



# “TO SEE THE EFFECTIVENESS OF MAITLAND MOBILIZATION TECHNIQUE ON SHOULDER COMPLEX (AC, SC, ST, GH JOINT) ON PAIN AND FUNCTION IN PATIENT WITH FROZEN SHOULDER: AN EXPERIMENTAL STUDY”

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## ABSTRACT

### Background and purpose:

Frozen shoulder is one of the most common conditions encountered by persons where there is global restrictions of the range of motion of shoulder joint. There has been little evidence that alone GH mobilization is effective but shoulder complex mobilization will be more fruitful. This study was done to check whether whole shoulder complex (Acromioclavicular joint, sternoclavicular joint, scapulothoracic joint and glenohumeral joint) mobilization is effective.

### Outcome measures:

- 1) SPADI: shoulder pain and disability index: - to assess the pain and disability of patient
- 2) VAS: visual analogue scale: - to assess pain

### Method:

15 participants were recruited for the study. All the participants were screened for inclusion criteria. Participants following into inclusion criteria were recruited for the study then were assessed for pre intervention

And then were given treatment in the form of Shoulder complex mobilization along with exercises and IFT

All the participants were treated for 4 weeks. All the participants were then assessed for outcome measures pre and post intervention.

### **Result:**

All the participants showed significant improvement in improving function and reduction of pain in frozen shoulder with statistical significance in VAS with  $p=0.036$  and SPADI with  $p=0.000$ ,

### **Conclusion:**

The study concluded that that statistically & clinically shoulder complex (AC, SC, ST, SC joint) mobilization are more effective in improving pain and function in patients with frozen shoulder.

### **Keywords:**

Frozen Shoulder, Maitland Mobilization, Shoulder Complex

## **MANUSCRIPT**

### **INTRODUCTION**

Frozen shoulder syndrome (FSS) is a condition of uncertain etiology characterized by a progressive loss of both active and passive shoulder motion<sup>1</sup>. The bones of the shoulder complex include the bones of the shoulder girdle; the clavicle and scapula; and the humerus, sternum, and rib cage. These bones form four typical joints: the glenohumeral (shoulder joint) sternoclavicular, acromioclavicular, and scapulothoracic joints. There is a fifth functional joint, the coracoacromial arch, which describes the region where the head of the humerus is covered by the acromion and the coracoacromial ligament. All these joints must be considered together in discussing the shoulder, as any motion of the glenohumeral joint also occurs at each of the other joints. The shoulder is the most mobile joint in the body with the least stability; therefore, it is one of the most frequently injured joints in the body.

Intervention consisted of the Codman exercise 9, shoulder wheel exercises 10, self-stretching exercises 11, and finger ladder exercises 12, and self-stretching exercises (for improving abduction, flexion, external rotation, internal rotation, and horizontal adduction). For improving the abduction, patient was sitting with the side next to a table, the forearm resting with palm up and patient was asked to slide his or her arm across the table, remaining in this position for 10 seconds, relax in starting position, and repeat it for 10 times. Similarly for improving the flexion the client was asked to slide the forearm forward along the table, remain in this position for 10 seconds, relax in starting position, and repeat it for 10 times. For improving the lateral rotation, the client stood standing and facing a doorframe with the palm of the hand against the edge of the frame and elbow flexed 90.

**SPADI –**

Shoulder pain and disability index are a practicable, reliable and valid instrument, and can be recommended for the self-assessment of shoulder pain and function.

**VAS- visual analogue scale**

The VAS is an instrument with good validity, excellent reliability, moderate distribution-based responsiveness and good anchor-based responsiveness compared to multi-item questionnaires. Its use is recommended in clinical trials to assess global quality of life.

**MATERIALS AND METHODS**

**SOURCE OF DATA:** Parul Sevashram Hospital, Physiotherapy OPD.

**RESEARCH DESIGN:** Experimental Study

**SAMPLING:** Convenient sampling: All the subjects with pain in shoulder joint with diagnosis of Frozen Shoulder.

**SAMPLE SIZE:** 15 participants were recruited for the study.

**INCLUSION CRITERIA:**

1. Complaint of global restriction of range of motion of shoulder joint more than 2 months.
2. Age- 40 to 60 yrs.
3. Patient suffering from diabetes without neurological involvement.
4. Male and female both.

