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EFFECTIVENESS OF PHYSICAL THERAPY INTERVENTION IN ADHESIVE CAPSULITIS PATIENTS

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Abstract: *Adhesive Capsulitis is a condition of glenohumeral joint in which there is restriction of active and passive ROM in capsular pattern. External rotation and abduction ROM are mostly restricted followed by internal rotation and flexion ROM whereas extension is relatively free. Physiotherapy treatment is used in different shoulder pathology at initial stages and adhesive capsulitis is one of them. Purpose of this case report is to described the physical therapy intervention for a patient with adhesive capsulitis. The patient was 42 years old female came with left shoulder pain for last 3 months. Patient had medical history of type-II diabetes and patient had not any history of trauma. Diagnosis of the patient's condition as adhesive capsulitis based on the clinical evaluation following past medical history and other physical therapy examination and evaluation. Patient was treated for 4 weeks. Intervention included Myofascial technique and Maitland mobilization, Mulligan's mobilization and home exercise also prescribed. Home exercise protocol included with active ROM exercise, muscle strengthening and hot fomentation. Following 4 weeks of physiotherapeutic treatment, pain, ROM of shoulder joint. The study concludes that the combined approach of Myofascial technique along with Maitland mobilization and Mulligan's mobilization and home exercise program is beneficial in improving ROM, reduced pain and functional disability in patients with Adhesive Capsulitis.*

Introduction

Adhesive Capsulitis is a common condition of glenohumeral joint in which is characterized by pain and restriction of shoulder joint range of motion actively and passively in capsular pattern. In this condition, external rotation and abduction are mostly restricted followed by internal rotation and flexion whereas extension is relatively free. In Adhesive Capsulitis, etiology is still undefined which is characterized by painful and gradually progressive restricted joint motion.

In cases of Adhesive Capsulitis there are three stages and there are as follows – Freezing stage, Frozen stage, and Thawing stage. In the first stage or Freezing stage, the early inflammation and hyper-vascular synovitis is seen. In the second stage or Frozen stage, there is a decrease in hyper-vascularity and synovitis. However, capsular contraction and thickening is noted on arthroscopic evaluation. In the third stage or thawing stage, no synovitis is seen, and capsule is decreased. In this stage, the glenohumeral joint synovial capsule is also involved.

The outside structure of shoulder joint is also involved, including the coracohumeral ligament, rotator interval, subscapularis, musculotendinous unit and the subacromial bursae.

Epidemiology

Adhesive Capsulitis usually occurs individual elderly between 40-60 years, has a prevalence of approximately 2 to 5% in the general population. There is a lightly more significant

predominance in female (1.4:1) and the non-dominant hand is often affected.

Patients with autoimmune comorbidities, such as thyroid disorder and type-II diabetes, are more apt to developing adhesive capsulitis or frozen shoulder. A meta-analysis by Zreik concluded that 13.4% overall mean prevalence of adhesive capsulitis in diabetic patients, and a 30% mean prevalence of diabetes in a population with adhesive capsulitis.

A meta-analysis by Chuang et al found significantly higher rates of hypothyroidism and subclinical hypothyroidism in individual with adhesive capsulitis than in those without adhesive capsulitis.

Pathophysiology

The precise pathophysiology of adhesive capsulitis remains uncertain. The prevailing hypothesis suggests inflammation initiates within the joint capsule and synovial fluid, followed by reactive fibrosis and adhesions in the synovial lining. The initial inflammation o the capsule causes pain, while the capsular fibrosis and adhesions reduce the range of motion.

Symptoms and Clinical Presentation

In cases of adhesive capsulitis, patients will often complain about gradual onset with a continuing increase in pain and joint range of motion will also decrease gradually. One of the main presenting factors is reduced external rotation of shoulder joint. Patients also suffer with difficulty in daily living activities like grooming, dressing, performing overhead activities. In acute stage of this condition, sleep is often disturbed. As the patient's condition progresses, the pain get worse and patient suffers due to lack of sleep, pain and depression.

Treatment approaches

Coservative treatment: Oral medication, steroid injection and hydro-dilatation, physical therapy are commonly used as conservative treatment in adhesive capsulitis cases. In up to 90% cases early conservative treatment showed a successful result.

