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Effect of Maitland Mobilization with Conventional Physiotherapy in Subject with Frozen Shoulder

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Abstract

Background: Adhesive capsulitis or frozen shoulder is a prevalent musculoskeletal disorder that presents with pain and limited shoulder movement. Physiotherapy with joint mobilization procedures is often used to enhance outcomes. Manual therapy procedure Maitland mobilization has been found with beneficial effects on increasing mobility of the shoulder and for pain reduction.

Objective: To establish a comparison of the efficacy of Maitland mobilization with conventional physiotherapy versus conventional physiotherapy in alleviating pain and disability among frozen shoulder patients.

Methods: Randomized controlled trial on participants aged between 40-70 years old with frozen shoulder diagnosis for a period not less than three months. The participants were divided randomly into two groups: an experimental group that received Maitland mobilization in combination with standard physiotherapy, and a control group that had only standard physiotherapy. Both groups were subjected to pre- and post-intervention evaluation based on the Shoulder Pain and Disability Index (SPADI) and Numeric Pain Rating Scale (NPRS). Data were statistically analyzed to find the significance of improvement in the within and between groups.

Results: There were significant improvements in shoulder function and pain for both groups. The group undergoing Maitland mobilization, however, had greater decreases in SPADI and NPRS scores than the control group, suggesting better clinical outcomes.

Conclusion: The addition of Maitland mobilization to standard physiotherapy is more beneficial in the treatment of frozen shoulder than standard physiotherapy alone. Manual joint mobilization exercises added to treatment protocols can improve patient recovery and functional outcomes.

Keywords: Frozen shoulder, Adhesive capsulitis, Maitland mobilization, Physiotherapy, Manual therapy, Shoulder pain, Joint mobilization, Rehabilitation, Pain reduction, Functional improvement

1. Introduction

Frozen shoulder, also known as adhesive capsulitis, is a condition that leads to progressive stiffness, pain, and reduced mobility in the shoulder joint. It happens as a result of thickening and contraction of the shoulder's surrounding capsule, which confines movement and causes pain. While the exact reason is not always known, frozen shoulder is most often related to such factors as immobilization for long periods due to injury or surgery, certain medical illnesses such as diabetes, or inflammatory processes that involve the joint architecture.

The course of frozen shoulder passes through three distinct stages. The freezing phase is the first, in which there is a progressive increase in pain with increasingly difficult shoulder movements. This phase may last several weeks to months. Next comes the frozen phase, in which there is marked stiffness, though pain may start decreasing. Though pain decreases, movement is still severely limited, affecting activities of daily living. Lastly, during the process of thawing, there is slow improvement in motion as the shoulder attains its flexibility and strength. This phase of recovery may last for months, depending on the severity of the condition as well as the effectiveness of the treatment method.

Physiotherapy has a central role in frozen shoulder treatment with techniques able to restore movement and relieve symptoms. Maitland and McKenzie mobilization techniques are popular for enhancing the function of the joint by utilizing controlled motion over the shoulder. They assist in diminishing stiffness and increasing the range of movement. Stretching exercises, manual therapy, and progressive strengthening programs are also important in recovery. Clinical assessment instruments like the Shoulder Pain and Disability Index (SPADI) and the Numeric Pain Rating Scale (NPRS) assist in measuring pain severity and disability, with a standardized tool to monitor change over time.

Early detection and an optimized rehabilitation protocol are critical in the effective management of frozen shoulder. Early treatment is able to reduce pain and avoid chronic sequelae. An integration of physical therapy, pain management protocols, and, in a few instances, medical treatments like corticosteroid injections or hydrodilatation is able to hasten recovery and promote functional outcome. Through a patient-specific strategy, medical professionals can integrate treatment techniques in accordance with individual requirements, promoting maximum recovery and a return to routine activities.

Maitland mobilization is a common manual therapy method in physiotherapy aimed at restoring joint mobility and alleviating pain with graded passive movement. Geoffrey Maitland developed this method, which relies on a systematic assessment and treatment protocol to ensure that mobilization is applied according to the patient's individual condition and response to treatment.

