Comparing the Effects of Maitland Mobilization Technique Versus Exercise with Therapeutic Ultrasound in Adhesive Capsulitis

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Abstract

Background: Adhesive capsulitis is an inflammatory condition that causes discomfort and stiffness in the shoulder which has a prevalence of 2% to 5%. Hence this research work is done to check the efficacy of Maitland mobilization technique versus Exercise with therapeutic ultrasound in adhesive capsulitis.

Purpose: To find out the effects of Maitland mobilization technique & exercise with therapeutic ultrasound in adhesive capsulitis.

Materials and Methods: Total of 28 participants were selected from Vijay physiotherapy clinic and divided into two groups. Group A was allocated with 14 participants and managed with Maitland mobilization technique and ultrasound. Group B 14 participants were managed with exercises and ultrasound for 4 weeks. The participant’s intervention effects were assessed using VAS, SPADI Scale and Range of motion Study Period: November 2022 to July 2023.

Result: This study results showed a significant (p value 0.0001) reduction in pain and improvement in shoulder disability values and ROM of adhesive capsulitis participants in group A (Maitland mobilization technique and Ultrasound) compared with group B (Exercise and Ultrasound).

Conclusion: This study found that the Maitland Mobilization technique as well as Exercise both seems to be effective in treating adhesive capsulitis. But the patients in Maitland Group show greater improvement than the exercise group.

Key Words: Adhesive capsulitis, Mobilization, Maitland, Ultrasound.

Introduction

Adhesive capsulitis, often known as frozen shoulder, is an inflammatory condition that produces pain and stiffness in the shoulder.¹ Patients between the ages of 40 and 60 are most frequently affected by adhesive capsulitis, which has a prevalence of 2% to 5%. The majority of affected patients are postmenopausal women for unclear causes. Diabetes, hypothyroidism, hyperthyroidism, hypoadrenalism, and any other hormonal imbalances are examples of systemic risk factors.² Adhesive capsulitis

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comes in two varieties: primary and secondary. Primary idiopathic adhesive capsulitis may be the first symptom of Diabetes mellitus. Secondary conditions can occur as a result of shoulder injuries or immobilization. Frequently, frozen shoulder develops in three stages: the painful freezing, sticky freezing, and melting phase. There are several linked factors for adhesive capsulitis, despite the fact that its aetiology is unknown. Clinically, the treatment for adhesive capsulitis involves joint mobilization, such as the oscillatory techniques of Maitland and the sustained stretch technique. It has been advised to passively extend the shoulder capsule and tight soft tissues using mobilization techniques in order to restore their normal extensibility. The three types of mobilization that Maitland, Kaltenborn, and Mulligan advise are mobilization with movement (MWM), end-range mobilization (ERM), and mid-range mobilization (MRM). The traditional approaches to treating adhesive capsulitis focus on reducing discomfort, preserving range of motion, and ultimately regaining function. An effective treatment for adhesive capsulitis is joint mobilization. Although Maitland Mobilization and Exercise have received substantial support in the literature and in research studies, none of them have demonstrated one method is more successful than the other for treating adhesive capsulitis. Pain and stiffness in the shoulder are treated by Maitland Mobilization using a passive oscillatory approach, which is graded from Grade I to IV according to intensity. Grade I describes a modest amplitude intensity that is supplied at the beginning of the joint’s range of motion (ROM), when there is no stress on connective tissue, when there is significant discomfort. While Grade II describes an intensity that is provided from the start of the joint ROM to the midway with a somewhat larger amplitude. Grade III is applied with a significant amplitude between the midpoint of the joint’s range of motion and the beginning of the limitation. Finally, Grade IV is administered to the confined area of the joint while resisting the tissue resistance at a small amplitude. By applying in a shorter tissue, oscillation stimuli of grades III and IV are employed to cause a stretching to reduce joint stiffness. The primary goals of the majority of exercise programs are to lessen discomfort and enhance the gleno-humeral range of motion (ROM) that has been decreased due to capsular contracture. In addition to manual therapy techniques conventional exercises can also be given to get effective results. Exercises that can be performed include the Codman’s and Pendulum exercises as well as isometric scapular retraction, rotator cuff workouts, wall crawling exercises, and active aided range of motion exercises. One of the most popular ways for ACS patients to relax their muscles is through thermotherapy since heat increases tissue temperature and local blood flow, which reduces stiffness in the muscles and joints. Modalities are tangible tools utilized to achieve the intended therapeutic outcome. Particularly, it is known that ultrasonic therapy (UST), which is frequently used to treat ACS, causes molecular vibrations that aid in the breakdown of the capsule’s thick collagenous components. When ultrasonic energy travels through tissue or another attenuating medium, the wave’s amplitude diminishes over time.