Medication: During the initial stages, treatment is primarily focused on pain management. Initially nonsteroidal anti-inflammatory drugs (NSAIDs) started, there are no confirm study to show the success of effectiveness of NSAIDS in adhesive capsulitis. Oral administration of corticosteroid is also used as a treatment of adhesive capsulitis. Significant improvements were found in those were treated with corticosteroid, for pain and functional outcomes at the 4 week follow up.

Physiotherapy: Physiotherapy as an initial treatment approach is mostly useful in many shoulder conditions including adhesive capsulitis. As a successful treatment approach, physiotherapy itself showed a positive result or in comparison with other conservative treatment approaches.

Corticosteroid injections: Corticosteroid injections are also often used to reduce painful synovitis and inflammation occurring within the shoulder. Many studies have been done and reviewed the comparison between the physical therapy approach and corticosteroid injection, but results have been incongruity. It has been concluded that corticosteroid injections provide significantly greater short-term benefits in pain relief.

Hydrodistension: Hydrodistension or hydro-dilatation has considered as a non-surgical option for the management of adhesive capsulitis. This technique includes, the installation of a steroid, local anaesthesia, large volume of saline and contrast agent into the glenohumeral joint under imaging guidance. This technique provides only short-term benefits in pain, ROM.

Manipulation under anaesthesia: This is reserved for refractory cases of adhesive capsulitis. It carries a risk of humerus fracture. The procedure involves gentle manipulation at joint in various directions. The patient's arm is supported by a small lever arm and the affected shoulder is gently manipulated in abduction, flexion, ext. rotation, and 90degree of abduction. Additionally, an injection of triamcinolone mixed with bupivacaine may be administered during manipulation to prevent inflammation.

Arthroscopic Capsular Release: Arthroscopic capsular release of joint is a most popular treatment method for non-responsive adhesive capsulitis patients.

Application of Myofascial Release Technique: Recent studies have examined the possible advantages of myofascial release technique or MFR technique or adhesive capsulitis patients. Most of the studies showed the efficacy of MFR technique in improving pain and ROM. MFR improves viscoelastic properties of affected muscles with trigger points and thus in turn improves the biomechanics of shoulder motion resulting in less pain and improved function.

Objectives: This case study's main goal is to evaluate the efficacy of MFR technique along with Maitland mobilization and Mulligan mobilization in a 4 weeks rehabilitation program to increase joint range of motion and lessen pain in patient with Frozen Shoulder.

CASE PRESENTATION

Patient Information: A 42 years old female patient presented with left shoulder pain and limited ROM. The patient's chief complaints were pain, decreased ROM and difficulty in activities of daily lives like dressing, bathing, combing etc. patient had a past medical history of type-II diabetes.

Clinical Findings and Assessment: On examination, the patient exhibited tenderness over lateral aspect of arm, subscapularis muscle, infraspinatus muscle, latissimus dorsi muscle, trapezius muscle and pectoralis muscle reduced shoulder joint range of motion, both indicated to frozen shoulder of left shoulder. Pain intensity was rated as 7 out of 10 on the Visual Analogue Scale (VAS) during activities. Initial evaluation of patient's affected shoulder joint range of motion was as follows- shoulder flexion – 110˚, shoulder abduction-100˚, shoulder internal rotation – 30˚, shoulder external rotation – 35˚, and muscle strength of affected shoulder was as follows-shoulder flexor – (4-), shoulder extensor – (4+), shoulder abduction – (3+), shoulder adduction – (4+), shoulder internal rotation – (4-), shoulder external rotation – (4-).

METHODS

Intervention: The patient was enrolled in a 4 weeks physiotherapy rehabilitation program including MFR technique, Maitland mobilization, Mulligan mobilization. The program was conducted by a certified physical therapist trained in MFR technique, Maitland mobilization technique and Mulligan mobilization technique. The intervention involved home

exercise program performed weekly 5 times by the patient. Each session lasted approximately 30 minutes and included the following components:

MFR application: A sustained, gentle pressure was applied by the therapist over the trigger points on affected muscles such as subscapularis, infraspinatus, pectoralis, latissimus dorsi and trapezius.

Exercise Protocol:

Maitland mobilization: Maitland mobilization of glenohumeral joint including anteroposterior glide, grade-III-IV and caudal glide, grade III-IV and posteroanterior glide, grade III-IV and for acromioclavicular joint, sternoclavicular joint and scapulothoracic joint, grade III-IV was performed, 3 sets of 10-12 repetition.