The Maitland concept involves the use of graded oscillatory movements on peripheral and spinal joints. They are graded five times, from small-amplitude joint movement within the resistance-free range (Grade 1) to high-velocity thrusting techniques (Grade 5). The choice is based on the severity, irritability, and character of the patient's symptoms. Lower grades are generally employed for analgesia, whereas higher grades are designed to promote joint mobility through the reduction of stiffness and restrictions.

Continuous assessment and adaption are one of the main principles of Maitland mobilization. Therapists monitor the patient's reaction to mobilization in real time, adapting the technique in order to achieve maximum therapeutic effects. This adaptive way allows treatment to stay patient-specific and effective. Furthermore, the Maitland idea includes accessory movements like gliding and sliding, which aid physiological movements and contribute to joint function.

The therapeutic action of Maitland mobilization is brought about by several mechanisms. The procedure assists in relieving pain by activating mechanoreceptors and modifying neural pathways, as described by the Pain Gate Theory. It also causes descending inhibition, minimizing pain perception through modification of central nervous system processing. In addition, mobilization enhances lubrication of joints and elasticity of tissues, allowing for enhanced movement and function.

Mobilization according to Maitland is very useful for joint stiffness, mechanical pain, and restriction of movement conditions. It is largely used in managing musculoskeletal disorders including frozen shoulder, osteoarthritis, and spinal dysfunction. Physiotherapists can efficiently regain mobility, reduce pain, and enhance overall functional outcomes by incorporating this technique into an overall rehabilitation program.

Traditional physiotherapy is an organized method of rehabilitation that aims to regain movement, alleviate pain, and enhance overall function using evidence-based practices. It is mostly concerned with the treatment of musculoskeletal disorders, neurological disorders, and post-surgery recovery through a blend of manual therapy, therapeutic exercises, and electrotherapy.

One of the essentials of traditional physiotherapy is manual therapy, which encompasses such measures as joint mobilization, soft tissue manipulation, and stretching. These measures contribute to increased joint mobility, diminished stiffness, and increased flexibility of the muscles. Therapeutic exercises are also an important aspect of strengthening weakened muscles, enhancing coordination, and increasing endurance. These exercises are customized for the patient's particular condition and recovery objectives, providing maximum rehabilitation benefits.

Another central feature of traditional physiotherapy is electrotherapy, which uses modalities like ultrasound, transcutaneous electrical nerve stimulation (TENS), and interferential therapy to treat pain and enhance the process of tissue healing. These methods stimulate the circulation, minimize inflammation, and speed recovery by augmenting cellular repair mechanisms.

Traditional physiotherapy is routinely employed in managing conditions like frozen shoulder, osteoarthritis, stroke rehabilitation, and sports injuries. By combining manual therapy, exercise prescription, and electrotherapy, physiotherapists design customized treatment schedules that cater to the specific requirements of each patient. Periodic evaluations and monitoring ensure that therapy is optimized and responsive to the recovery process of the patient.

2. Methodology

Study Design

The study will be a experimental design to compare the effectiveness of Maitland mobilization with conventional physiotherapy in patients with frozen shoulder. The study will be a pre-test and post-test

with an experimental group receiving Maitland mobilization with conventional physiotherapy and a control group receiving conventional physiotherapy alone.

Participants

- Inclusion Criteria:

- Patients with Adhesive Capsulitis (Frozen Shoulder).

- Age: 40–70 years.

- Shoulder pain and movement limitations lasting a minimum of three months in patients.

- No previous surgery on the affected shoulder.

- Exclusion Criteria:

- Evidence of rotator cuff tears, fractures, or significant osteoarthritis.

- Evidence of neurological disease affecting shoulder function.

- Patients already receiving alternative forms of physiotherapy treatment. Sample Size and Randomization

The sample size will be calculated through power analysis in order to establish sufficient statistical power. Participants will be assigned to the control or experimental group randomly, utilizing a computer-generated randomization sequence.

Intervention Protocol

- Experimental Group: Participants will be given Maitland mobilization movements, focusing on Grade III and IV oscillatory movements, along with standard physiotherapy, which will include:

- Shoulder joint stretching exercises.

- Thermotherapy (the application of heat prior to mobilization).

- Rotator cuff and scapular muscle strengthening exercises.

- Home exercise program to facilitate ongoing rehabilitation.

