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Effectiveness of Maitland Mobilization Technique in the Treatment of Adhesive Capsulitis: Systematic Review

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ABSTRACT

Background: Frozen shoulder, also known as adhesive capsulitis, is a condition that involves a gradual and painful loss of movement of the shoulder joint, both when actively moving the joint and when having it moved by someone else. Adhesive capsulitis occurs because the joint capsule becomes increasingly fibrous and eventually contracts, decreasing the range of motion. Primary Adhesive Capsulitis is an idiopathic process that causes widespread capsular fibrosis and inflammation in the absence of other lesions. Adhesive capsulitis that appears after a specific cause, risk factor, or surgical procedure is called secondary adhesive capsulitis. Maitland mobilization is utilized to improve the range of motion and treat adhesive capsulitis. During the treatment, the therapist delivers glides at 2 to 3 glides per second for one minute, followed by a 30-second rest period.

Aim: This research aims to conduct an all-inclusive examination of the literature to assess the effectiveness of the Maitland mobilization technique for treating adhesive capsulitis of the shoulder.

Methods: PubMed, Google Scholar, and MEDLINE were used for the studies conducted between 2013 – 2023. Literature reviews and Randomized control trials were included that investigate the effectiveness of the Maitland mobilization technique in frozen shoulder.

Results: Maitland mobilization showed improved results in VAS, SPADI, and ROM in the patients when used with conventional physiotherapy treatment.

Conclusion: After conducting a systematic analysis, it was concluded that the addition of Maitland to conventional physiotherapy treatment produces better outcomes in patients with shoulder adhesive capsulitis by improving the range of motion and reducing VAS and SPADI scores.

Keywords: Adhesive Capsulitis, Frozen shoulder, Maitland mobilization, Shoulder joint mobilization.

INTRODUCTION

Adhesive capsulitis also known as frozen shoulder, is characterized by a painful, progressive loss of both active and passive glenohumeral range of motion as a result of progressive fibrosis and eventual contracture of the glenohumeral joint capsule. (1)

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Between 2% and 5% of people have it, and most patients are women. The non-dominant hand is more frequently affected by adhesive capsulitis, and it is more prevalent in people in their fifth and sixth decades of life. Prevalence in the diabetic population is reported to be 11%. [2]

Genetic and environmental factors both play a significant part in the complex and multifactorial etiology of frozen shoulder.

Primary Adhesive Capsulitis is an idiopathic process that causes widespread capsular fibrosis and inflammation in the absence of other lesions. Secondary adhesive capsulitis occurs due to a known cause, risk factor, or surgical occurrence. Various predisposing factors can cause a secondary frozen shoulder. Secondary capsular contracture can be mistaken for Primary (idiopathic) adhesive capsulitis but is differentiated by the presence of co-occurring injuries or illnesses. Patients describe an insidious onset, progressive pain worsening, and progressive reduction in the active and passive range of motion. Loss of external rotation, abduction, and flexion are the main presenting factors. [2,3]

The patient is educated about the condition and its stages as part of the physiotherapy interventions. It is crucial to inform patients that while the condition will eventually resolve on its own and stiffness will significantly lessen over time, the full range of motion might never return. Early stages can be treated with electrotherapy and cold packs. Stage 1 is the best time to begin Codman's pendulum exercise, active assisted range of motion exercises, and capsular stretching. Since the muscles are weak from lack of use, gentle shoulder joint mobilization, and isometric exercises should be started in the second stage. The third stage of rotator cuff strengthening involves starting with a half kg weight and gradually progressing to a full kg weight. According to Maitland's concept of manipulative physiotherapy, oscillatory movement within a range that is considered safe for the joint. Grade 1 and 2 Maitland mobilization techniques are mainly used to alleviate pain, while Grade 3 and 4 techniques are primarily intended to stretch the joint to increase its range of motion. [2-4]

Maitland mobilization is applied to treat adhesive capsulitis by increasing the range of motion of the joint. For one minute, the glides are delivered at 2 to 3 glides/second, followed by a rest of 30 seconds in between. Glenohumeral caudal glide is provided to improve the range of motion of shoulder abduction, anterior glide is administered to improve the range of motion of shoulder extension and external rotation, and posterior glide is provided to improve the range of motion for shoulder flexion. [3,4]

