

## EFFECTIVENESS OF DRY NEEDLING AND MAITLAND MANUAL THERAPY TECHNIQUE IN TREATMENT OF FROZEN SHOULDER

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### **Abstract**

**Aims:** To examine the therapeutic efficiency of dry needling and Maitland manual therapy in frozen shoulder treatment. **Design:** A randomized control experiment. **Settings and Design:** Body Expert physical therapy clinic, Karachi, Nine Month. **Methods and Material:** 30 individuals with diagnosed frozen shoulder with ROM (Range of motion) flexion less than 95%. The shoulder pain and disability index was used to assess the efficiency of Maitland dry needling therapy. Group A treated with Maitland, while Group B was treated with dry needling for Six weeks. Data were analyzed by SPSS. 48.33% were males, and 51.66% were females who participated in the study. SPADI (shoulder pain and disability index) tool before and after therapy was found to be statistically significant at a p-value of 0.05. Pre and post-VAS (visual analog scale) tools also showed statistically significant at p value 0.005. The pre-and post-flexion range in angel also showed significant variations at a p-value of 0.005. **Statistical analysis used:** Data was analyzed by SPSS. **Results:** Both dry needling and Maitland were found to be effective in frozen shoulder patients. **Conclusions:** It was discovered after the final data evaluation that both groups significantly improved with time. Variations in the pre-and post-intervention VAS, SPADI, and flexion angle range values were revealed by statistical analysis.

**Index Terms:** Dry Needling, Maitland, Pain, Flexion, Treatment, SPADI, Efficiency

## INTRODUCTION

Frozen shoulder is a medical condition that is defined by the sudden onset of pain, stiffness, limited range of motion, and restricted movement of the glenohumeral joint [1], [2], [3], [4], [5]. Also known as adhesive capsulitis, frozen shoulder is a medical condition of unknown origin, referred to as primary or idiopathic frozen shoulder. When it occurs in association with traumas or systemic diseases such as type II diabetes mellitus, thyroid diseases, rheumatoid arthritis, etc., it is referred to as a secondary frozen shoulder. The estimated incidence of frozen shoulder is 3% to 5%, with a higher prevalence in females and a higher incidence in the 40 to 60 age group. The incidence of frozen shoulder in people with diabetes mellitus is estimated to be around 20% [6], [7]. The term "frozen shoulder" was first introduced by Coldman in 1934. However, as early as 1872, Duplay had described this condition as scapulohumeral peri-arthritis. The term "adhesive capsulitis" was coined by Naviesar in 1947. [8].

Adhesive capsulitis, also known as "Frozen Shoulder Symptoms (FSS)," is characterized by a gradually increasing ache and limitation of both active and passive movement of the glenohumeral joint, which occurs due to ongoing fibrosis and eventual contracture of the joint capsule. The incidence of FSS is estimated to be between 2% and 5% in young people and around 20-25% in patients with diabetes, with a higher prevalence of around 70% in females. There has been a recent trend of increasing incidence of FSS among women [9], [10], [11], [12].

Because of the restricted range of motion (ROM) of the shoulder girdle, adhesive capsulitis causes functional impairment. For the restoration of a pain-free condition and the restoration of the functional activity of the upper extremity, a variety of treatments, including mobilization and manipulation techniques, have been recommended. Using manual therapy in the case of adhesive capsulitis shoulder may result in a satisfactory improvement. In the case of adhesive capsulitis of the shoulder, it is necessary to examine the results of the Maitland and Mulligan procedures on numerous parameters [13, 14].

