



A comparative study on the effectiveness of Mulligan mobilization versus Positional release therapy technique in patients with Adhesive capsulitis

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ABSTRACT

Adhesive capsulitis is a painful condition in which the movement of the shoulder becomes limited and functional activity is affected. Adhesive capsulitis occurs when the shoulder joint capsule become thick, stiff and inflamed. The aim of the study is to compare the effectiveness of Mulligan movement with mobilization versus Positional release technique on shoulder range of motion and functional activity in patients with adhesive capsulitis. 30 patients were randomly divided into two groups. Group A (N = 15) received Mulligan mobilization technique and Group B (N = 15) received positional release therapy. The shoulder range of motion (Abduction, External rotation, Internal rotation) was measured by goniometer, the functional activity by SPADI questionnaire. The results showed that significant differences in shoulder ROM Abduction (t = 14.18, p = 0.000), Internal rotation (t = 13.80, p = 0.000), External rotation (t = 15.87, p = 0.000) and SPADI questionnaire (t = 13.94, p = 0.000) were observed in group A patients when compared to group B. In conclusion the Mulligan mobilization technique was effective to improve the shoulder ROM and reduce functional disability in patients with adhesive capsulitis compared to Positional release technique.



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INTRODUCTION

Adhesive capsulitis is termed as a glenohumeral joint stiffness resulting from a non-contractile element unless it coexists with a non-contractile lesion both active motion and passive motion are painful and restricted in the capsular pattern with external rotation is the most limited followed by abduction and internal rotation (Donatelli, 2011).

The painful phase typically lasts 10 to 36 weeks. The patient presented with spontaneous onset of shoulder pain with stiffness and the glenohumeral capsule volume is greatly reduced.

Stiffening Phase which may last up to 4 to 12 months

and patient has restricted range of motion in this phase with a characteristic pattern in the loss of external rotation, internal rotation, and abduction.

Thawing phase is characterized by the gradual recovery in the range of motion. The thawing phase lasts an average of 5 to 26 months (Reeves, 1975).

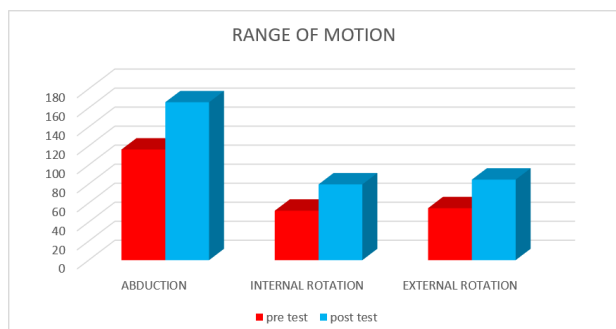


Figure 1: Shoulder range of motion in group A intervention

cle recruitment. Mulligan mobilization with movement was a combination of an active movement with simultaneous passive accessory mobilization to achieve painless range of motion by restoring the reduced accessory glide (Excelby, 1996).

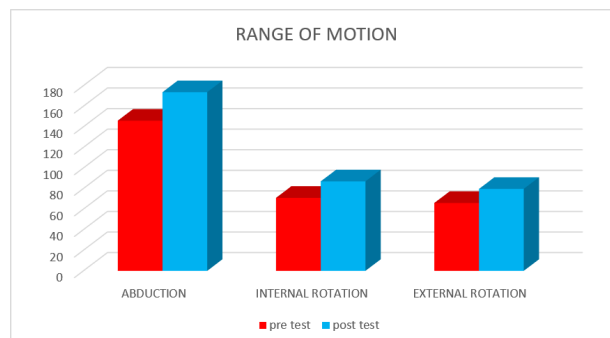


Figure 3: Shoulder range of motion for group B intervention

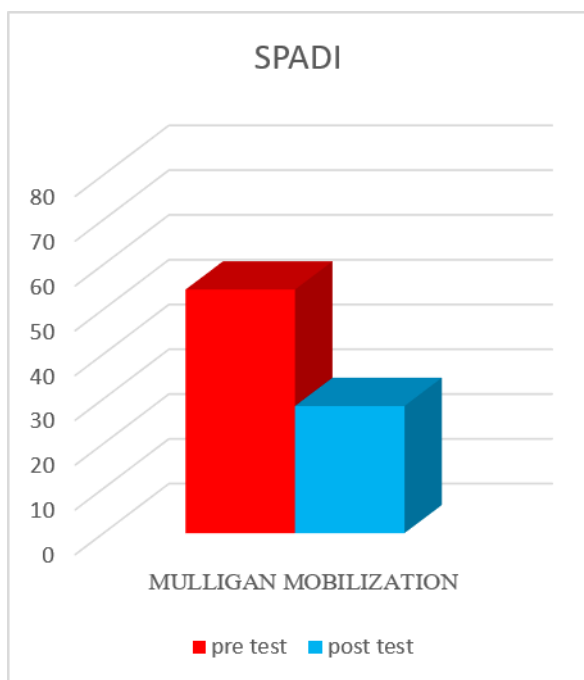


Figure 2: SPADI score for group A intervention

The causes of adhesive capsulitis include immunologic, inflammatory, biochemical, and endocrine alterations. Secondary causes can be after surgery, soft tissue trauma, and fracture in the shoulder.

