

Available online on 15 Dec, 2024 at <http://www.hjhs.co.in/index.php/hjhs>

Himalayan Journal of Health Sciences

Published by Himalayan Group of Professional Institutions

Associated with Himalayan Institute of Pharmacy

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Review Article

Open Access

Recent Advances in Physiotherapy Treatment Techniques for Frozen shoulder-A Narrative Review

Nandini^{*a}, Smruti Swagatika Dash^b, Rajendra Kachhwaha^c^aMPT (First year), Narayana Hrudayalaya Institute of Physiotherapy, Bangalore-560 099, India.^bProfessor, Narayana Hrudayalaya Institute of Physiotherapy, Bangalore-560 099, India.^cPrincipal, Narayana Hrudayalaya Institute of Physiotherapy, Bangalore-560 099, India.

Abstract

Background: Frozen shoulder is a condition that is characterized by pain, decrease in range of motion, stiffness in shoulder joint. It also leads to restriction of daily living activities. Frozen shoulder is reported to affect 2% to 5% of the general population. It affects mostly age group of 30 to 60 years. In frozen shoulder, capsule become hard, thick and tight and there is loss of axillary pouch and joint volume which leads to lack of motion of shoulder joint. Shoulder capsule get thick with mild chronic inflammation and fibrosis along with infiltrate.

Recent advancements in physiotherapy, including techniques like movement with mobilization, matrix rhythm therapy, sleeper's stretch, gongs mobilization, and myofascial release, show promise in improving outcomes. However, there is a lack of comprehensive research comparing the effectiveness of these modern physiotherapy approaches. This study aims to address this gap by evaluating and identifying the most effective treatments for managing frozen shoulder, thereby enhancing clinical practice and patient outcomes.

Conclusion: This study concluded that matrix rhythm therapy, Gong's mobilization and MWM techniques showed significant improvement in reducing pain, improving ROM and shoulder functions among patients with frozen shoulder

Keywords: Frozen shoulder, Range of motion, Advanced Physiotherapy interventions, Matrix rhythm therapy, MWM, Sleeper's stretch

Article Info: Received 20 Oct 2024; Review Completed 30 Nov 2024; Accepted 03 Dec 2024



Cite this article as:

Nandini, Dash SS, Kachhwaha R. Recent Advances in Physiotherapy Treatment Techniques for Frozen shoulder-A Narrative Review. Himalayan J H Sci [Internet]. 2024 Dec 15 [cited 2024 Dec 15]; 9(4):1-6. Available from: <http://www.hjhs.co.in/index.php/hjhs/article/view/214>

DOI: 10.22270/hjhs.v9i4.214

*Corresponding author

1. Introduction

Frozen shoulder, medically known as adhesive capsulitis, is a debilitating condition characterized by the thickening and contracting of the glenohumeral joint capsule over time. This leads to gradually worsening symptoms of pain and restricted shoulder mobility, ultimately affecting an individual's daily life. The condition typically follows an insidious onset, where symptoms develop slowly but can persist for months to years, often disrupting sleep and making simple tasks like dressing or combing hair challenging. (1)

Patients with frozen shoulder experience an array of symptoms, with pain and the progressive loss of active and passive range of motion being the most prominent. The condition typically evolves through four stages: the painful phase, freezing stage, frozen stage, and thawing stage, each characterized by distinct clinical features and durations. Loss of external rotation (ER) in a dependent position with the arm down by the side is one of the most common symptoms. Overhead activities like grooming,

above tasks, dressing, and especially securing objects behind the back are all the common difficulties for patients with frozen shoulder. This is thought to be a self-limiting condition, with reports of symptom relief ranging from 6 months to 11 years. (2)

Unfortunately, many patients' symptoms may never completely go away. Adhesive capsulitis, unlike more serious causes of shoulder pain, does not exhibit red flag symptoms like fever, night sweats, or unexplained weight loss. Diagnosing frozen shoulder primarily relies on clinical examination. Physicians assess a patient's range of motion and the presence of associated discomfort during specific movements. Radiological imaging, such as X-rays or MRI, may be recommended to rule out other conditions if needed, although it's typically not required for diagnosis. Frozen shoulder shares symptoms with various other shoulder pathologies, including rotator cuff injuries, calcifying tendinitis, and cervical radiculopathy, making its accurate diagnosis crucial.