The connective tissue's length may be impacted by Maitland grades III and IV due to plastic deformation. The connective tissue required to achieve lengthening is damaged in a way that can be described as "therapeutic damage". As a result, due to the gradual loading, some of the individual collagen fibers and bundles become physically disconnected. The shortened and contracted soft tissues can be stretched using this technique, restoring the shoulder's normal physiological movements. [5]

Small amplitude oscillatory and distraction movements, which stimulate the mechanoreceptors and the proprioceptors, may be the cause of the pain relief in Maitland's group. By repeatedly stimulating mechanoreceptors, manipulation of the oscillation causes an inhibitory effect on the perception of painful stimuli. [5]

MATERIALS AND METHODS

Literature search platform

PubMed, Google Scholar, and MEDLINE, databases were accessed systematically using the following keywords: ‘Maitland Mobilizations’, ‘Joint Mobilizations’,

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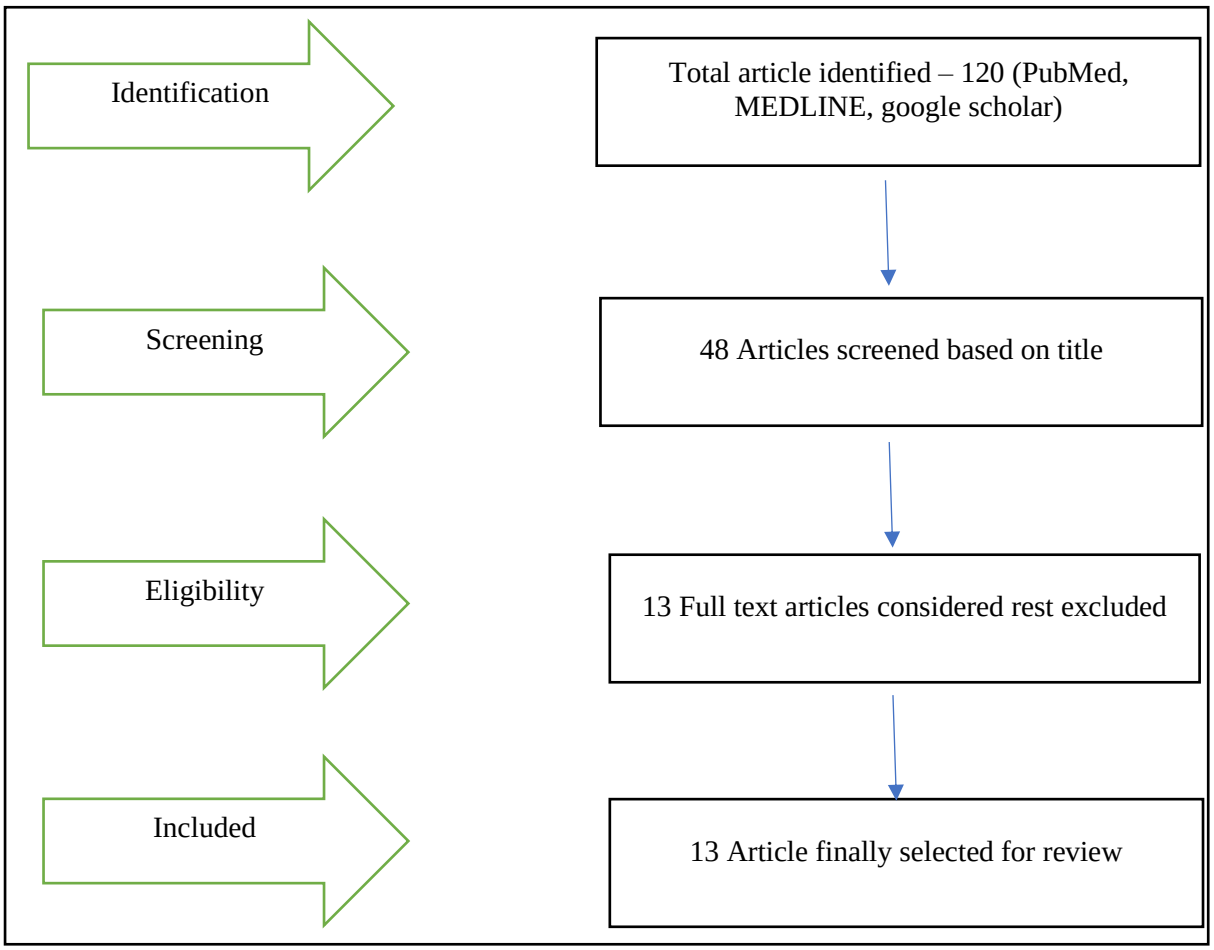
'Adhesive Capsulitis', and 'Frozen Shoulder'.