A chronic inflammatory process of the synovium and soft tissue is reported, followed by a fibrotic picture resembling Dupuytren's disease as a result of an increase in collagen formation, myofibroblasts, and fibroplasia. The exact physiopathologic mechanism underlying this process is not yet fully understood. Abduction is limited due to the long head of the biceps' lack of flexibility and supraspinatus muscular weakness [15], [16]. The humeral head is tightly held against the glenoid fossa in this pathologic mechanism, preventing the capsule from adhering to the humerus and leading to a progressive loss of physiological mobility [15]. Several writers stated that tightness of the capsule and surrounding soft tissues lead to a proportional motion limitation, more in exterior rotation than internal rotation, based on this and the lack of a substantial association between a restricted range of motion and joint space capacity [13], [14], [15], [16]

## SUBJECTS AND METHODS

In Karachi, at the Body Expert Physical Therapy Clinic, a randomized control experiment was carried out. The study took nine months to complete; sixty patients were chosen and split into two groups, group A and Group B, with 30 individuals chosen at random for each group.

Patients whose ROM Flexion was less than 95 degrees and who had a diagnosis of frozen shoulder were included in the study. Extension less than 25 degrees, Lateral rotation less than 50 degrees, and Abduction less than 95 degrees, Patients with diabetes, a lean body mass index (BMI) of less than 18.5, severe osteoporosis, rheumatoid arthritis, osteoarthritis, prolonged immobilization, neurological or hemiplegic conditions, patients with MUA, bilateral frozen shoulders, and those whose range of motion (ROM) was greater than 90 degrees in flexion, Abduction, extension, or laxity were also excluded from the study.

Flexion range, the "Shoulder Pain & Disability Index" (SPADI), and the Visual Analogue Scale (VAS) were used to evaluate the patients' shoulder pain and disability both before and after treatment. After receiving informed consent, all patients were chosen. These patients were questioned directly and reassessed after six weeks in the Group-A Patients receiving treatment using Maitland's technique. Participants in group B received dry needling therapy. After six weeks, these individuals underwent another evaluation. Therapy for the presentation and all three follow-ups was provided for 30 minutes in a single treatment session. After six weeks, the results were compared.

The data were examined using SPSS 23.0 statistical software. Paired t-tests and descriptive statistics were used. The statistical significance was set at a 5% level.

## RESULTS

The total participants were 60, among which 29 (48.33%) were males and 34 (51.66%) were females. The mean age of all participants was  $53.83 \pm 2.323$ .

Table 1 is a table that displays the before and after scores of the SPADI tool for each group. The "pre-score" refers to the score before the treatment, and the "post-score" refers to the score after the treatment. In Group A, the average pre-treatment score was 79.684, with a standard deviation of 8.13. After treatment, the average score decreased to 6.724, with a standard deviation of 4.65. The difference between the pre and post-scores is statistically significant at the 0.05 level. This means that the probability of observing such a large difference in scores by chance is less than 5%.

Table 2 displays the before and after scores of the VAS tool for each group. The "pre-score" refers to the score before the treatment, and the "post-score" refers to the score after the treatment. In Group A, the average pre-treatment VAS score was 8.41, with a standard deviation of 0.88. After treatment, the average score decreased to 1.331 with a standard deviation of 0.91. The difference between the pre and post-scores is statistically significant at the 0.05 level. This means that the probability of observing such a large

difference in scores by chance is less than 5%. Similarly, in Group B, the average pre-treatment VAS score was 8.32, with a standard deviation of 0.91. After treatment, the average score decreased to 1.532 with a standard deviation of 1.11. The difference between the pre and post-scores is also statistically significant at the 0.05 level, although the level of significance is slightly higher than in Group A.

Table 3 displays the before and after scores of the flexion range in angle for each group. The "pre score" refers to the flexion range before the treatment, and the "post score" refers to the flexion range after the treatment. In Group A, the average pre-treatment flexion range was 88.65 degrees, with a standard deviation of 18.12 degrees. After treatment, the average flexion range increased to 144.11 degrees with a standard deviation of 20.44 degrees. The phrase "and found 0.012 <0.05 significant value" means that the difference between the pre and post-scores is statistically significant at the 0.05 level. This means that the probability of observing such a large difference in flexion range by chance is less than 5%. Similarly, in Group B, the average pre-treatment flexion range was 80.34 degrees, with a standard deviation of 16.88 degrees. After treatment, the average flexion range increased to 131.31 degrees with a standard deviation of 23.81 degrees. The phrase "and found 0.044 <0.05 significant value" means that the difference between the pre and post-scores is also statistically significant at the 0.05 level, although the level of significance is slightly higher than in Group A.