**EXCLUSION CRITERIA:**

1. History of fractures around shoulder joint.
2. Any inflammatory disorders around shoulder joint.
3. Any other musculoskeletal condition of the shoulder.
4. Any neurological involvement.

**Procedure**

The subject for the study were selected from the Parul Sevashram hospital, Physiotherapy OPD and peripheral Physiotherapy OPD under PSH, Parul University. Patient with shoulder pain were assessed by the therapist. 18 subjects were chosen for treatment of shoulder pain. Out of 18, 3 subjects were excluded because some had injuries in shoulder and some had undergone surgeries following fracture. Those who

fit to inclusion criteria were assessed and explained in details about the study and their role and importance of study. All the patients were asked to give a written informed consent form. Once the subjects signed the consent, each patient was assessed with SPADI for functional affection and VAS for pain.

Maitland mobilization of shoulder complex along with conventional physiotherapy was given to every patient along with 3 types of exercises namely codman's exercise, wand exercise and finger ladder exercise and IFT in common:

### **Maitland mobilization for glenohumeral joint**

**Postero – Antero glide:** To increase extension and external rotation In this, patient is in prone lying with arm in resting position over the edge of the table, supported on therapist thigh .to stabilize acromion with towel. Therapist is in standing with leg closer to the table in a forward stride position, support the patient arm against therapist thigh with outside hand, the arm positioned on your thigh provides grade 1 distraction .place the ulnar border of your other hand just distal to the posterior angle of acromion process, with your finger pointing superiorly, this hand gives the mobilizing force. Glide the humeral head anterior and slightly medial direction.

**Antero – Postero glide:** To increase flexion and internal rotation In this, patient is in supine with the arm in resting position .therapist is in standing with back to the patient ,between the patient trunk and arm, patient's arm support against therapist trunk, grasping the distal humerus with therapist lateral hand, this position provide grade 1 distraction to the joint. Place the lateral border of your hand just distal to the anterior margin of the joint. This hand gives the mobilizing force. Glide the humeral head posterior direction.

**Caudal glide:** To increase abduction. In this, patient is in supine lying shoulder is abducted 550, horizontally adducted 300, rotated so the forearm in the horizontal plane. Therapist one hand in the patient's axilla to provide grade 1 distraction, the web space of your other hand is place just distal to the acromion process. Mobilizing force with the superiorly place hand; glide the humerus in an inferior direction.

**Glenohumeral joint distraction:** In this, patient is in supine lying shoulder is abducted 550, horizontally adducted 300, rotated so the forearm in the horizontal plane. Therapist one hand in patient's axilla to provide grade 1 distraction.

**Maitland mobilization for shoulder complex (GH, ST, SC, and AC joint)**

**Scapulothoracic joint:** To increase scapular motion of elevation, depression, protraction, retraction, rotation, upward and downward rotation and winging Patient is in side lying .therapist is in standing and place superior hand across the acromion process to control the direction of motion .with the finger of therapist inferior hand, scoop under the medial border and inferior angle of scapula and move the scapula in desiring direction by lifting from inferior angle or by pushing on acromion process.

**Sternoclavicular joint**

**Posterior glide:** To increase depression of the clavicle In this patient is in supine lying .place therapist thumb on the anterior surface of the proximal end of the clavicle. Flex index finger and place the middle phalanx along the caudal surface of the clavicle to support the thumb. For Posterior glide: push with therapist thumb in posterior direction Superior glide: push with therapist index finger in a superior direction.

**Anterior glide:** To increase elevation of the clavicle Patient is in supine lying, with therapist fingers are place superior and thumb inferiorly around the clavicle. For Anterior glide: fingers and thumb lift the clavicle anteriorly. Caudal glide: finger press inferiorly.