Inclusion and Exclusion criteria

The inclusion criteria considered for the present study were: (a) Those articles in which the following keywords are used: Adhesive Capsulitis, Frozen shoulder, Maitland mobilization, Shoulder joint mobilization, (b) The search was restricted from the years 2013-2023 (c) Articles published in the English language. Literature reviews and studies that only had abstracts available were excluded.

Data Extraction and Analysis

Firstly, the title and abstract of each retrieved record were assessed to determine their eligibility. The full-text articles were then examined to determine if they were appropriate for the study. In the second phase, all studies that passed the initial screening were reviewed by reading their full-text articles. After this double-screening process, 13 studies were considered suitable for inclusion in this review. [Table/Fig-2].



[Table/figure – 2]: The process of selection of studies

Description of Included Studies

After screening the full-text articles twice, 13 studies were selected for review. A summary of the included articles is provided below. [Table/Fig-3].

AUTHOR	TITLE	SUBJECT	DESIGN	OUTCOME MEASURES	CONCLUSION
Ramadan et al., (2022) [6]	Effect of Reflexology and Maitland Mobilization in Treatment of Frozen Shoulder of Diabetic Patients Type II.	N = 30 Group A -Maitland mobilization Group B - Reflexology	RCT	SPADI, VAS, Goniometry	The group of patients who received Maitland mobilization treatment demonstrated better outcomes than those who received reflexology treatment.".
Jivani et al., (2021)[7]	Effect of Spencer Muscle Energy Technique Versus Maitland's Mobilization Technique on Pain, ROM, and Disability in Patients with frozen Shoulders.	N = 58 3 groups were made, SPENCER MET, Conventional physiotherapy, and Maitland mobilization+ conventional physiotherapy	RCT's	VAS, SPADI, goniometry	Spencer MET is more effective for improving pain, reducing disability, and increasing ROM compared to Maitland mobilization in patients with adhesive capsulitis.
Jeyakumar S et al., (2018)[8]	The effects of Maitland Technique and Mulligan Technique in Adhesive capsulitis of the shoulder.	N = 105 Group A- mulligan and range of motion exercises, Group B – Maitland and range of motion exercises, Group C – received only range of motion exercises	RCT	VAS, SPADI, goniometry	Maitland technique and Mulligan technique both provide good improvement to the usual usage of physiotherapy; both techniques are effective in reducing pain and improving the ROM.

Agrawal et al., (2018)[9]	Effects of Maitland Mobilization with Conventional Physiotherapy in Adhesive Capsulitis.	N = 30, conventional therapy group A and Maitland therapy group B.	RCT	NPRS, SPADI, and ROM of the shoulder	There is a more significant increase in ROM, and SPADI score and a significant decrease in pain on NPRS by Maitland mobilization therapy along with conventional physiotherapy treatment as compared to conventional physiotherapy alone.
Biswas et al., (2018)[10]	effectiveness of Maitland mobilization versus Mulligan mobilization with the common intervention of ultrasound therapy in patients with shoulder adhesive capsulitis.	N = 30 Group A was given the Maitland mobilization technique with ultrasound therapy and Group B was given mulligan mobilization with ultrasound therapy.	RCT	SPADI, VAS, Goniometry	Mulligan mobilization with ultrasound is a superior treatment approach compared to the Maitland mobilization with ultrasound therapy in managing Adhesive Capsulitis.

Shehri et al., (2018)[11]	Efficacy of Maitland mobilization, in frozen shoulder.	N = 40. Group A was given Maitland technique along with Exercises Group B was given ultrasound therapy along with Exercises	RCT	SPADI, VAS, Goniometry	It was concluded that more improvement was shown by Maitland's group than by the Ultrasound group.
Kumar et al., (2017)[12]	Effectiveness of Laser Therapy and G.D Maitland Mobilization in Adhesive Capsulitis	N = 30 were Group A – GD Maitland Mobilization Group B - LASER therapy group.	RCT	VAS, SPADI, goniometry	Maitland is more effective than Laser therapy.
Phukon et al., (2017)[13]	Efficacy of Maitland mobilization and Muscle Energy Techniques in stage II shoulder adhesive capsulitis.	N=30 Group A - Maitland Technique and Group B –METS	Quasi-Experimental study	VAS, SPADI, goniometry	Group A which received Maitland Mobilization showed better and more positive results.

