

Efficacy of Positional Release Therapy in the Treatment of Frozen Shoulder

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ABSTRACT

Objective: The purpose of the research study was to determine the effectiveness of Positional Release Therapy (PRT) in managing patients suffering from frozen shoulder.

Methodology: This experimental study was conducted at Bone Care Trauma Center, Hyderabad, Sindh, Pakistan from March 2019 to Sept 2019, involving 15 patients with adhesive capsulitis who had limited shoulder movement and inadequate response to medications. Participants were assessed using the VAS for pain intensity, Shoulder Pain and Disability Index (SPADI) for pain and disability, and goniometry for range of motion (ROM) in shoulder movements. After obtaining informed consent, patients received 12 sessions of PRT over 4 weeks. The PRT focused on tender points, positioning the affected area for 90 seconds to alleviate symptoms. Post-intervention, active exercises were performed, and data were analyzed using SPSS version.

Results: Out of all 5 were males and 10 were females. There were significant improvements in pain, disability, and shoulder range of motion (ROM) after the intervention. Pain levels, assessed by the VAS, significantly decreased (Mean = 2.87, $p = .000$), and disability scores, measured by the SPADI scale, also improved (Mean = 13.54, $p = .000$). Additionally, both active and passive ROM, including flexion, extension, abduction, and rotations, demonstrated statistically significant improvements, p -values were quite significant ($P < 0.05$).

Conclusion: The study concluded that PRT has notable effectiveness in reduction of pain and disability among patients suffering from frozen shoulder.

Key Words: Positional Release Therapy, Pain, VAS, frozen shoulder, ROM

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Introduction

Manual therapy, a technique applied to joints and soft tissues, is also used in combination with heat therapy, cold therapy, muscles energy technique, electrical stimulation, myofascial techniques and acupuncture.¹ PRT is used to treat sub-acute and chronic muscle spasm, manage pain and reduce disability. It is a popular conservative treatment of frozen shoulder. To relieve the dysfunction in the joint, the technique is based on locating tender points first and then place the patient in the position of ease to release tender points.² As a result, tissues get relaxed, which ultimately leads to increase in circulation and reduction of inflammation. Moreover, positional release therapy eliminates the peripheral & central sensitization.³

Joint mobilization is effective passive movements, which use varied range of exercise to treat painful and stiff synovial joints.⁴ The normal *gleno-humeral* biomechanics can be attained by stretching the joint capsule, using specific joint mobilization technique. Various studies have illustrated that mobilization is significant in correcting rotational deficits of gleno-humeral joint, especially external rotation.⁵ On the other hand, high grade mobilization seems more helpful for improving mobility and decreasing disability than low grade mobilization.



Figure I: Positional Release Technique.

Myofascial trigger point in subscapularis muscle cause limitation in shoulder elevation and external rotation. Study suggests that spray and stretch technique for the subscapularis and latissimus dorsi muscles are more effective to reduce pain and irritation of trigger points thereby improves lengthening of tight muscles.⁶ By applying suitable treatment techniques and modalities in an innovative and careful manner, the physical therapist can increase the rate of recovery from frozen shoulder.⁷

Methodology

It is an experimental study design, in which data was collected from Bone Care Trauma Center Hyderabad, Sindh, Pakistan March 2019 to Sept 2019. Through simple random technique, 15 patients suffering from adhesive capsulitis with pain range in between 3-9 cm on Visual analogue scale, limited shoulder movements and insufficient response to the medications as per the prescription of orthopedic specialist were selected. The study excluded patients with rotator cuff tear, fracture in and around shoulder, peripheral neurological involvement in the upper extremity and infection within the joint or surgery reported lately (not more than 6 months)

Following medical devices were used;

- Goniometer
- Shoulder Pain and Disability Index scale (SPADI)
- Visual Analogue Scale (VAS)

After obtaining informed consent from the participants, the VAS was used to assess pain intensity. The VAS score ranges from 0 to 10, where 0 indicates no pain and 10 represents severe pain.

In addition, the Shoulder Pain and Disability Index (SPADI) was employed to evaluate both pain intensity and the level of disability. Following this, goniometry was used to measure the range of motion (ROM) of the shoulder joint. ROM was assessed in the following movements: flexion, extension, abduction, medial rotation, and lateral rotation. Three trials were recorded for each direction of movement. Pre- and post-test results were collected to evaluate changes in pain and shoulder joint ROM.

Pain intensity and range of motion (ROM) were measured through pre- and post-tests. Each patient received 12 treatment sessions (3 sessions per week) over a period of 4 weeks to assess the effectiveness of Positional Release Therapy (PRT).

Tender points were located, and the affected body part was positioned in a position of ease, which was maintained for a minimum of 90 seconds. During this period, patients reported sensations such as warmth, vibration, pulsation, and occasionally a reproduction of symptoms. After the release of pressure, symptoms were alleviated, and patients commonly reported a sense of muscle lengthening and relaxation.



Figure 2. III Positional release technique for (A) Latissimus Dorsi, (B) Teres Major (C) Pectoralis Minor (D) Infraspinatus muscles.

After the intervention, subjects performed 10 repetitions of simple active exercises, which included pendulum exercises, finger ladder, shoulder wheel, shoulder pulley, and wand exercises. Following data collection, statistical analysis was conducted using SPSS version 23.

