



EFFECT OF PHYSIOTHERAPY REHABILITATION PROTOCOL ON ADHESIVE CAPSULITIS: A CASE STUDY

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ABSTRACT

Objective: To determine the effectiveness of physiotherapy Rehabilitation protocol in patients with Adhesive Capsulitis.

Materials and Method: A rehabilitation protocol was followed to treat diagnosed Adhesive Capsulitis patient.

Result: In this study, decrease pain, improvement in range of motion and able to do activities of daily living after giving Physiotherapy Rehabilitation.

Conclusion: this study concluded that Various therapeutic techniques like hot packs, Therapeutic ultrasound, capsular stretches, strengthening exercises and home regime have a significant effect in reducing pain, increasing range of motion and stiffness of joints in Adhesive Capsulitis.

Keywords: Adhesive Capsulitis, Frozen Shoulder, Physiotherapy Rehabilitation Protocol.

INTRODUCTION

Adhesive Capsulitis of shoulder is also termed as Frozen Shoulder, stiff painful shoulder, or periarthritis is a common cause of shoulder pain is a common cause of shoulder pain. It is estimated to affect 10-15% of the general population.¹ Adhesive Capsulitis is a rheumatological enigma.² It affects the glenohumeral joint, possibly involving a non-specific chronic inflammatory reaction, mainly of the sub synovial tissue, resulting in capsular and synovial thickening. Adhesive Capsulitis is used to denote a limitation of shoulder motion without abnormalities of the joint surface. The onset of Adhesive Capsulitis is usually gradual and idiopathic. The disease occurs mainly in middle aged individuals and is usually self-limiting but the duration and severity may vary greatly.³ Most studies have suggested a self-limiting condition lasting an average of two to three years, although significant numbers of people have residual clinically detectable restriction of movement beyond three years and smaller numbers have residual disability.¹

J.S. Naviaser coined the term 'adhesive capsulitis' in 1945. He found dense adhesions and capsular contractures causing in restriction of motion, intra-articular pain and microscopic evidence of reparative inflammatory changes in the glenohumeral joint capsule. Some author suggests an autoimmune phenomenon. Others have suggested the condition is a variant of sympathetic reflex dystrophy. However, patients generally do not improve after what is probably the most effective treatment for sympathetic reflex probably the most clinically useful classification of the Adhesive Capsulitis defines primary and secondary forms. In the primary form, no other identifiable systemic condition or local shoulder disease explains the patient's pain and loss of range of motion. Most of the literature on diagnosis and treatment refers to the primary form. In the secondary form, a predisposing condition usually is associated with the patient's pain and loss of movement. Patients

with hemi paresis from a stroke or other upper motor neuron lesion frequently develop a secondary Frozen Shoulder. Frozen Shoulder might coexist with other local shoulder disorders, such as impingement syndrome. Other predisposing conditions include cervical spondylosis, recent thoracic surgery, thoracic (such as a Pancoast tumour), and coronary artery disease.⁵ Information on the treatment and prognosis of frozen shoulder is inadequate and based largely on individual practice experience rather than randomized controlled clinical trials. There is as yet no definitive agreement on the most effective form of treatment. Initial treatment is aimed at reducing inflammation and increasing range of motion. Thus analgesic and anti-inflammatory drugs are commonly used. Most type of treatment focus primarily on restoration of mobility. Although physical therapies such as massage, heat application, ultrasound, interferential treatment, osteopathic, chiropractic techniques and stretching and isometric exercise therapy are routinely prescribed, the efficacy is variable. Controversial results are reported with manipulation under anaesthesia, distension arthrography, and arthroscopic surgery. In osteoporotic or postsurgical frozen shoulder, an open release with lysis of adhesions and capsule release is recommended. Intra-articular corticosteroid injection and suprascapular nerve block have also been strongly advocated. Metaanalysis of randomized controlled trials evaluating interventions for painful shoulder from 1966 to 1995, however, failed to find evidence to support or refute the efficacy of these interventions. Acupuncture has been reported to be effective for the treatment of frozen shoulder or shoulder arthritis. Hansen reported that⁵ minute acupuncture treatment sessions were equally as effective for neck and shoulder pain when compared with 20 minute sessions. However, there was an imbalance between the groups studied in terms of the pretreatment visual analogue score, and this combined with the limited trial size suggested these results may not be reliable.⁴ Manipulation under anaesthesia combined with early physiotherapy alleviates shoulder pain and facilitates of shoulder function in patients with frozen shoulder syndrome. Conservative management strategies for frozen shoulder frequently include combination of varied types of interventions such as rest, medications, acupuncture, physical agents, postural or ergonomic advice, slings and range of motion exercise programs. Therapy includes manual therapy; ROM exercises, specific stretching and strengthening exercises and aerobic program and modalities are available such as interferential therapy, ultrasound, and hot therapy. There is no doubt that physiotherapy treatment is promising and cost effective treatment option and aimed at relieving the pressure on nerves causing the inflammation and pain. This present study is done on patients' diagnosed frozen shoulder with a physiotherapy treatment protocol.