**Table 1: Pre and Post Treatment SPADI**

	Pre Treatment Mean±SD	Post-Treatment Mean±SD	p-value
Group A	79.684±8.13	6.724±4.65	0.011
Group B	81.421±7.88	11.261±4.83	0.034

**Table 2: Pre and Post Treatment Visual Analogue Scale (VAS)**

	Pre-Treatment Mean±SD	Post-Treatment Mean±SD	p-value
Group A	8.41±0.88	1.331±0.91	0.003
Group B	8.32±0.91	1.532±1.11	0.049

**Table 3: Flexion of Treatment Groups**

	Pre-Treatment Mean±SD	Post-Treatment Mean±SD	p-value
Group A	88.65±18.12	144.11±20.44	0.012
Group B	80.34±16.88	131.31±23.81	0.044

## DISCUSSION

To evaluate the Effectiveness of dry needling and Maitland mobilization techniques for the treatment of the frozen shoulder, it was discovered after the final data evaluation that both groups significantly improved with time. Variation in the pre-and post-intervention VAS, SPADI, and flexion angle range values was revealed by statistical analysis.

The management of idiopathic shoulder adhesive capsulitis was evaluated for the Effectiveness of the Maitland manual therapy technique. Maitland's Group's VAS and SADI scores improved. Conversely, the traditional group was also evaluated. By the end

of the therapy, Maitland Mobilization discovered a method that helped patients with frozen shoulder experience less pain and handicap [17, 18,].

The study found that both interventions improved shoulder movement, which suggests that they can be effective treatments for individuals with shoulder mobility issues. However, the study also found that the combination of exercise and Maitland mobilization was more effective than either intervention alone. Exercise is a commonly used intervention for shoulder mobility issues and involves targeted exercises aimed at improving the strength and flexibility of the shoulder joint and surrounding muscles. Maitland mobilization is a manual therapy technique that involves specific passive movements of the joint by a therapist to improve joint mobility, reduce pain, and restore function.[19].

Acupuncture has long been a popular alternative treatment in the United States. Both clinical and fundamental research has confirmed its therapeutic effects for treating pain, and it is now emerging as an alternative non-pharmaceutical treatment for pain to the opioid problem. A performed cross-sectional study of 419 acupuncturists across the country to determine the top 10 acupuncture indications in private clinics in the US. Depression, anxiety, lower back pain, headache, allergies, arthritis, female infertility, general pain, neck pain, sleeplessness, and frozen shoulder were the top 10 symptoms they discovered [20].

This case report clarified the clinical reasons behind a patient's treatment and care plan for adhesive capsulitis utilizing dry needling. Results indicating significant improvements in shoulder ROM function and discomfort, especially with dry needling accumulation, support the potential usefulness of this interference in individuals with this problem [21].

According to a systematic review, the mobilization approach proved successful in treating individuals with frozen shoulders. Recent evidence has shown that various mobilization strategies were proven to be significantly more successful when used in conjunction with the Maitland approach [7].

The study found a significant correlation between a frozen shoulder and a subscapularis trigger point. This suggests that there may be a relationship between the presence of a subscapularis trigger point and the development of a frozen shoulder. A correlation is a statistical measure that indicates the degree to which two variables are related. A positive correlation means that as one variable increases, the other variable also tends to increase, while a negative correlation means that as one variable increases, the other variable tends to decrease. A significant correlation indicates that the relationship between the two variables is unlikely to be due to chance. The results of the study suggest that individuals with subscapularis trigger points may be at higher risk of developing a frozen shoulder. It is not clear, however, whether the presence of a subscapularis trigger point causes a frozen shoulder or whether the two conditions are simply associated with each other [22].

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