMENT AND REHABILITATION OF FROZEN SHOULDER

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ABSTRACT

The shoulder joint or glenohumeral joint is a synovial, multiaxial, spheroidal between the roughly hemispherical head of the humerus and shallow glenoid fossa of the scapula. Synovial membrane lines the fibrous capsule of the joint. This fibrous capsule may become inflamed and later thickened and constricted. This tightening combined with the pain restricts the joint movement. Frozen shoulder is a condition of varying severity characterized by the gradual development of global limitation of active and passive shoulder motion where radiographic findings other than osteopenia are absent. Frozen shoulder is also referred to as adhesive capsulitis, painful stiff shoulder, and periartthritis. This study was performed to compare and evaluate the results following treatment of adhesive capsulitis by manipulation under anaesthesia (MUA) and by periarticular injections. Also the study will show the results of different pharmacological agents used for periarticular injections (i.e. Methyl Prednisolone and Triamcinolone). This study was focused on subjects with complaints of pain and restriction of movement of shoulder joint attending the orthopedic clinic of Katihar Medical College as well as referred cases from district and peripheral hospitals.

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INTRODUCTION

According to Codman (1934), "this a difficult group of cases which I find difficult to define, difficult to treat more difficult to explain from the point of view of pathology" (Codman, 1934) What was told by Codman more than seven decades ago remains true even today in the era of arthroscopy and computer aided surgery. The enigma of frozen shoulder has been a challenge to our profession for many decades. It has been a problem in all countries in all times because of its obscure etiology, varied pathological processes, and improper therapeutic measures. Although this is a common shoulder lesion affecting the middle aged and elderly persons both males and females, very little attention has been paid to this ill understood subject especially in our country. The subject by its peculiar features has drawn attention of many workers from time to time. Some features are worth mentioning. 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 ankylosed joint it can spontaneously resolve and lead to a workable condition,

though it may be a myth. Probably for this comforting myth that frozen shoulder is self limiting about which an orthopedic surgeon can do very little, the apathy and nonchalance grew up for this subject. The prevalence of frozen shoulder is estimated to be 2 to 5 percent of the general population (Morén-Hybbinette, *et al.*, 1987; Reeves, 1975). It is a common shoulder lesion affecting the middle aged and elderly persons both males and females and is an isolated incidence in life of a patient, who appears to be healthy and who continues to remain otherwise healthy. The condition is most common in the fifth and sixth decades of life, with the peak age in the mid-50s. Onset before the age of 40 is rare.

Women are more often affected than men. The non-dominant shoulder is slightly more likely to be affected. In 6 to 17 percent of patients, the other shoulder becomes affected within five years (Rizk, 1982). Frozen shoulder occurs predominantly unilaterally and is usually self-limited, although often the course is prolonged, lasting over two to three years (Grey, 1978). Some studies suggest that up to 40% of patients have persistent but mostly mild symptoms beyond three years, and 15% have long-term disability (Simmonds, 1949; Binder *et al.*, 1984; Hazleman, 1972; Hand *et al.*, 2008; Shaffer *et al.*, 1992). In our day-to-day practice, we encounter enormous volumes of patient with this ailment and no single modality of treatment has emerged to be effective or superior to another.

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MATERIALS AND METHODS

This study was conducted on 50 subjects in the Department of Orthopaedics, Katihar Medical College & Hospital, Katihar after obtaining prior permission from Institutional Ethics Committee (IEC). The cases included in this study were patients with pain and stiffness of shoulder joint without any other pathology. Patients with mild osteoporosis or having tenosynovitis of long head of biceps brachii were also included in the study. Patients having signs and symptoms of adhesive capsulitis of shoulder along with pre-existing Diabetes Mellitus, Rheumatoid Arthritis, Hyperthyroidism, Locked posterior and anterior dislocation and Rotator Cuff Lesions were excluded from the study.

Cases were selected on the basis of medical history followed by shoulder joint examination with special emphasis on glenohumeral joint movement. Relevant laboratory and radiological examinations were conducted. All the patients selected were then treated randomly by Manipulation under Anesthesia (MUA) and by Periarticular Injection (PI). Shoulder mobilization exercises were advised to all the patients during the period of treatment and patients were advised followed up for six months.

Observations

Results were evaluated on the basis of clinical improvement of certain parameters which are as follows: Pain, Tenderness, Muscular Atrophy and Range of Movement (ROM) of shoulder joint at different planes.

The clinical results were graded as below for quick review:

- Good -- No pain, no tenderness present. ROM is equal or comparable with normal limb. No Muscle wasting present.
- Fair -- Mild pain and tenderness may or may not be present. Mild restriction of ROM still present even after 6 months. Muscle wasting may or may not be present.
- Poor -- Gross restriction of movement still present.

In this study out of 50 patients, 20 were treated by MUA and 30 were treated by Periarticular injections – (12 treated by Inj. Triamcinolone and 18 by Inj. Methyl Prednisolone). 20 patients were treated by MUA. In all cases general anaesthesia was administered. The manipulation was done in the sequence of flexion, extension, abduction, adduction, external rotation and internal rotation. Home based active shoulder mobilization exercises were taught previously.

In the meantime analgesics and anti-inflammatory was given. The patients were instructed to begin exercises 3-4 days after MUA. In this study, good results were found in 16 cases and fair results in 4 cases.