Table 1. Type of study, Participants Details and study result

SL. NO	Type of study, Year & Participants Details	Group	Result
01	RCT, 2023 40-60years of age group patients were included. (4)	36 participants divided into two groups respectively conventional physiotherapy and matrix rhythm therapy.	The study showed significant statistical improvement in pain and disability reduction among subjects treated with MRT.
02	RCT, 2023 40-60years of age group patients were included. (5)	30 participants divided into two groups respectively conventional physiotherapy and matrix rhythm therapy.	The study shows that matrix rhythm therapy was promising treatment option for frozen shoulder offering significant improvements in pain, disability, and quality of life.
03	RCT, 2022 The study included idiopathic frozen shoulder patients of either sex aged 30 to 70 years, phases 1 and 2, or a stiff joint of an agonizing shoulder for a minimum of 3 months. (6)	40 participants divided into two groups. The first group received Spencer Muscle Energy Technique, and the second group received the conventional treatment procedure.	SMET was more effective in shoulder pain reduction, in which conventional treatment showed more effectiveness in enhancing the shoulder ROM.
04	A single blind randomized control trial, 2020 Patients of either gender aged 30-55 years with idiopathic frozen shoulder stage 1 and 2 or stiff painful shoulder joint for at least 3 months. (7)	Randomized into two equal groups Group 1 was exposed to spencer muscle energy technique, while group 2 was exposed to passive stretching.	Spencer technique was found to be more effective than passive stretching in treating patients with adhesive capsulitis.
05	RCT, 2023 Both gender, age of 50–60 years; (ii) unilateral frozen shoulder with pain lasting for more than 1 month; (iii) capsular pattern of motion restriction; and (iv) more than 50% loss of passive movement of the shoulder joint compared with the unaffected side. (8)	30 patients randomized into 2 groups of 15 with a simple random technique. Group 1 received Spencer technique along with conventional physiotherapy. Group 2 received Gong's mobilization technique along with conventional physiotherapy.	Gong's mobilization along with conventional physiotherapy was found to be more effective than Spencer technique in treating patients with Frozen Shoulder.
06	RCT, 2020 1. The participants willing to participate in the study. 2. Diagnosed by a clinician as periarthritis of shoulder. 3. Age between 40 – 70 years of both male and female. 4. Diagnosed with diabetic frozen shoulder. (9)	60 participants divided into two groups respectively Gongs mobilization and conventional physiotherapy.	Gongs mobilization along with conventional therapy is more effective in the treatment of frozen shoulder than the conventional therapy alone.
07	RCT, 2021 40-60years of age group of both gender patients were included. (10)	A total of 60 subjects randomly assigned into 2 groups, 30 members in group A (Gong's mobilization), 30 members in group B (Scapular and Glenohumeral mobilization).	Gong's mobilization has shown to be more effective when compared to Scapular and Glenohumeral mobilization in decreasing pain, increasing range of motion, and decreasing functional disability in subjects with periarthritis of the shoulder.

08	RCT, 2023 Both gender age group between 40-70 years, diagnosed by a clinician with adhesive capsulitis, bilateral adhesive capsulitis, diagnosed with diabetic adhesive capsulitis. (11)	30 subjects were randomly assigned into 2 groups. Group 1, Received Gong's Mobilization with conventional therapy, and Group 2, received Myofascial Release technique with traditional treatment.	The results of this study suggested that both the treatment methods, i.e. Gong's mobilization and myofascial release were effective in reducing pain and improving external rotation, abduction and flexion ROM and function in subjects with adhesive capsulitis.
09	RCT, 2022 Both gender between ages 40 to 60 years. All the subjects must have adhesive capsulitis for at least last three months. (12)	42 individuals with adhesive capsulitis were included and allocated to 2 groups (n=21). Groups were administrated with Muscle energy technique along with conventional therapy, Mobilization with Movement along with Conventional therapy.	The MWM (Group B) was associated with statistically significant greater change in ROM and SPADI score than MET (Group A) and. There was statistically significant change observed NPRS in both the groups: MWM along with Conventional therapy improves ROM of shoulder and functional disability in patients with Adhesive capsulitis.
10	RCT, 2018 Prediagnosed case of adhesive capsulitis, sub-acute and chronic stage, both male and female having at least 90 degree of shoulder abduction and elbow flexion. (13)	30 subjects with primary adhesive capsulitis with the age group of 40 - 65 years participated in the study. Patients in Group 1 received capsular stretch with conventional physiotherapy treatment whereas patients in Group 2 received Sleeper stretch in addition to conventional physiotherapy treatment.	Sleeper stretches with conventional therapy has shown to be more effective for improving pain, shoulder ROM and functions in Adhesive Capsulitis patients.
11	RCT, 2021 Age group of 40 to 60 years, subjects with limited range of motion in capsular pattern, VAS more than 4/10. (14)	30 subjects were randomly allocated into 2 groups of 15 each. Group A received Mulligan Mobilization with Movement and Group B received Kinesio-taping for shoulder joint.	Study concluded that Mulligan Mobilization with Movement is a better intervention on Frozen shoulder as it shows greater increase in shoulder range of motion and significant pain reduction when compared to Kinesio-taping technique.
12	RCT, 2020 Age group of 40 to 60 years, subjects with pain score (NPRS) more than 3 out of 10, limited ROM. (15)	36 participants were randomly divided into 3 groups. Group A: 14 patients received conventional physical therapy. Group B: Diclofenac phonophoresis was added three times per week for 11 patients. Group C: MWM technique was added twice per week for 11 patients.	MWM technique combined with conventional physical therapy program had the superiority in improving the shoulder ROM.
13	RCT, 2021 Both genders with age group between 40-65yrs were included. (16)	30 participants were randomly divided into 2 groups. Group 1 received MWM and group 2 received KT technique.	KT shows an adjunct effect on pain, range of motion and function when used along with mobilization techniques in patients with adhesive capsulitis of the shoulder.
14	RCT, 2022 Age group between 40 to 60 years, capsular pattern of movement limitation, and phase 2 patients with adhesive capsulitis. (17)	26 participants divided into 2 groups; group 1 received KT technique along with Maitland mobilization, group 2 received Maitland mobilization alone.	Two treatment technique used in this study was effective in treating adhesive capsulitis but Maitland technique alone is more effective in managing adhesive capsulitis.