**Acromioclavicular joint**

**Anterior glide:** To increase mobility of the joint. Patient is in sitting position, therapist stand behind the patient and stabilize the acromion process with finger of therapist lateral hand, the thumb of therapist other hand pushes downward through the upper trapezius and is place posteriorly on the clavicle just medial to the joint space and therapist's thumb pushes the clavicle in anterior direction.

**Duration of treatment:** Alternately 3 days per week for four weeks.

**Repetition:** 15 glides-3sets

**General Exercises:**

**Wand exercise:** To initiate active assisted range of motion using a cane, wand in standing position. Motions typically performed are flexion, extension, abduction, internal and external rotation.

**Pendulum exercises:** In this patient is in standing with trunk flexed at the hips about 90°.arm loosely hangs downward in a position between 60° and 90° elevation. A pendulum or swinging motion of the arm is initiated by having the patient move the trunk slightly back and forth..Motions of flexion, extension and horizontal abduction, adduction and circumduction can be done. If the patient experiences back pain over use the prone position, adding a weight to the hand causes a greater distraction force on GH joints.

**Finger ladder exercises:** The shoulder finger ladder can be wall mounted, which allows the patient to use the equipment in either a sitting or a standing position. The ladder is divided into 36 steps, separated by 1.25" intervals along one piece of smooth hardwood.

### **Interferential therapy:**

Given to the subject of both groups Instruction and warning: the patient was asked to keep the part still relaxed and to report if any increase of pain or other sensations immediately. Preparation of the patient: the skin should be wash properly. The nature of the treatment and stability of the area all are explained to the patient. The duration of the treatment as well as any particular cooperation required as indicated. Preparation of the part: The patient was made to sit on a chair well supported according to the area to be treated. The couplant was applied on a skin surface. Setting up: the patient should be place in comfortable position Frequency: 80 to 120 Hz Intensity: Just below the pain threshold Time: 20 minutes. Application: IFT was given in relaxed position, 4 suction type electrodes were placed around shoulder region in coplanar arrangement

Termination: The intensity was turned to zero. The skin was cleaned of couplant with cotton. The electrodes were cleaned after each use with noncorrosive, non-abrasive antiseptic lotion. Duration of treatment: IFE treatment for 10 sessions over 4 weeks.

## **RESULT AND INTERPRETATION**

As already mentioned out of 18 patients only 15 were falling inclusion criteria out of which only patients were included for the study as the rest were not willing to participate in the study Therefore the result presented here are of 30 patients of who 7 were females and 8 were males. All of these suffering from shoulder pain their main complain was pain during overhead activities, heavy weight lifting and also difficulty in daily activities because of pain and restricted ROM. ~~the~~ The comparison of SPADI score for functional assessment in Group B. the comparison was done through paired t test. The p value of Group B comparing pre and post treatment score of SPADI is 0.000. The p value is <0.05 which shows that Group B is significant in improving SPADI score.

## **DISCUSSION**

This study is done to investigate that whether Shoulder girdle mobilization(AC,SC,ST,GH joint) for shoulder muscles when combined with IFT and general exercises helps in improving pain and quality of life in patients with frozen shoulder. Glenohumeral mobilization has recently received increased interest as an effective in expensive and noninvasive treatment in frozen shoulder due to inability to reduce pain and improve muscle strength.

In spite of growth of new techniques in physical therapy like shoulder girdle mobilization (AC,SC,ST,GH joint), still we are unaware of its effect as a treatment for frozen shoulder with advancement in technology. The novelty of this study is to focus on helping patient with frozen shoulder using shoulder complex mobilization(AC,SC,ST,GH joint) as a new treatment which will help them in reducing pain, improving muscle strength and improving functional disabilities caused due to frozen shoulder. This study also

focuses on creating awareness among physical therapist to use shoulder complex mobilization (AC, SC, ST, GH joint) as a part of treatment protocol while addressing patient with frozen shoulder.

According to the analysis: P-Value less than 0.05 seen and is highly significant according to mean of VAS and SPADI.

## CONCLUSION

The final conclusion of the study is that, Shoulder complex mobilization showed significant improvement in function and pain reduction in patient with frozen shoulder This concludes that shoulder complex mobilization is more effective in reducing pain and improving function.

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