RELEVANT ANATOMY, ETIOLOGY AND PATHOLOGY OF SHOULDER

The shoulder is a complex, ball and socket synovial joint, composed of the humerus, scapula and the clavicle. The labrum is a ring cartilage that surrounds and deepens the glenoid cavity of the scapula. The resting position of the glenohumeral joint is 55° of abduction and 30° of horizontal adduction. What makes the shoulder unique among all the joints of the body is that its support, stability and integrity depend on muscles rather than bones and ligaments. However recent studies have shown that it is the group of muscles known as the rotator cuff that is most commonly involved in myofascial pathologies of the shoulder. The rotator cuff muscle group is comprised of the supraspinatus, infraspinatus, teres minor and subscapularis muscles. According to Klab, 95% of all cases of shoulder pain are a to the tendons of the rotator cuff becoming impinged between the greater tuberosity of the humerus and the anterior edge of acromion, especially during motions that positions the arm above the head. Thus, impingement syndromes are the most frequent type of shoulder pathology and often the result of the cumulative effect of the rotator cuff tendons constantly passing under the acromion hood.⁶

ETIOLOGY

The etiology of the frozen shoulder remains unknown. Lundburg and helbig et al proposed primary and secondary classifications for cases that occur spontaneous and for those that results trauma. The primary, idiopathic cases are the most common and the least understood. The unknown stimulus produces profound histological changes in the capsule that are substantially different from changes produced by immobilization and degeneration. Secondary frozen shoulder commonly develops after a variety of antecedent episodes, such as central nervous system involvement, upper limb immobilization, and trauma to the arm, pulmonary cancer or infection, myocardial infarction, lengthy duration of intravenous infusion, cervical disk disease, rheumatoid arthritis, or diabetes mellitus. Quigley hypothesized that minor trauma or an episode of inflammation may produce pain, which eventually leads to disuse and the classical restriction of motion characterizing frozen

shoulder. Lloyd and Lloyd suggested that secondary frozen shoulder develops when painful spasm limits activity and creates dependency of the arm.

PATHOLOGY

Features of this pathologic condition include chronic capsular inflammation with fibrosis and perivascular infiltration. Although several researchers found no evidence of inflammation, they concurred that fibrosis exists in the capsule. Chronic cases of frozen shoulder demonstrate constrictive capsulitis, characterized by adhesions of synovial folds; obliteration of the joint cavity; and a thickened, contracted capsule that eventually becomes fixed to the bone.⁷

BIOMECHANICS OF SHOULDER JOINT

Complex shoulder joint is comprised of mainly three joint glenohumeral joint, sternoclavicular joint and acromioclavicular joint. The coordinating movement of these joint during arm movement is referred to as scapulohumeral rhythm. Inman and Colleagues in 1944 showed the kinematics of the shoulder abduction, occurring at a ratio of 2:1. a full arc of 180° of shoulder abduction is the result of a simultaneous 120° of glenohumeral joint abduction and 60° of scapulothoracic upward rotation. Stage 1 includes Glenohumeral movement alone for first 30°, inferior angle of scapula should not move and Clavicle elevate 5°. Stage 2 includes Scapular elevation and upward rotation (20°) point glenoid cavity towards the ceiling humeral head glides inferiorly by 90° revealing a sulcus. Stage 3 includes 60° degree abduction, 90° degree lateral rotation of humerus, 30° rotation of scapula and 30-50° rotation up to 15° degree elevation of clavicle.⁸

DIAGNOSIS

The natural history of frozen shoulder follows a classic cycle of “freezing”, “frozen”, and “thawing”. There is an acute onset of pain that often worsens during the first weeks or months. The pain of frozen shoulder is present during both activity and rest, resulting in long term sleep disturbances. Arm movement of the shoulder also aggravates the symptoms. Limitation of the shoulder motion is the frequent symptom. Motion is guarded, and the arm is held against the body with the shoulder adducted and medially rotated. Functional activities that requires overhead reaching or behind the back may be difficult or impossible because of pain. Disuse atrophy may be evident in the rotator cuff. Capsular contractures limit the range and thus, produce a capsular end feel⁷. Both Yergason’s test¹¹ (resisted forearm supination with elbow flexed to 90°) and Speed’s test¹² (resisted shoulder forward flexion) are often positive. Other pathologies commonly found in the shoulder involve the muscles or tendons of supraspinatus, subscapularis and deltoid. These can be differentiated by the Empty can test (resisted abduction with arm at 90° abduction and medial rotation) and Lift-off sign (patient asked to lift hand off his or her lower back) and drop-arm test respectively.¹³

MANAGEMENT

Many treatments have been advocated for frozen shoulder. The existence of so many different treatments, each with its own group of enthusiastic supporters, suggests that no single treatment is unequivocally superior to others. The fundamental goal of treatment is to restore and maintain function. Corticosteroid injections have long advocated for treating frozen shoulder joint, into the adjacent soft tissues, or into the subacromial bursa¹. Many studies have included early mobilization and gentle range of motion exercises should be part of managing all patients with shoulder dysfunction. Exercise should be two types stretching exercises to prevent further loss of range of motion and promote faster return to normal range, and strengthening. A physiotherapist’s most useful role is in patient education and instruction in appropriate exercise to prevent loss of further range and strength⁵. Among all the above treatments physiotherapy play a significant role in the treatment of frozen shoulder. After through assessment physiotherapy rehabilitation protocol was given to the patients. The protocol is as follows⁴.

