

Impact of Mulligan Taping Technique in Patients with Frozen Shoulder

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Abstract: Background and Purpose: Taping technique is a tool used to treat patients with limited range of motion due to pain in orthopedic rehabilitation that to date it had limited research available for its efficacy. Therefore, the aim of this study was to determine the influence of mulligan taping practice in the management of subjects with frozen shoulder syndrome (FSS). Subjects: Twelve male subjects with FS were randomly recruited to participate in the study. Method: Participants were divided into 2 groups (group A received the traditional physical therapy program including electrical therapy (US & TENS), ROM exercises (stretching) and strengthening, and group B received traditional physical therapy program, plus the mulligan taping technique as a form of manual therapy. The duration of each management was 6 weeks. Results: There were a statistically significant improvements found in pain and range of motion in the study group. Conclusion: Mulligan taping can be used in treating patients with FS together with traditional physical therapy program. Taping contributed to reduction of pain. Additionally, ROM improved significantly following placement of mulligan taping.

Keywords: Frozen shoulder, adhesive capsulitis, Mulligan taping.

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I. Introduction

Frozen shoulder (FS) is considered as a debilitating disorder that is very difficult to be handled. It is characterized by dull or aching pain that is worsened with attempted motion and limitation of motion in the shoulder joint. This seriously limits the shoulder's ability to move, and is a reason for the shoulder to freeze. The term FS is described by Codman in 1934 (Abraham, J. L., 2014).

Frozen shoulder is defined as one of the several terms applied to a clinical condition that is characterized by several restrictions of motion of the glenohumeral joint. Additional terms for this disorder are capsulitis, peri-arthritis, Adhesive capsulitis, and Adherent bursitis (Resnick, D. (Ed.), 2002).

The main cause of FS remains unknown, however, there is data to advocate that there is an inflammatory process causing fibrotic alterations of the joint. Tamai, K., et al., (2014) & Karwowski W., (2006) reported presence of an inflamed synovium in arthroscopic capsular release.

The rate of FS is not exactly known but, it is expected that 3% of individuals can be affected with FS over their lifespan. Comparing the gender, females tend to have a higher incidence to be affected than males, and there is no liking for race (Shiers J., 2005).

Many studies shown that there were common diseases that have been linked with FS, some of these disease are cerebral vascular accidents (CVAs), osteoporosis, cardiopulmonary diseases, Dupuytren's disease, thyroid disease, and diabetes. The patients who suffer from diabetes have a high rate of developing FS, that exists between (10-20%) compared with the others (2-5%). In addition, patients who have type-1 diabetes even have a higher incidence of bilateral FS (36%), (Teys, P., Bisset, L., & Vicenzino, B., 2008 & Hand, C., et al., 2015).

The specialized physiotherapist usually uses the manual therapy and exercises in order to treat pain and limitation of movement that result from frozen shoulder. However, there is a limited research on the effect of mulligan taping technique on frozen shoulder (Brian R. Mulligan, 1999). Taping (or strapping) is the use of a

tape applied to the body to afford structural care, it involves taping over and around muscles in order to either give support, or avoid contraction. This technique is used to alleviate pain by lifting the skin and adjusting the shoulder capsule; therefore releasing pressure on the neural receptors (Shiers J., 2005) and decreasing the amount of friction in order to enable more rapid gains in ROM, strength, and function. The initial outcomes are promising for increasing patient's tolerance to physical therapy (Teys, P., et al., 2008 & Hammer W.I., 2006).

The aim of the current study was to examine the influence of mulligan taping procedure in the management of patients with frozen shoulder syndrome (FSS).

II. Material And Methods

Subjects with FS were recruited from the outpatient clinic at King Abdulaziz University Hospital.

All patients with FS fulfilled the following inclusion criteria: having a painful stiff shoulder, limited active and passive ROM of shoulder, cannot sleep on the painful side, medically controlled diabetes mellitus and shoulder x-rays are normal from other musculoskeletal pathologies. Cases of primary FS were excluded. In addition, patients with heart disease were excluded.

Patients were selected randomly and were separated into two groups A and B.

Group A: Ten subjects received traditional physical therapy program, including electrical therapy (US and TENS), and ROM exercises (stretching and strengthening). They were treated with 2 sessions per week, at a highest of 6 weeks as regard to the case. The total length of the treatment was 30 minutes for each session.

Group B: Ten subjects received the traditional physical therapy program, plus the mulligan taping technique in the form of manual therapy. They were instructed to put the tape on during day times and to be off at night. They received maximum of 3 weeks, as 2 sessions per week, for 30 minutes per session.