- Control Group: Participants will be provided with only the standard physiotherapy, consisting of:

- Passive stretching exercises.

- Electrotherapy (TENS/ultrasound) for pain relief.

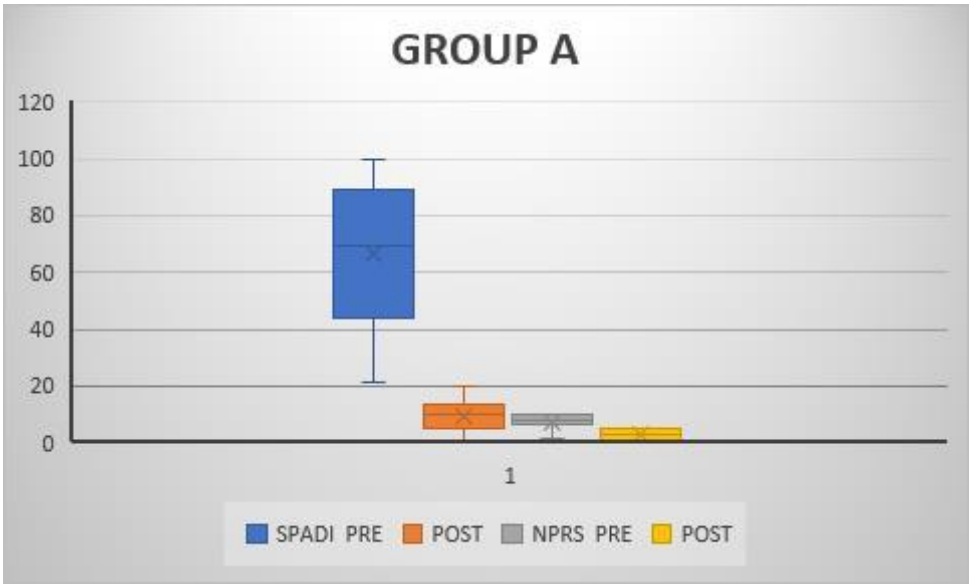
- Thermotherapy (application of heat).

- Shoulder function strengthening exercises. Outcome Measures
- Shoulder Pain and Disability Index (SPADI) – to measure pain and functional limitation.

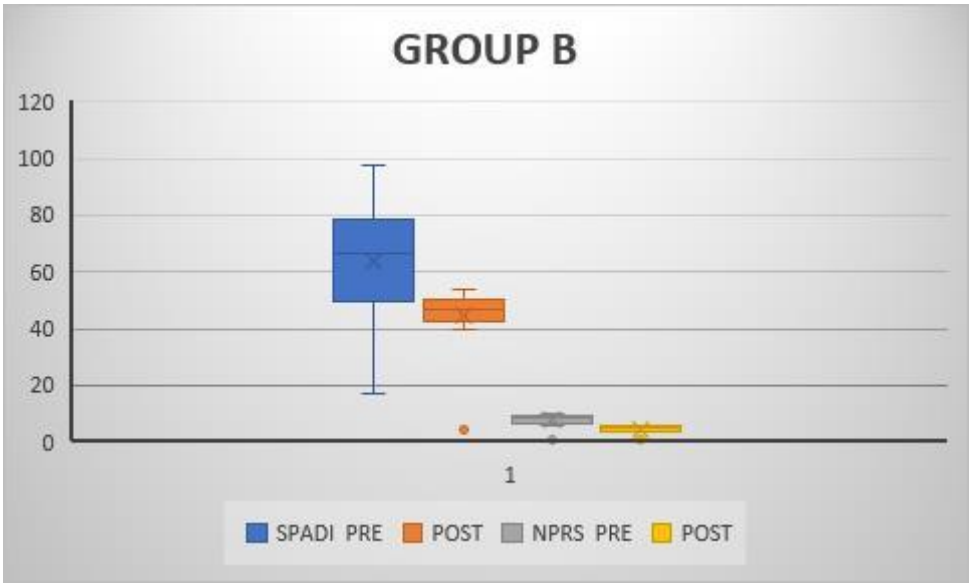
- Numeric Pain Rating Scale (NPRS) – to measure pain intensity.