Table I. Age Incidence

Average age -	
Age	No
Up to 40 yrs	03
41 - 50	26
51- 60	18
61-70	02
71 & Above	01

Minimum age - 40 yrs Maximum age - 73 yrs.

Table II. Sex Incidence

Male	Female
27	23

Table III. Side of Affection

Rt. shoulder	Lt. shoulder
24	26

Table IV. Duration of Disease

<2 Months duration	23
2 - 4 mo.	13
4 - 6 mo.	08
> 6 mo. duration	06

Minimum duration -- 7 days
Maximum duration -- 8 months

The results are as follows:

Table V. MUA

Good	16
Fair	04
Poor	00

Good Result – 80%
Fair Result – 20%

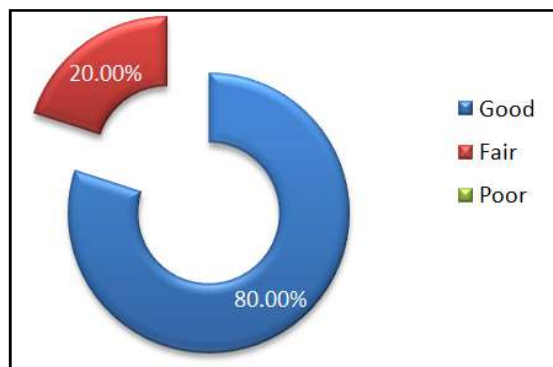


Fig 1. Results of MUA

Table VI. Periarticular injections

Good	23
Fair	07
Poor	00

Good Result – 76.6%
Fair Result – 23.4%

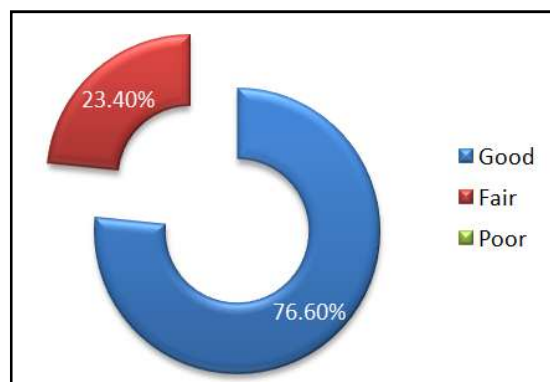


Fig 2. Results of Periarticular Injections



Fig 3A, 3B, 3C. Before MUA



Fig 4A, 4B. Manipulation under Anaesthesia



Fig 5A, 5B, 5C: After MUA



Fig 6A, 6B: Periarticular injection

DISCUSSION

The aim of this study was to review the clinical observation and to evaluate the results of treatment of adhesive capsulitis by different methods. The fact upon which the treatment is based is that, adhesive capsulitis if allowed to continue will affect the structural and mechanical integrity of the joint. Consequently the smooth gliding action of the joint and its range of movements are lost which is associated with pain. The loss of range of motion and strength results in the loss of physical independence. The primary aim in the treatment is painless shoulder with reasonably good range of motion both active and passive. So the success is said to be achieved not only in providing pain relief but also in providing a good functional shoulder. In the present study along with the results of treatment of adhesive capsulitis the clinical status of the patients were also studied.

The age and sex distribution of cases has also been studied. It was found to be slightly more common in males (54%). Regarding age incidence maximum no. of cases were found between 40 and 60 years of age (88%). Side of involvement, right shoulder was affected in 24 cases and left shoulder in 26 cases. There was no case found with bilateral affection. In this study it was observed that subjects with sedentary habits were commonly affected. Pain was a constant feature in almost all cases. Pain in the affected shoulder is one of the early features of the disease. Typical night pain (intensity of pain increasing at night interfering with sleep especially at late hours) was present in some patients. Following treatment the intensity of pain gradually diminished. Muscular atrophy was observed in 38 patients. Deltoid muscle atrophy was observed in 18 patients. In 14 cases atrophy of Supraspinatus and in 6 cases atrophy of both of Supraspinatus and Infraspinatus was observed. Except 4 cases all patients had tenderness over shoulder either in anterior aspect or all over the shoulder. Investigations revealed mild osteoporosis in 37 cases in the proximal humerus. However no radiological changes were found in remaining 13 patients. On USG of shoulder, mild fluid collection was found in bicipital groove in 7 patients.

In the literature MUA as a method of treatment was promoted by many authors. Dodenhoff *et al.* showed that manipulation under anesthesia can provide early improvement of shoulder function and that it is generally a safe procedure (Dodenhoff *et al.*, 2000). Peri-articular injections with corticosteroids are also used widely as a treatment method in adhesive capsulitis with proven success. Even success with oral corticosteroids has been cited in literature. In my series I treated 30 patients with Peri-articular injections. Amongst them 18 patients were treated by Inj. Depomedrol (Methyl Prednisolone) and 12 were treated by Inj. Triamcinolone (40 mg/ml.). In both the cases 2ml Lignocaine (1%) was also used.

Injections were given with full aseptic precautions. Uniformly good results were found in all cases except 7 cases where fair results were found. No difference was found between Inj. Methyl Prednisolone and Inj. Triamcinolone as far as outcome is concerned. Average 3 injections with 3 weeks interval were given. In few cases 5 doses were required for the improvement. Besides these, numerous methods of treatment are mentioned in the literature including X-ray therapy, saline distension of the joint, suprascapular nerve block and more recently arthroscopic releases to mention a few discussion of which is beyond the present study.

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