Taping Technique Procedures

All subjects in the study group (B) got the taping method after receiving the traditional FS therapy. From standing position of the patient, the tape was applied to the shoulder and there is specific procedure to be followed: The first step: the supraspinatus muscle is pulled downward to gravity direction. The second step: The middle fibers of the deltoid muscle are pulled upward to the top of the shoulder. The third step: placing the tape on the inferior angle of the scapula, then pull it medially to the side of the vertebral column. This procedure will put the shoulder joint in a pain free position. Notice: each step should be repeated 4 to 6 times.

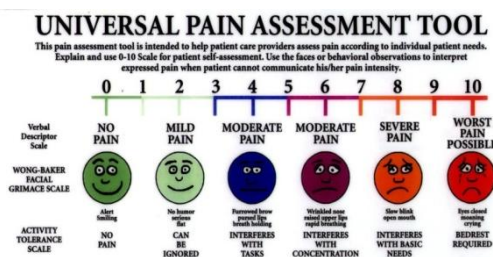


Fig. 1. Visual Analogue Scale (Adapted from Abrahm J., 2005).

III. Results

Range of Motion (ROM)

Before treatment, there was no significant difference between both groups ($p=0.291$). Following treatment, a highly meaningful improvement was found in the study group compared to that of the control group ($p = 0.027$). Also the results revealed a very highly important increase in the mean values within the study group before and after conduct ($p=0.025$), table 1. & fig.2.

Table 1. Comparison between study and control groups in shoulder ROM pre and post treatment.

ROM	Study group Mean ± SD	Control group Mean ± SD	p
pre	90.2±9.61	63.6±19.29	0.291
post	154.1±9.08	80.4±6.53	0.027
P	0.025	0.226	

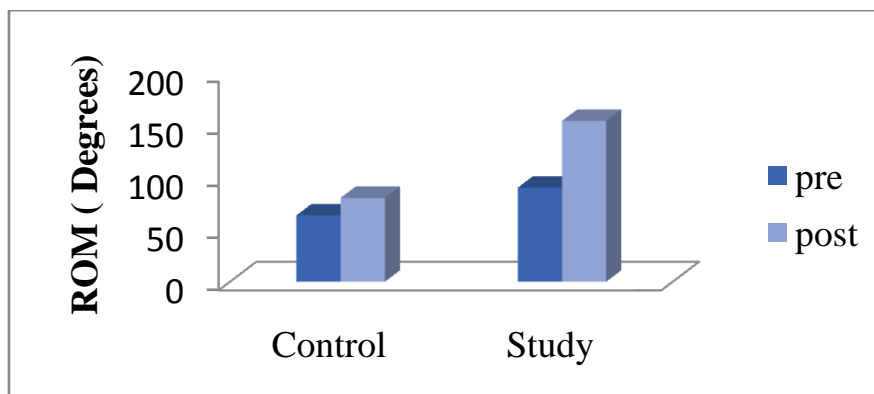


Fig. 2. Mean values of ROM pre and post treatment in the study and control groups.

Pain

Table 2 shows no statistically significant change between both groups before using the tape ($p=0.180$). When taping was used, there was a meaningful decline of pain in the study group in contrast to that of the control group ($p=0.028$). Furthermore, there was a great significant drop in pain within the study group after treatment ($p=0.042$), table 2 and fig. 3.

Table 2. Contrast between study and control groups in favor of VAS before and after management

Pain	Study group Mean \pm SD	Control group Mean \pm SD	p
before	7.2 \pm 1.3	8.2 \pm .44	0.180
after	0.4 \pm 0.89	3.75 \pm 2.5	0.028
p	0.042	.066	