Distinguishing between these conditions that can be challenging, underscoring is the importance of a thorough clinical evaluation.

Certain factors predispose individuals to frozen shoulder, with diabetes, thyroid disorders, and prior shoulder injuries or surgeries being notable risk factors. Frozen shoulder is more common in women and typically affects individuals aged 40 to 65, although it can occur in people of all genders and age groups. The prevalence in the general population ranges from 2% to 5%, but it can be as high as 10% to 20% in diabetic patients, making diabetes a significant risk factor. (3)

Physiotherapy for frozen shoulder focuses on improving shoulder mobility, reducing pain, and restoring function through manual therapy and exercises. Key techniques include: Stretching and Range of Motion Exercises (e.g., sleeper's stretch, pendulum exercises) to gradually increase flexibility. Mobilization with Movement (MWM) to address stiffness by applying manual force while the patient moves the arm. Myofascial Release (MFR) to reduce muscle tightness and promote relaxation. Matrix Rhythm Therapy (MRT) to stimulate tissue regeneration and reduce pain through mechanical vibrations. Glenohumeral Joint Mobilization to improve range of motion by targeting the joint capsule. While medical management (e.g., NSAIDs, corticosteroid injections) provides pain relief, physiotherapy offers a more comprehensive approach by addressing both the pain and underlying mobility issues, leading to better long-term outcomes. (4,5,6)

2. Objectives of the study

To study most effective recent advances for managing pain and disability in patients with frozen shoulder.

3. Methodology

There will be no limitation concerning sample size, age of patients, or study design. Studies published between 2018 and 2024 will be included. Studies will evaluate the effect of recent advanced technique in physiotherapy along with conventional therapy in patients with adhesive capsulitis.

Exclusion Criteria: Studies that are not relevant or involve other shoulder pathologies, articles published before 2018, studies not in the English language, studies with fewer than 10 patients in the intervention cohort, studies that do not involve clinical trials, and those that are not full-text articles will be excluded. Inclusion Criteria: Eligible studies must evaluate the effects of recent advanced physiotherapy techniques, in conjunction with conventional therapy, for patients with adhesive capsulitis. Only studies published between 2018 and 2024 will be considered. Additionally, only studies involving human subjects, written in English, and with an intervention cohort of more than 10 patients will be included. All included studies must be full-text articles.

4. Discussion

Frozen shoulder (adhesive capsulitis) is a condition where the shoulder capsule thickens and tightens, causing pain, stiffness, and limited mobility. It develops in three stages: freezing (pain and decreasing motion), frozen (stiffness),

and thawing (gradual recovery). Most commonly affecting people aged 40 to 65, especially women, it occurs in 2-5% of the general population but is more prevalent (10-20%) in diabetics. The exact cause is unclear, but inflammation in the joint capsule is believed to play a role. Treatment includes physical therapy, pain management, and sometimes injections or surgery. Recovery can take months, and while most people improve, some may have residual stiffness. (1)

MRT has been found to promote the relaxation of soft tissues and enhance joint function by improving muscle tone, increasing blood flow, and facilitating tissue repair. By targeting both the neural and muscular aspects of the shoulder, MRT helps in reducing the stiffness and inflammation that characterize frozen shoulder. This not only reduces pain but also restores mobility, leading to improved functionality and quality of life for patients. Both studies highlight Matrix Rhythm Therapy as an effective treatment for frozen shoulder, offering substantial benefits in pain relief, disability reduction, and improved quality of life. The therapy works by stimulating tissue repair, enhancing circulation, and relaxing muscles, which together help alleviate the symptoms of this debilitating condition. These findings support MRT as a promising alternative or adjunct to traditional treatment options for frozen shoulder, such as physical therapy and medication. (4,5)