Mulligan mobilization: Mulligan's mobilization included movement with mobilization with Mulligan belt for flexion, Int. rotation and Ext. rotation was performed by the therapist for 3 sets of 10-12 repetition.

Rest Intervals: A 30-seconds rest was provided between sets.

Outcome Measures: The primary outcome were ROM and pain measured at baseline and post-intervention.

Visual Analogue Scale (VAS): Pain intensity was rated by the patient during shoulder movement activities. The VAS is a 10cm scale where 0 represent no pain and 10 represents the worst possible pain.

Mobility such as active and passive ROM of shoulder flexion, abduction and ration is measured by using goniometer in degrees. Goniometer range of motion measurements for the shoulder appears to be highly reliable.

RESULTS

VAS: The patient showed a notable reduction in VAS score after the 4-week treatment program including, MFR technique program, Maitland mobilization and Mulligan's Mobilization. The pre intervention VAS score was 7 out of 10 and the post-intervention 3 out of 10. The patient reported a substantial reduction in pain during activities involving shoulder flexion, abduction, int. rotation and ext. rotation which contributed to the overall improvement in function and quality of daily life.

ROM: The patient showed a notable improvement in ROM measuring by goniometer after the 4week rehabilitation program such as, shoulder flexion – 150˚, shoulder abduction – 135˚, shoulder internal rotation – 60˚, shoulder external rotation – 70˚.

DISCUSSION

Adhesive Capsulitis is condition of glenohumeral joint in which there is restriction of active and passive ROM in capsular pattern. Ext. rotation and abduction are mostly restricted and int. rotation and flexion ROM is also reduced and painful whereas extension is relatively painless. The etiology of adhesive capsulitis is still unknown which is clinically featured by painful and gradually progressive restriction of joint range of motion. In cases of adhesive capsulitis there are three stages called as the first stage or the freezing stage, the second stage or the frozen stage and the third stage or the thawing stage.

Patient was treated for 4 weeks with the combined approach of MFR technique, Maitland mobilization technique, Mulligan's mobilization technique and home exercise program. After 4 week the pain significantly decreased, ROM and muscle strength improved. The suggested processes by which MFR technique improves joint range of motion and reduces pain are in line with the notable improvements seen in this present case study. MFR technique helps to elongate and soften the fascia, thereby improving ROM reducing pain by releasing tension in the muscles and connective tissues that are contributing to the joint stiffness. In this study MFR technique along with Maitland mobilization and Mulligan's mobilization showed a significant improving ROM and reducing pain.

One of the case study's most significant result is decreased pain intensity as measured by Visual Analogue Scale. Significant functional limits are frequently caused by adhesive capsulitis, especially when doing overhead activities or lifting obs. Given the patient notable result in VAS scores and goniometer measurements.

Although this case study's findings are promising, it is important to recognize its short-comings. First, the results might not be very much effective to the larger community of people with adhesive capsulitis because of this study is based on single subject approach. The favorable results in this study might have been influenced by the patient's relative youth and level of patient's relative youth and level of physical activity. Furthermore, the absence of a control group in the study made it challenging to attribute to benefits exclusively to MFR technique.

In order to ascertain the effectiveness of MFR technique in a more varied population, future studies showed attempt to overcome these constraints by accomplishing randomized controlled trials (RCTs) with bigger ample size.

CONCLUSION

The effectiveness of Myofascial technique along with Maitland mobilization and Mulligan's mobilization as a useful treatment for improving range of motion, functional activity and reducing pain in a patient with adhesive capsulitis is demonstrated in this case study. MFR technique might be a good substitute along with Maitland mobilization and Mulligan's mobilization for conventional physical therapy treatment methods, for those patients who have not responded to standard therapy approaches, as seen by the case's significantly reduced pain and improving ROM. To validate these results and investigate the wider uses of MFR technique in the rehabilitation of adhesive capsulitis and other musculoskeletal disorders, more investigation is necessary.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

REFERENCE

1.Mohanty PP, Pattnaik M. Physiotherapy of the shoulder.

2.Hsu JE, Anakwenze OA, Warrender WJ, Abboud JA. Current review of adhesive capsulitis. Journal of shoulder and elbow surgery. 2011 Apr 1;20(3):502-14.