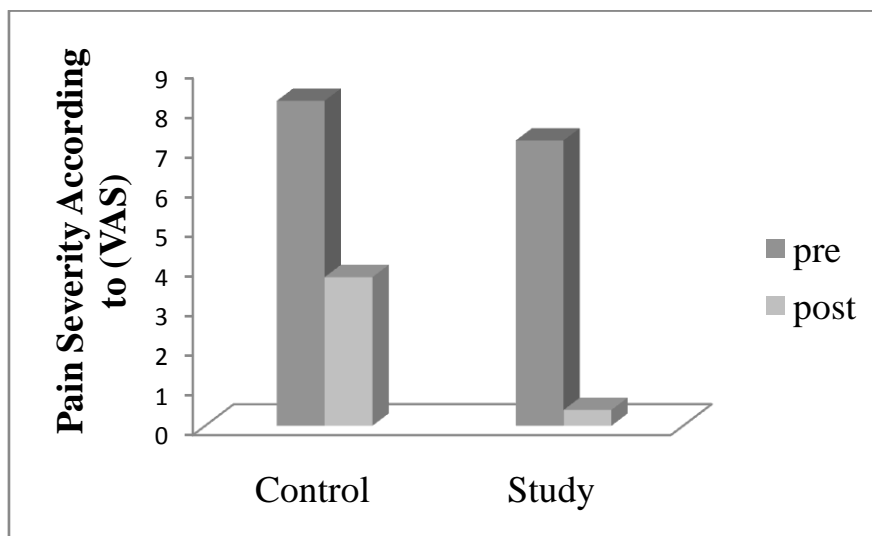


Fig. 3. Mean values of pain before and after management in both groups (the study and control groups).

IV. Discussion

Frozen shoulder is a condition that became common recently. Untreated FS leads to severe pain and limiting both shoulder active and passive movements of the patients. Mulligan taping technique is a rehabilitative treatment used with frozen shoulder patients to allow pain free movements and avoid new formation of shoulder capsule adhesions. The purpose of the current research was to assess the effectiveness of taping method in enhancing the limited range of movement and reducing pain in frozen shoulder patients.

The outcomes of the current study showed significant difference in the study group at the 6th session. We found that adding mulligan taping to the traditional therapy improved movement ability and lessened pain in the study group that was provided with taping technique in their treatment.

In agreement to the conclusions of the current study, PHTY, P. T. M. (2016) studied the effect of Mulligan taping technique in pain and ROM. Their results showed a meaningful and clinically significant progress in both ROM and PPT after using taping method. This result as well as Michlovitz S.L.; et al.,

(2004)&Teys P.; et al., (2008) designated that this manual treatment has a direct progressive effect on both ROM and pain in subjects with painful restriction of shoulder motion.

Furthermore, Mark D. Thelen et al., (2008) investigated the effect of taping on shoulder pain and used two different ways of tape application. The result of this study showed that immediate improvement in pain and free shoulder movement after tape placement in both groups and there were no variances between groups in the result of ROM, pain or debility grades during the interval, (Thelen M.D., et al., 2008).

As well there are many studies that used Mulligan taping technique in different places other than the shoulder, and all showed several benefits of it in many cases. Cushnaghan et al., (1994) used medical taping in order to reduce signs of knee osteoarthritis by three different ways of taping applied on subjects (medial, lateral, or neutral). The effects of taping on medial side of the patella showed notably improving in severity of pain (PHTY, P. T. M., 2016).

Moreover, Peter et al., (2009) found that taping reduced the degree of pain in patients complaining of unilateral shoulder impingement after 2 week of application. This study gives an indication about the effectiveness of scapular taping in the treatment of shoulder impingement (Miller, P., & Osmotherly, P., 2009).

Additionally, Vicenzino et al., (2003) used Mulligan taping technique to conclude the primary effects of a taping practice on grip power and discomfort in individuals with lateral spondylalgia. They treated subjects complaining of long-term lateral spondylalgia. The results delighted that adding taping to the treatment plan has a significant enhancement of pain reduction (Vicenzino B.; et al., 2003).

Furthermore, Christine et al., (2007) studied the effect of mulligan taping in thirty patients with ankle instability. They concluded that there was increased stability, confidence, and reassurance after ankle taping when performing the functional tasks. That was because the taping support and protect the unstable joint; to allow the movement in normal way with limited pain (Sawkins, K., et al., 2007).

All the previous studies showed effectiveness of Mulligan taping technique as a mean of treatment, which is similar to our findings.

V. Conclusion

There are many different forms of treatment to improve frozen shoulder cases, but we found that mulligan taping technique is the most effective and safest to be applied with no side effects, and has lower cost.

Patients regularly seek an explanation for the dramatic increase in range of motion and decrease in pain that is often achieved in one session. This is always guided by the basic rule of never causing pain. Furthermore, patients will see progressive and lasting improvement in range and pain for functional use of the shoulder.

All the techniques within Mulligan idea are predictable to provide the patients with an instantaneous enhancement in their conditions.

Regarding our results, we can conclude that mulligan taping technique has the effect of rapid regaining of the ROM and pain relieve based on our results.

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Authors' contributions

Dr. Salwa Elgendy had the responsibility of protocol drafting, reference search, data collection and data analysis, writing and final proof of the manuscript. Dr. Heba, Rasha, Ashraf, Ahmed, Ziyad helped in editing the manuscript, Gazal & Arwa participated in data collection, practical part of the study and statistical analysis of data.