Aim

To find out the effects of Maitland mobilization technique & exercise with therapeutic ultrasound in adhesive capsulitis.

Material and Method

Based on inclusion and exclusion criteria, 28 patients with a confirmed diagnosis of adhesive capsulitis were chosen from Vijay Physiotherapy Clinic for the research. By using the convenient sampling approach, they were separated into two equal groups, each of which had 14 patients. Before group division, the patients were given a thorough explanation of the treatments and evaluation process and given the opportunity to provide their agreement. Study Period: November 2022 to July 2023.

Inclusion Criteria

• An X-ray or MRI that shows an adhesive capsulitis diagnosis.
• Capsular pattern restriction of active and passive ROM
• A minimum of one month of shoulder soreness.
• Pain prevents you from sleeping on the affected side.
Exclusion Criteria

- People who have had shoulder surgery in the past
- Serious shoulder damage within six months.
- Shoulder arthritis or previous dislocations.
- Patients who may have rotator cuff tears.

Outcome Measures

- The Shoulder Pain and Disability Index (SPADI)
- The VAS (Visual Analogue Scale)
- Shoulder Range of Motion.

Procedure

**Group A:** Maitland Mobilization Technique with ultrasound.

The therapist was standing, holding the proximal end of the humerus, maintaining a lateral humeral distraction in the center of its range, while the patient was lying face up with their arm bent at a 30-degree angle. Anteroposterior, poster anterior glide mobilization was done five times, each time for 30 seconds, at a speed of 2-3 glides per second. This was done in five sets of five. The approach was used for four weeks (12 sessions), three times each week.

**Group B:** Exercise with ultrasound

The patients in this group were given the following exercise, pendulum or Codman’s exercise, isometric scapular retraction, active and passive range of motion, wall creeping exercise. All of these were given for 4 weeks.

**Codman’s Pendulum Exercise:**

- Bent over front waist using good arm for support on a table
- Let sore arm hang loosely
- Shift weight from front leg to back leg so arm wiggles simply
- Move the arm side to side and front and back. Given for 3 minutes 5 times per day.

**Finger Ladder Exercise:**

- Patient facing a ladder that is suspended over a wall.
- The injured hands should be placed over the ladder at a low level, the patients requested.

- Once at the top, the finger ladder will gently descend back to the bottom, where it will then slowly ascend again.

**Isometric Scapular Retraction:**

- Make the patient to sit comfortable in the chair with their elbow rests on their thigh
- Ask the patient to sit erect with spine straight and ask to retract the shoulder
- Ask then to hold it for 15 secs and continues for 5 sets 10 repetition

**Wall Creeping Exercise:**

- Without flexing the elbow, place your hand against the wall.
- Try to lift your arm as high as you can while slowly nipping your fingers up against the wall.
- Hold the arm in the maximum position for a few seconds before lowering it gradually.

Ultrasound was administered to both groups of patients in an effort to treat their discomfort. The patient was properly positioned for therapeutic ultrasound treatment with parametric settings of 1 MHz frequency. 10 minutes of treatment time in continuous mode with a transducer of 5 cm2 and 1.5 W/cm2 of intensity. Ultrasound was administered by rotating the treatment head slowly, circularly, and overlapping over the anterior, superior, and posterior portions of the shoulder after covering the coupling media (aqua sonic gel) in the transducer.

Data Analysis

Using descriptive and inferential statistics, the acquired data was tabulated and evaluated.