Moon et al., (2015)[14]	Comparison of Maitland and Kaltenborn mobilization techniques for improving shoulder pain and ROM in frozen shoulders.	N = 20 Group A received Maitland and Group B Kaltenborn mobilization to the affected shoulder.	RCT	VAS, SPADI, goniometry	The conclusion came out that Maitland and Kaltenborn mobilization techniques, both are effective for improving pain and ROM in frozen shoulder patients.
Haider et al., (2014)[15]	Effects of Maitland and Mulligan's mobilization techniques in the treatment of the frozen shoulder.	30 patients. In Group – A, patients were treated with mulligan, and in Group – B with Maitland.	RCT	VAS, SPADI, goniometry	Mulligan mobilization came out to be more effective in treating frozen shoulder than Maitland.
Deshmukh et al., (2014)[16]	Effectiveness of soft tissue mobilization preceding joint mobilization Technique in the management of Adhesive Capsulitis.	N = 30 Control Group is given Maitland's mobilization + Exercises, Experimental Group is given MFR Arm pull + Maitland's mobilization + Exercises	RCT	VAS, SPADI, goniometry	The myofascial release technique when given before Maitland's mobilization showed better results in reducing symptoms.

Shah et al., (2013)[17]	Effect of Maitland Technique (Posterior Glide), with Muscle Energy Technique for subscapularis muscle on adhesive capsulitis	40 subjects s were given the Maitland Technique (posterior glide) along with MET for subscapularis with conventional treatment.	Experimental study	VAS, SPADI, goniometry	Maitland technique along with MET for subscapularis is more effective in the treatment of frozen shoulder than conventional Treatment alone.

[Table/figure – 3]: Summary of included studies in the present review

DISCUSSION

Adhesive Capsulitis/ frozen shoulder, is a pathology that can cause significant, months-long restrictions in the shoulder joint range of motion. [18-21] Therefore, it is crucial that the most effective interventions be put into place for the patient to quickly return to their previous level of function. Due to their capacity to target both periarticular tissue and the joint capsule, joint mobilizations are a common physical therapy intervention used in this population. [22-24] The connective tissue's length may be impacted by Maitland grades III and IV due to plastic deformation. The connective tissue required to achieve lengthening is damaged in a way that can be described as "therapeutic damage" as a result. Due to the gradual loading, some of the individual collagen fibers and bundles become physically disconnected. The shortened and contracted soft tissues can be stretched using this technique, restoring the shoulder's normal physiological movements. The corrective glide to achieve ideal alignment of the articular surfaces and its maintenance by appropriate recruitment of the muscles by the patient's active efforts can be credited for the improvement in the Mulligan group. [25]

This systematic analysis's goal was to identify the best joint mobilization method for the management of adhesive capsulitis in terms of improving range of motion (ROM), lowering VAS, and improving the SPADI score. As the outcome measure, VAS, SPADI, and goniometry were used in the most of studies. The present study is based on literature that has been published within the last ten years. Through the data that was gathered, a systematic review was conducted to highlight the benefits of incorporating mobilization into conventional physiotherapy treatment as well as other electrotherapy modalities to effectively manage adhesive capsulitis. In the study conducted, it was found that most of the articles place a significant emphasis on Maitland's mobilization for patients suffering from adhesive capsulitis, along with conventional physiotherapy treatment. However, it was observed that Mulligan's technique yields better long-term outcomes compared to Maitland's technique. [26,27]

LIMITATION(S)

The studies included in this review were limited to those published only in the English language, which may have resulted

in the exclusion of relevant studies conducted in other languages. The generalizability of the findings to other populations or settings may be limited due to the variety of populations and settings in which all the included studies were conducted.

CONCLUSION

Based on the findings of this analysis, it was concluded that Maitland, when included with conventional physiotherapy treatment, shows better results in improving shoulder ROM, and decreased VAS and SPADI scores in patients with Adhesive capsulitis than conventional physiotherapy alone. Studies showed that other techniques like MET, capsular stretching, and electrotherapy modalities along with mobilization showed great improvement in pain scores. Mulligan mobilization was found to provide a long-term benefit in terms of pain reduction and improvement in ROM when compared to a treatment protocol consisting of Maitland mobilization. However, both interventions (Maitland and Mulligan) appear to have a positive effect in reducing pain and increasing the range of motion of shoulder joint.

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CONFLICT OF INTEREST – Nil.

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