3.Zreik NH, Malik RA, Charalambous CP. Adhesive capsulitis of the shoulder and diabetes: a meta- analysis of prevalence. Muscles, ligaments and tendons journal. 2016 Jan;6(1):26.

4.Chuang SH, Chen YP, Huang SW, Kuo YJ. Association between adhesive capsulitis and thyroid disease: a meta-analysis. Journal of Shoulder and Elbow Surgery. 2023 Jun

1;32(6):1314-22.

5.Dias R, Cutts S, Massoud S. Frozen shoulder. Bmj. 2005 Dec 15;331(7530):1453-6.

6.Kelley MJ, Mcclure PW, Leggin BG. Frozen shoulder: evidence and a proposed model guiding rehabilitation. Journal of orthopaedic & sports physical therapy. 2009 Feb;39(2):135-48.

7.Jewell DV, Riddle DL, Thacker LR. Interventions associated with an increased or decreased likelihood of pain reduction and improved function in patients with adhesive capsulitis: a retrospective cohort study. Physical therapy. 2009 May 1;89(5):419-29.

8.Cleland J, Durall CJ. Physical therapy for adhesive capsulitis: systematic review. Physiotherapy. 2002 Aug 1;88(8):450-7.

9.Levine WN, Kashyap CP, Bak SF, Ahmad CS, Blaine TA, Bigliani LU. Nonoperative management of idiopathic adhesive capsulitis. Journal of shoulder and elbow surgery. 2007 Sep 1;16(5):569-73.

10.Bulgen DY, Binder AI, Hazleman BL, Dutton J, Roberts S. Frozen shoulder:

11. prospective clinical study with an evaluation of three treatment regimens. Annals of the rheumatic diseases. 1984 Jun 1;43(3):353-60.

12.Lorbach O, Anagnostakos K, Scherf C, Seil R, Kohn D, Pape D. Nonoperative management of adhesive capsulitis of the shoulder: oral cortisone application versus intra-articular cortisone injections. Journal of shoulder and elbow surgery. 2010 Mar 1;19(2):172-9.

13.Griggs SM, Ahn A, Green A. Idiopathic adhesive capsulitis: a prospective functional outcome study of nonoperative treatment. JBJS. 2000 Oct 1;82(10):1398.

14.Sun Y, Lu S, Zhang P, Wang Z, Chen J. Steroid injection versus physiotherapy for patients with adhesive capsulitis of the shoulder: a PRIMSA systematic review and meta-analysis of randomized controlled trials. Medicine. 2016 May 1;95(20):e3469.

15.Bal A, Eksioglu E, Gulec B, Aydog E, Gurcay E, Cakci A. Effectiveness of corticosteroid injection in adhesive capsulitis. Clinical Rehabilitation. 2008 Jun;22(6):503-12.

16.Blanchard V, Barr S, Cerisola FL. The effectiveness of corticosteroid injections compared with physiotherapeutic interventions for adhesive capsulitis: a systematic review. Physiotherapy. 2010 Jun 1;96(2):95-107.

17.Buchbinder R, Green S, Youd JM, Johnston RV, Cumpston M, Cochrane Musculoskeletal Group. Arthrographic distension for adhesive capsulitis (frozen shoulder). Cochrane Database of Systematic Reviews. 1996 Sep 1;2010(1).

18.Melzer C, Hoffmann S, Wallny T, Wirth CJ. Frozen shoulder—treatment and results. Archives of orthopaedic and trauma surgery. 1995 Feb;114:87-91.

19.Brue S, Valentin A, Forssblad M, Werner S, Mikkelsen C, Cerulli G. Idiopathic adhesive capsulitis of the shoulder: a review. Knee Surgery, Sports Traumatology, Arthroscopy. 2007 Aug;15(8):1048-54.

20.Neviaser AS, Hannafin JA. Adhesive capsulitis: a review of current treatment. The American journal of sports medicine. 2010 Nov;38(11):2346-56.

21.Roy A. Efficacy of Myofascial Release with Mobilization in patient with Frozen Shoulder.

22.Sinha U, Sarkar B, Kumar P. Effectiveness of scapular mobilization versus myofascial release of subscapularis on pain, ROM and function in subjects with chronic frozen shoulder: a comparative study. mechanics. 2019;5:11.