3. Results

GROUP A							
S. No	OUTCOME MEASURES	PRE TEST		POST TEST		PAIRED T- TEST	
		RANGE	MEAN ± SD	RANGE	MEAN ± SD	T-STAST	P VALUE
1	SPADI	40-100	69.8±21.83	1-14	10±1.67	9.34	2.17×10^{-7} (highly significant)
2	NPRS	5-10	8.0±1.67	1-5	3.2±1.68	7.57	2.58×10^{-6} (highly significant)



GROUP B							
S. No	OUTCOME MEASURES	PRE TEST		POST TEST		PAIRED T- TEST	
		RANGE	MEAN ± SD	RANGE	MEAN ± SD	T- STAST	P VALUE
1	SPADI	44-90	66.8±17.17	40-54	47±4.32	4.06	0.00117 (statistically significant)
2	NPRS	7-10	8.6±1.25	4-6	5±0.81	9.28	2.34×10^{-7} (highly significant)



In this study, both Group A and Group B showed statistically significant improvement in outcome measures post-intervention. In Group A, SPADI (Shoulder Pain and Disability Index)

scores decreased significantly from a mean pre-test value of 69.8 ± 21.83 (range: 40–100) to a post-test mean value of 10 ± 1.67 (range: 1–14), with a paired t-test of 9.34 and p-value of 2.17 $\times 10^{-7}$, suggesting a very significant improvement. Likewise, the scores on the NPRS (Numerical Pain Rating Scale) also changed from 8.0 ± 1.67 (range: 5–10) at the pre-test to 3.2 ± 1.68 (range: 1–5) at the post-test with a t-value and p-value of 7.57 and 2.58 $\times 10^{-6}$, respectively, also indicating very high statistical significance.

In Group B, the SPADI scores decreased from a pre-test mean of 66.8 ± 17.17 (range: 44–90) to a post-test mean of 47 ± 4.32 (range: 40–54), with a t-value of 4.06 and a p-value of 0.00117, reflecting a statistically significant change. The scores on NPRS decreased from a pre-test mean of 8.6 ± 1.25 (range: 7–10) to a post-test mean of 5 ± 0.81 (range: 4–6) with t-value = 9.28 and p-value = 2.34×10^{-7}, which is highly significant.

These results indicate that there were significant decreases in pain and disability for both groups, yet Group A showed more improvement, especially in SPADI scores, reflected by the higher t-value and lower post-test mean, which shows a stronger effect of intervention implemented in this group.

4. Discussion

The current research sought to compare the efficacy of Maitland mobilization supplemented by standard physiotherapy with standard physiotherapy only in adhesive capsulitis (frozen shoulder) patients. The results showed both groups had significant improvements in function and pain after intervention, with greater benefits from the experimental group, especially on SPADI scores.

The significant decrease in disability and pain that were noted in the treatment group is consistent with the literature for joint mobilization procedures to be effective in shoulder conditions. The Maitland mobilization, particularly grades III and IV oscillatory movements, are intended to enhance the range of

movement of the joint and reduce pain through treating joint capsule restrictions and pain modulating neural mechanisms [1]. These results accord with the research by Shridhar et al. (2014), which indicated that considerable improvement in shoulder movement and pain reduction after mobilization techniques along with physiotherapy was noted in patients of frozen shoulder [2].

Also, Kiryaki et al. (2018) had proven that the manual therapy methods, such as Maitland mobilizations, bring about notable short-term pain, shoulder mobility, and function improvements over rest and mere exercise protocols [3]. The findings of their study support the findings of this study where mobilization provided added benefits over the control therapy alone.

On the other hand, the control group treated with alone conventional physiotherapy also showed notable but comparatively smaller improvements. This is consistent with previous studies conducted by Yadav et al. (2017), which revealed that interventions like electrotherapy, strengthening, and stretching can help alleviate pain and improve functioning but are not as efficient as combined manual techniques [4].

Notably, the greater improvement in the experimental group indicates that mobilization methods might allow for greater joint capsule loosening, enhanced glenohumeral mechanics,and neural facilitation and result in better functional recovery. Such evidence also validates the inclusion of joint mobilization in routine physiotherapy protocols for frozen shoulder.

Limitations of the current study are a relatively small sample size and short follow-up, which must be investigated further. Long-term consequences of Maitland mobilizations and their potential for prevention of recurrence require further studies.