The movement produced by manual therapy techniques can also reduce pain by the activation of mechanoreceptors which can inhibit nociceptive stimulus through the pain gate-control mechanism (Threlkeld, 1992).

Mulligan mobilization with movement technique improve the quality of joint intra-articular gliding, neurodynamics and the facilitation of correct mus-

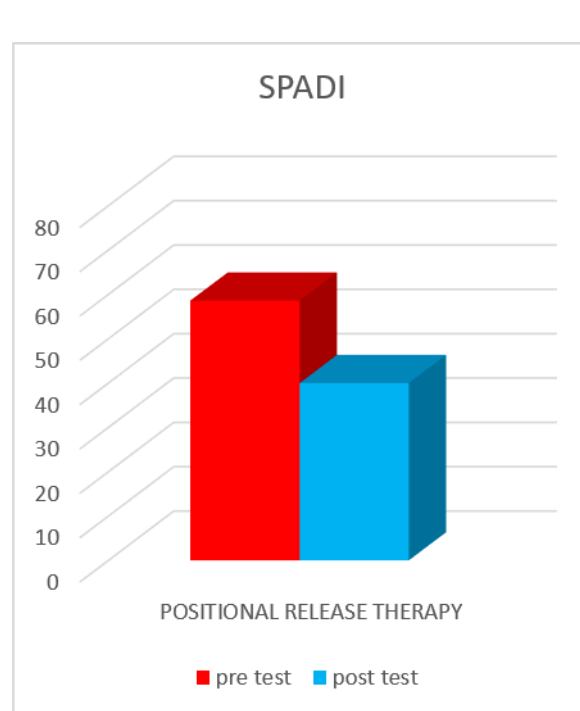


Figure 4: SPADI score for group B intervention

Positional release therapy was originally termed as strain-counter strain technique. It was a therapeutic technique that uses the tender points (Tps) and a position of comfort (POC) in a muscle to resolve the somatic dysfunction of the muscle. Positional release technique was opposite to the stretching mechanism (Speicher and Draper, 2006). Positional release technique was used to normalize the muscle tone, decreases the fascial tension, improve joint mobility and increase localized circulation (D'ambrogio and Roth, 1997).

Table 1: Analysis Of Shoulder ROM And SPADI in Mulligan mobilization group.

Mulligan's Mobilization		Mean Value	Mean Difference	T-Value	P-Value
Abduction	Pre-Test	116.33	49.67	14.188	0.000**
	Post-Test	166.00			
Internal Rotation	Pre-Test	52.00	27.67	13.806	0.000**
	Post-Test	79.67			
External Rotation	Pre-Test	54.67	30	15.875	0.000**
	Post-Test	84.67			
SPADI	Pre-Test	54.40	26	13.945	0.000**
	Post-Test	28.40			

** Indicates (P<0.05) Significant

Table 2: Analysis Of Shoulder ROM And SPADI in Positional release therapy Group.

Positional Release Therapy		Mean Value	Mean Difference	T-Value	P-Value
Abduction	Pre-Test	146.00	27.67	5.245	0.000**
	Post-Test	173.67			
Internal Rotation	Pre-Test	71.00	16	6.666	0.000**
	Post-Test	87.00			
External Rotation	Pre-Test	66.00	13.67	13.352	0.000**
	Post-Test	79.67			
SPADI	Pre-Test	58.60	18.60	8.408	0.000**
	Post-Test	40.00			

** Indicates (P<0.05) Significant

Table 3: Analysis of Shoulder ROM and SPADI between the group A (Mulligan mobilization) and group B (Positional release therapy)

Post Test Intervention	Group	Mean Difference	T-Value	P-Value
Abduction	Group A	49.67	3.4750	0.001**
	Group B	27.67		
Internal Rotation	Group A	27.67	3.731	0.0009**
	Group B	16.00		
External Rotation	Group A	30.00	7.586	0.0001**
	Group B	13.66		
SPADI	Group A	26.00	2.558	0.0162**
	Group B	18.60		

** Indicates (P<0.05) Significant

METHODOLOGY

Participants

This study was conducted in the outpatient department of physiotherapy at Ishari Velan Mission Hospital, Chennai. Thirty patients with adhesive capsulitis were selected. The inclusion criteria for the study were (1) Age 45-65 years. (2) Unilateral adhesive capsulitis. (3) Thawing stage of adhesive cap-

sulitis. (4) Both males and females. The exclusion criteria were (1) Traumatic injuries of shoulder. (2) Neurological disorders. (3) Reflex sympathetic dystrophy. (4) Previous surgery and manipulation under anesthesia.