Two studies on the treatment of frozen shoulder (adhesive capsulitis) highlight the effectiveness of the Spencer Technique (ST) and its comparison with other treatments. The first one found that Spencer Muscle Energy Technique (SMET) was more effective in reducing pain, while conventional treatments like passive stretching and strengthening exercises were better for improving range of motion (ROM) and another study concluded that the Spencer Technique was superior to passive stretching, showing greater improvements in both pain reduction and ROM. The Spencer Technique combines manual therapy techniques to address muscle imbalances and joint stiffness, making it more effective than passive stretching alone. A combination of SMET for pain relief and conventional treatments for ROM improvement could offer a comprehensive approach to managing frozen shoulder. (6,7)

A study found that Gong's mobilization, combined with conventional physiotherapy, was more effective than the Spencer technique in treating frozen shoulder. Similarly, one more research concluded that Gong's mobilization with conventional therapy yielded better outcomes than conventional therapy alone. A study demonstrated that Gong's mobilization was more effective than Scapular and Glenohumeral mobilization in reducing pain, improving range of motion, and decreasing functional disability in patients with shoulder periarthritis. Additionally, research suggested that both Gong's mobilization and myofascial release were effective in reducing pain and improving external rotation, abduction, flexion range of motion, and function in individuals with adhesive capsulitis. These studies collectively support the superiority of Gong's mobilization, particularly when combined with conventional therapy, for improving pain,

range of motion, and function in frozen shoulder patients. (8,9,10,11)

Several studies highlight the effectiveness of Mulligan's Mobilization with Movement (MWM) in treating adhesive capsulitis (frozen shoulder) compared to other techniques. A study found that MWM, combined with conventional therapy, led to significant improvements in shoulder range of motion (ROM) and the Shoulder Pain and Disability Index (SPADI) score, outperforming Muscle Energy Technique (MET) in both ROM and functional disability. Second study concluded that the Sleeper stretch, when combined with conventional therapy, was more effective for reducing pain and improving shoulder ROM and function in adhesive capsulitis patients. Similarly, one more study found that MWM was superior to Kinesio-taping in increasing shoulder ROM and significantly reducing pain, demonstrating its greater effectiveness in treating frozen shoulder. Fourth study confirmed that MWM, when paired with conventional physical therapy, was more effective in improving shoulder ROM than conventional therapy alone. These studies collectively support the superiority of MWM in improving ROM, reducing pain, and enhancing shoulder function in patients with adhesive capsulitis, making it a more effective intervention compared to techniques like MET, Kinesio-taping, or Sleeper stretch. (12,13,14,15)

A study found that Kinesio-taping (KT), when used as an adjunct to mobilization techniques, had a positive effect on pain, ROM, and shoulder function. KT supported the benefits of manual therapy by reducing pain and enhancing movement, suggesting that combining KT with mobilization techniques may provide a more comprehensive approach for managing adhesive capsulitis. Another study concluded that both techniques used in their study were effective in treating adhesive capsulitis, but the Maitland technique (a type of joint mobilization) was more effective when used alone. This suggests that Maitland mobilization directly targets joint stiffness and pain, leading to greater improvements in ROM and function compared to other methods. In conclusion, combining Kinesio-taping with mobilization techniques can enhance treatment outcomes for adhesive capsulitis, while Maitland technique alone may offer superior results in managing the condition due to its direct impact on joint mechanics and pain reduction. (16,17)

5. Conclusion

This study found that Matrix Rhythm Therapy (MRT), Gong's Mobilization, and Mobilization with Movement (MWM) were effective in treating frozen shoulder. These techniques significantly reduced pain, improved the range of motion (ROM), and enhanced shoulder function. MRT helped stimulate tissue regeneration and reduce inflammation, Gong's Mobilization addressed stiffness, and MWM improved joint mobility, leading to better long-term outcomes for patients.

Abbreviations:

FS-Frozen shoulder

ROM-Range of motion

KT-Kinesio taping

SMET-Spencer muscle energy technique

MRT-Matrix rhythm therapy

NPRS-Numerical pain rating scale

SPADI-Shoulder pain and disability index

RCT-Randomized controlled trial.

Acknowledgements

We would like to express our gratitude to Himalayan Journal of Health Sciences who gave us the opportunity to publish the article.

Financial Disclosure statement:

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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