Results

Table 1 illustrates the gender of the participants. Out of 15 patients, 5 (33.3%) were male while 10 (66.7%) were female.

Table I: Gender distribution of study participants		
Gender	Frequency	Percentage
Male	5	33.3
Female	10	66.7
Total	15	100.0

Figure 1 showed Mean and Standard Deviation of age; Mean $\pm$ SD of age was 48.1333 ± 6.20906

Table II shows the results of the paired t-test for pain, disability, and shoulder joint range of motion (ROM) before and after the intervention. There was a significant reduction in pain levels, as indicated by the VAS (Mean = 2.87, $p = .000$), and in disability scores measured by the SPADI scale (Mean = 13.54, $p = .000$). Similarly, both active and passive ROM, including flexion, extension, abduction, medial rotation, and lateral rotation, showed statistically significant improvements after the treatment. All changes had p -values less than .001, indicating a highly significant effect of the intervention on improving shoulder mobility and reducing pain and disability.

Table II: Paired t test of VAS and SPADI scale and active and passive ROM				
Variables	Mean	SD	t-value	Sig. level
VAS	2.87	.35	31.553	.000
SPADI	13.54	5.12	10.231	.000
Passive Flexion	-22.67	14.98	-5.859	.000
Passive Extension	-9.40	5.58	-6.527	.000
Passive Abduction	-21.13	14.56	-5.620	.000
Passive Medial Rotation	-8.93	5.91	-5.855	.000
Passive Lateral Rotation	-11.20	6.56	-6.613	.000
Active Flexion	-27.67	26.78	-4.001	.001
Active Extension	-7.20	5.88	-4.741	.000

Active Abduction	-21.67	14.35	-5.847	.000
Active Medial Rotation	-8.67	5.91	-5.678	.000
Active Lateral Rotation	-9.93	9.35	-4.113	.001

Discussion

This study evaluated the effectiveness of Positional Release Therapy (PRT) in treating patients with frozen shoulder, focusing on pain reduction, functional improvement, and range of motion (ROM) enhancement. The findings revealed significant improvements across all measured outcomes, underscoring PRT's potential as a therapeutic intervention for frozen shoulder. In this study, the majority of participants were female (66.7%) as compared to male (33.3%) counterparts, with a mean age of 48.13 ± 6.21 years. This demographic distribution indicates a higher prevalence of adhesive capsulitis, commonly known as frozen shoulder, among middle-aged women. This aligns with existing literature advocating female predominance to developing frozen shoulder. For instance, a study conducted in Pakistan by Seher et al.¹³ reported a higher prevalence of frozen shoulder in females (45.70%) than in males (28.07%) among patients with shoulder pain, highlighting a significant gender disparity. Another study conducted by Kelley et al.¹⁴ analyzed patients treated for frozen shoulder also found that women constituted a larger proportion of cases (946 women vs. 431 men), suggesting a gender-related predisposition.

Age-related prevalence of frozen shoulder in this study may be attributed to age-associated degenerative changes and hormonal fluctuations, particularly in women undergoing menopause, which can influence joint health and inflammatory responses. Hormonal factors, especially estrogen deficiency during menopause, have been implicated in the increased risk of frozen shoulder among women. Estrogen is known to play a role in maintaining connective tissue health, and its decline may contribute to the development of joint stiffness and pain characteristic of frozen shoulder.¹⁵

In our study, the application of Positional Release Therapy (PRT) resulted in a significant reduction in pain levels, as evidenced by the decrease in Visual Analog Scale (VAS) scores (mean $\pm$ SD: 2.87; $p < 0.001$). Additionally, functional

disability, assessed via the Shoulder Pain and Disability Index (SPADI), showed significant improvement ($p < 0.001$). These findings are consistent with literature suggesting that manual therapy techniques, such as PRT, can effectively enhance joint mobility in frozen shoulder patients. Research studies conducted by Chandrasekaran et al.,¹⁶ and Cagnie et al.,¹⁷ collectively support the effectiveness of manual therapy techniques, including PRT, in reducing pain and improving function in patients with frozen shoulder. In this study, significant enhancements were observed in both passive and active ROM following PRT. Passive movements, including flexion, extension, abduction, medial rotation, and lateral rotation, all demonstrated statistically significant gains ($p < 0.001$). Active movements mirrored these improvements, with notable increases in flexion ($p = 0.001$) and other directional movements showing similar trends.

The significant improvements observed in our study further reinforce the potential of PRT as a viable conservative treatment option for managing frozen shoulder. The observed improvements in pain, function, and ROM suggest that PRT can be a

valuable component of conservative management strategies for frozen shoulder. Given its non-invasive nature and the absence of reported adverse effects, PRT offers a safe alternative or adjunct to other physiotherapeutic interventions. However, it's noteworthy that while PRT is effective, some studies have reported greater benefits with other techniques. For example, the Ola Grimsby technique demonstrated superior outcomes in reducing pain and improving shoulder external rotation compared to subscapularis PRT.¹⁸

Conclusion

Study concluded that the PRT is effective in managing pain, reducing muscle spasm, and improving range of motion in patients with frozen shoulder. Similar studies also highlight its role in reducing disability. However, some research has shown limited improvement in pain and ROM, with only slight changes in disability scores. These mixed outcomes suggest that while PRT holds promise, its effectiveness may vary across individuals. Further large-scale studies are recommended to validate its consistent benefits.

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