![Fig-1 Group A-Pre and Post test values of SPADI and VAS](image-url)
Result

Two equal groups of 14 and 14 patients each were formed from a total of 28 patients. The difference between the SPADI pretest and posttest scores in Groups A and B is statistically significant. The average improvement was 22.943 in Group A and 52.900 in Group B. In terms of SPADI scores, both groups have shown statistically significant improvement. The difference between the two groups in the post-treatment reading at the conclusion of the fourth week was determined to be statistically significant, with Group A demonstrating more improvement than Group B. The difference between the pretest and posttest values for the pain score is statistically significant for both groups, i.e. Group A and Group B. The average improvement was 3.21 in Group A and 6.00 in Group B. The improvement in Pain ratings was statistically significant for both groups. A statistically significant difference between the two groups was detected in the post-treatment reading at the conclusion of the fourth week, and Group A demonstrated greater progress than Group B, much like SPADI.

Furthermore, the range of motion in the shoulder varies. Flexion (170.36), Extension (42.14), Abduction (166.43), Internal Rotation (56.79), and External Rotation (78.93) are the movements with the highest mean values in Group A. In contrast, the average
values for Group B are as follows: Flexion = 117.86, Extension = 33.93, Abduction = 114.64, Internal rotation = 37.50, and External rotation = 43.21. There was evidence of statistical significance for both Group A and Group B’s mean improvement. This study therefore concludes that Group A has improved more than Group B in terms of pain, disability, and range of motion.

Discussion

The study’s goal is to ascertain if the Maitland mobilization technique and exercise with ultrasound treatment are effective at promoting range of motion and reducing pain in adhesive capsulitis. Both groups had statistically significant results, but the Maitland group outperformed the exercise group, according to the study’s findings. Based on the outcomes measured by VAS, SPADI, and ROM, the findings were drawn. In 2018 Dr. Abdullah Al Shehri, conducted study between Maitland Mobilization technique and Ultrasound therapy in adhesive capsulitis condition, concluded that Maitland’s group demonstrated greater progress than the Ultrasound group. The results demonstrated that both interventions produced beneficial results, but when comparing the interventions’ most beneficial results, the Maitland approach implemented an impressive rate of recovery in regaining pain-free range of motion in comparison to ultrasound and is successful in treating frozen shoulder.6

Gui Do Moon, MSc, PT, et.al, in 2015 For FS patients’ discomfort or ROM improvement, the MM and KM groups did not significantly vary from one another (p >0.05). This study shows less evidence regarding the range of motion. They have explained only about the Internal and External rotation. Study for all the motion has to be done. In our study Range of motion difference between the groups ah clearly explained with the statistical reference which shows that Maitland mobilization technique shows greater effects in all motion than that of Exercises.10

In the latest study conducted by Krupa M. Soni, et.al, in 2021 the research study indicated that women were more actively involved than men. The study suggests that tightness in distinct capsular segments may be restricting motion in more than one plane at once. A larger sample size and other outcome measures can be used for the same research. Thus the study discovered five distinct patterns of restriction as opposed to a single pattern of capsular restriction. Measured by passively performing ROM using goniometer.17

SY Lee et.al in 2015 suggested that A reduction in shoulder range of motion, notably in the abduction and external rotation directions, was significantly correlated with glenohumeral joint capsular stiffness, even though there were no relevant correlations with shoulder pain while performing or at rest. In the current study, between shoulder ROM limits and in vivo assessed capsular stiffness are for the first time made public. The correlations between shoulder ROM limits as indicated by the goniometer in the ACS and the quantitatively calculated in vivo Kcap have never been examined before, but they are in this work.18

Conclusion

This study found that the Maitland Mobilization technique as well as Exercise both seem to be effective in treating adhesive capsulitis. But the patients in Maitland Group show greater improvement than the exercise group. Hence this study concluded that the Maitland mobilization Technique found to be effective when compared with exercise in improving Range of motion and reducing shoulder pain and disability of shoulder in Adhesive Capsulitis.

Ethical Clearance: The ISRB committee of a private hospital and institution in Chennai has provided its clearance for the conduct of human research that complies with all applicable national laws, and institutional regulations. (Application Number-03/079/2022/ISRB/SR/SCPT).

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References