PHYSIOTHERAPY MANAGEMENT (15 SESSIONS WERE GIVEN)**DAY 1-5**

- Hot packs for 15 minutes so as to relax the muscles around shoulder complex.
- Ultrasonic therapy: 0.8 was with 1 MHz frequency probe for 10 minutes for breaking the adhesions as well as relieving pain.
- Shoulder joint capsule stretching (4 times) GH Caudal glides (4sets of 10 rep. each)
- GH Posterior glides (4 sets of 10 rep. each)
- Long axis traction of glenohumeral joint (5 mins)
- Passive movements
- Finger ladder exercise, Shoulder wheel exercise for 15 minutes
- Home regime
- Hot water fomentation
- Pendular exercises
- Wall finger climbing exercises
- Self assisted exercise.

DAY 6-10: Exercises are same while number of repetitions is increased

- Shoulder joint capsule stretching (6 times)
- GH Caudal glides (6 sets of 10 rep. each till end range)
- GH Posterior glides (6 sets of 10 rep. each till end range)
- Long axis traction of glenohumeral joint (7 times)
- Hold relax exercises (7 repts)
- Resisted exercises in available range are added (10 repts)

DAY 11-15: Exercises are kept same and the numbers of repetitions are increased.

- Hold relax exercise (10 repts)
- Resisted exercises in available range are added (15 repts)

PROCEDURE

5 patients (3 females 2 males) diagnosed case of frozen shoulder were randomly included in the study.

They were assessed by a fixed assessment protocol prior to the commencement of the study. Subjects included whom had Painful, restricted active and passive range of motion of the shoulder, symptoms present for at least 1 month, absence of radiological evidence of glenohumeral joint arthritis and had capsular pattern of motion restriction. Subjects were excluded if any subject had taken local corticosteroid therapy currently and within the last 3 months, and had history of any neuromuscular diseases, Pregnancy and diagnosis of cancer within 12 months¹⁰.

DISCUSSION

Frozen shoulder is often diagnosed and managed. This is partially due to a lack of agreement about definitions and classification of this disorder, confusing terminology and difficulty differentiating it from other conditions. The frozen shoulder is characterized by an unknown etiology, spontaneous and gradual onset of pain and a global restriction of movement in the GH joint due to contractures and loss of compliance of the

capsule. While the etiology is typically unknown, there can be a history of minor trauma and occasional significant injury. An important component of successful management of frozen shoulder syndrome is educating patients and informing them about the planned treatment modalities. Objectives of physiotherapy and rehabilitation applications in patients with frozen shoulder are to prevent disability, to increase functional capacity, and to provide pain relief. In this study five cases of frozen shoulder were taken, 3 females and 2 males. The age of patients were ranging from 35-60 years. All of them suffered from global restriction of movements and pain in the shoulder region. Patients also displayed a feature of nocturnal pain in common. A standardized assessment performa was used to assess the patient. Case 1 presented with pain and stiffness in left shoulder, global restriction of movements and difficulty in ADL's. VAS score was 7 before treatment and after physiotherapy treatment reduced to 3. Pain reduced and also stiffness in joint was reduced. She was able to activities of daily living. Case 2 presented with pain and stiffness in right shoulder, nocturnal pain, and restriction of movements. VAS score was 8 before treatment and after physiotherapy treatment was reduced to 4. Pain was reduced and also the stiffness in joint, range of motion increased. Case 3 presented with pain and stiffness in shoulder, nocturnal pain and global restriction of movements. VAS score before treatment was 8 and after physiotherapy treatment were 5. Joint stiffness was reduced and patient was able to do activities of daily living. Case 4 presented with pain and stiffness in shoulder, severe pain during sideways lifting, diabetic and history of trauma was there. VAS score before treatment was 8 and after physiotherapy treatment was reduced to 4. Pain was reduced, improved range of motion and he was able to do activities of daily living. Case 5 presented with stiffness and pain in shoulder, limitation of overhead and sideways movements, nocturnal pain. VAS scale before treatment was 7 and after physiotherapy treatment were 3 and reduction in pain, improvement in range of motion and able to do activities of daily living. All the patients were given physiotherapy treatment according to the condition for example ultrasound, hot packs, shoulder mobilization, capsule stretching, strengthening exercises for weak muscles and pain relief. Prognosis was found to be very effective after physiotherapy treatment.

CONCLUSION

The cases studied shows that physiotherapy plays an important role in treatment of patients suffering from frozen shoulder. Various therapeutic techniques like hot packs, ultrasound, capsular stretches, strengthening exercises and home regime have a significant effect in reducing pain, increasing range of motion and stiffness of joints in frozen shoulder. Acknowledgement: The authors are thankful to subjects who participated in this study to carry out this work. Source of Funding: The work done in the study has not been supported by any funding agency or supported by a grant and it has not been adapted from a conference presentation. Conflict of Interest: There was no conflict of interest.

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