CONFLICT OF INTREST

Not declared

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Limitations

Limited number of cases, and we applied our study only in male gender. In addition, we didn't apply the clinical part of the research ourselves, but we gathered the data from Dr. Mohammed Al Than, Head of the physiotherapy department, KAUH, who handled the cases himself due to a lot of official obstacles dealing with cases inside the physiotherapy department.

References

- [1]. Abrahm, J. L. (2014). A physician's guide to pain and symptom management in cancer patients. JHU Press; 2nd Edition: PP.118.
- [2]. Brian R. Mulligan (1999). Manual Therapy.4th edition: PP. 1.
- [3]. Codman E.A. (1934). The shoulder. Tomas Todd and Boston; PP. 216-224.
- [4]. Hammer W.I. (2006). Functional soft-tissue examination and treatment by manual method. Jones & Bartlett; 3rd edition: PP.124-125.
- [5]. Hand, C., Clipsham, K., Rees, J. L., & Carr, A. J. (2008). Long-term outcome of frozen shoulder. Journal of shoulder and elbow surgery, 17(2), 231-236. [Medline].
- [6]. Iannotti, J. P., & Williams, G. R. (Eds.). (2007). Disorders of the shoulder: diagnosis & management (Vol. 1). Lippincott Williams & Wilkins.2nd edition: PP.545-546.
- [7]. Karwowski W. (2006): International encyclopedia of ergonomics and human factors. CRC Press; 2nd Edition: PP.2752.
- [8]. McCarthy, C., & Dieppe, P. (1994). Taping the patella medially: a new treatment for osteoarthritis of the knee joint?. Bmj, 308(6931), 753-755.
- [9]. Michlovitz S.L.; Harris B.A. and Watkins M. P. (2004): Therapy interventions for improving joint range of motion: A systematic review. Journal of Hand Therapy; 17(2):118-31. [Medline]
- [10]. Miller, P., &Osmotherly, P. (2009). Does scapula taping facilitate recovery for shoulder impingement symptoms? A pilot randomized controlled trial. Journal of Manual & Manipulative Therapy, 17(1), 6E-13E.PHTY, P. T. M. (2016). THE EFFECTS OF MULLIGAN'S MOBILISATION WITH MOVEMENT ON SHOULDER PAIN AND DYSFUNCTION (Doctoral dissertation, Griffith University).
- [11]. PHTY, P. T. M. (2016). THE EFFECTS OF MULLIGAN'S MOBILISATION WITH MOVEMENT ON SHOULDER PAIN AND DYSFUNCTION (Doctoral dissertation, Griffith University).
- [12]. Resnick, D. (Ed.). (2002). Diagnosis of bone and joint disorders (Vol. 5). Saunders.
- [13]. Sawkins, K., Refshauge, K., Kilbreath, S., & Raymond, J. (2007). The placebo effect of ankle taping in ankle instability. Medicine & Science in Sports & Exercise, 39(5), 781-787.
- [14]. Shiers J. (2005). The Kinesio Taping Method: An Essential Tool. AMTA Florida Journal; Winter Issue #36: PP.23.
- [15]. Souza T.A. (2008). Differential diagnosis and management for the chiropractor. Jones & Bartlett, 4th Edition: PP.243.
- [16]. Tamai, K., Akutsu, M., & Yano, Y. (2014). Primary frozen shoulder: brief review of pathology and imaging abnormalities. Journal of Orthopaedic Science, 19(1), 1-5.
- [17]. Teys, P., Bisset, L., & Vicenzino, B. (2008). The initial effects of a Mulligan's mobilization with movement technique on range of movement and pressure pain threshold in pain-limited shoulders. Manual therapy, 13(1), 37-42.
- [18]. Thelen M.D.; Dauber J.A.; and Stoneman P.D. (2008): The clinical efficacy of kinesio tape for shoulder pain: A randomized, double-blinded trial. Journal of Orthopedics & Sport Physical Therapy JOSPT; 38:7.
- [19]. Tighe C.B. and Oakley W.J. (2008). The prevalence of adhesive capsulitis of the shoulder. South Medicine Journal; 101:591.
- [20]. Vicenzino B.; Brooksbank J.; Minto J.; Offord S. & Paungmali A. (2003). Initial effects of elbow taping on pain-free grip strength and pressure pain threshold. Journal of Orthopaedic & Sports Physical Therapy; 33(7):400-407.

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