Study procedure

In the study, 30 subjects were selected by random sampling method based on inclusion criteria. The procedure and purpose of the study were

explained and informed consent was obtained from each patients. The subjects were divided into two groups. Group A (N = 15) received Mulligan mobilization technique, group B (N = 15) received positional release therapy for two weeks. The shoulder range of motion (Abduction, External rotation, Internal rotation) was measured by using the goniometer the functional activity by SPADI questionnaire at first day of visit before treatment and after two weeks.

Outcome Measures

Range of motion: The range of motion of shoulder abduction, internal rotation, and external rotation is measured by goniometer.

Shoulder functional disability: The SPADI (Shoulder Pain And Disability Index) questionnaire was used to measure the shoulder functional disability.

Data Analysis and Result

Descriptive statistical analysis was carried out in the present study. Outcome measures are analyzed & presented as mean. The mean values were used to compare the outcomes within the groups. Significance assessed at 5% level of significance with p value was set at $\alpha=0.05$ (p value <0.05) less than this is considered as statistically significant difference. The statistical software namely SPSS 25.0 were used for analysis of data.

This study was completed with a total of 30 subjects. In Mulligan group 15 subjects with mean age 56.40, in positional release therapy group 15 subjects with mean age 54.33 are included in this study.

RESULTS AND DISCUSSION

Range of motion

Abduction the post test mean difference values of two groups were analyzed. The mean difference in the Mulligan group were 49.67 and the positional release therapy group were 27.67 and the p value is 0.000 ($p<0.05$) are presented in Table 1 and Table 2 & shown in Figure 1 and Figure 3.

Internal rotation the mean difference in the Mulligan group was 27.67 and the positional release therapy group was 16. External rotation the post test mean difference values between the two groups are analyzed, the mean difference of Mulligan group was 30 and the positional release therapy group was 13.67 are presented in Table 1 and Table 2 & shown in Figure 1 and Figure 3.

It indicates Mulligan mobilization technique improve the range of motion compared to positional release therapy.

Shoulder Pain And Disability Index (SPADI)

The post test values between the two groups are compared the mean difference of Mulligan group was 26 and the positional release therapy group was 18.6 are presented in Table 1 and Table 2 & shown in Figure 2 and Figure 4 it indicates Mulligan mobilization improved the shoulder function when compared to the positional release therapy.

The post-test values of both groups were analyzed it shows a statistically significant difference in the p values of $p<0.05$. The mean difference between the two groups are compared the Mulligan group shows statistically significant difference than the positional release therapy group are presented in Table 3.

The concept of adhesive capsulitis leads to tight and thickened capsule which sticks to the humerus and restricts the movements of shoulder joint. The normal shoulder range of motion and shoulder function can be improved by renovation of shoulder joint capsule extensibility and the mobilization techniques has been recommended to improve the shoulder range of motion and shoulder function (Diercks and Stevens, 2004).

Mobilization techniques is given to improve the normal tissue extensibility of the shoulder joint capsule and it also stretches the tightened capsule to encourage beneficial effects in the shoulder joint (Yang Wang S-F and J, 2007).

The mechanism in the Mulligan mobilization with movement (MWM) treatment effects may include changes in the shoulder joint, and the muscles around it. The changes in motor control systems and pain gate mechanism will produce an instantaneous pain relief and it also improves shoulder range of motion (Wright, 1995).

The Mulligans mobilization with movement (MWM) technique has further benefit which may activate the additional proprioception in the muscles by tendon stretch, which will help to renovate the affected shoulder range of motion (Kachingwe et al., 2008).

CONCLUSIONS

This study concludes that Mulligan mobilization technique is more significant improvement in shoulder Range of motion and functional ability than positional release technique in patients with adhesive capsulitis. Mulligan mobilization with movement (MWM) is a manual therapy technique was used to correct the positional fault in the joint and helps to restore the joint play movements. The movement produced by manual therapy techniques can also reduce pain by the activation of mechanoreceptors which can inhibit nociceptive stimulus through the

pain gate mechanism this will decrease the pain and reduce disability.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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