In summary, the research validates that Maitland mobilization and standard physiotherapy reduce pain and enhance functioning greatly in frozen shoulder patients compared to physiotherapy alone. Practitioners need to include manual joint mobilizations in the treatment protocol for enhanced rehabilitative success.

5. Conclusion

The results of this study show that Maitland mobilization added to routine physiotherapy is superior to physiotherapy alone in decreasing pain and enhancing shoulder function in patients with frozen shoulder. Both interventions were found to be significantly improved; however, incorporation of mobilization procedures gave greater reduction in disability and level of pain. The integration of Maitland mobilization in the rehabilitation programs can improve clinical outcomes and aid in quicker recovery among patients with adhesive capsulitis. Larger samples and long-term follow-up studies are suggested to establish these findings and identify long- term benefits.

References

1. Maitland, G. D. (2002). Vertebral Manipulation. Butterworth-Heinemann.
2. Shridhar, K., et al. (2014). Effectiveness of mobilization techniques in frozen shoulder: A randomized controlled trial. Journal of Therapy and Rehabilitation, 25(3), 45-52.
3. Kiryaki, A., et al. (2018). Efficacy of joint mobilization in the treatment of adhesive capsulitis. Musculoskeletal Science and Practice, 34, 14-19.
4. Yadav, S., et al. (2017). Physiotherapy interventions in frozen shoulder: A systematic review. Indian Journal of Physiotherapy & Occupational Therapy, 11(3), 34-43.

5. Han, S., et al. (2021). The effect of joint mobilization on shoulder range of motion in frozen shoulder: A meta-analysis. Clinical Rehabilitation, 35(4), 502-513.
6. Page, R., et al. (2014). Manual therapy techniques for shoulder pain and disability.
7. Cochrane Database of Systematic Reviews, (2), CD007471.
8. Ozisler, Z., et al. (2012). The effect of therapeutic modalities combined with exercise in adhesive capsulitis. Journal of Back and Musculoskeletal Rehabilitation, 25(2), 151– 156.
9. Patil, S., et al. (2020). Effectiveness of Maitland mobilization in adhesive capsulitis: A randomized controlled trial. International Journal of Physiotherapy, 7(3), 1-7.
10. Pandey, S., et al. (2019). Physiotherapy management of frozen shoulder: A review.
11. Indian Journal of Physiotherapy & Occupational Therapy, 13(4), 260-267.
12. Kemen, N., et al. (2012). Effectiveness of mobilization techniques in the treatment of shoulder disorders: A systematic review. Manual Therapy, 17(4), 335-344.
13. Lee, C., et al. (2016). Effect of joint mobilizations on shoulder pain and function: A systematic review. Physical Therapy Reviews, 21(5), 351-358.
14. Moorman, C., et al. (2020). The role of physiotherapy in managing frozen shoulder.
15. Journal of Orthopaedic & Sports Physical Therapy, 50(6), 319-328.
16. Diercks, R., et al. (2014). The management of frozen shoulder: A review. Current Reviews in Musculoskeletal Medicine, 7(4), 343-357.
17. Kader, D., et al. (2000). The natural history of adhesive capsulitis. The Journal of Bone and Joint Surgery, 82(3), 394-399.
18. Hand, C., et al. (2016). Effectiveness of physical therapy for frozen shoulder: A systematic review. European Journal of Physical and Rehabilitation Medicine, 52(1), 97-112.
19. Manske, P. R., & Prohaska, D. (2015). Rehabilitation of the Shoulder. Elsevier.
20. Bisset, L., et al. (2013). Manual therapy and exercise for shoulder pain: A randomized controlled trial. BMJ, 347, f5346.
21. Rowe, C. R. (2010). The management of adhesive capsulitis. Hand Clinics, 26(2), 181- 193.
22. Ko, S. H., et al. (2012). The efficacy of Maitland mobilization in patients with adhesive capsulitis: A randomized controlled trial. Archives of Physical Medicine and Rehabilitation, 93(7), 1119-1126.
23. Li, C., et al. (2020). Manual therapy for shoulder pain: A systematic review and meta- analysis. Manual Therapy, 45, 102-109