PHYSICAL THERAPY & MAITLAND’S MANUAL JOINT MOBILIZATION TECHNIQUES (GRADE II & III) ARE EFFECTIVE TO MANAGE THE STAGE I ADHESIVE CAPSULITIS

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Abstract
Secondary adhesive capsulitis or frozen shoulder is a common entity in general population. It is a common cause of shoulder pain and disability. Although it is a self limiting illness, its rather long, restrictive and painful course forces the affected person to seek treatment. Conservative management remains the basic treatment of adhesive capsulitis. This includes Physical therapy management of the shoulder, electro therapeutic modalities, manual mobilization, exercise, soft tissue therapy, nonsteroidal anti-inflammatory drugs, and steroid injections. Manipulation under anesthesia is done when the conservative treatment fails. A case of secondary adhesive capsulitis in a thirty nine years old male hawker is presented to illustrate clinical presentation, diagnosis, radiographic assessment and conservative chiropractic management. The patient’s right shoulder range of motion was full and pain free with three weeks of physical therapy & manual therapy management.

Keywords: Physical Therapy ; Maitland’s Manual ; Joint Mobilization Techniques ; Effective Manage ; Stage I Adhesive Capsulitis

Introduction;
Adhesive Capsulitis is one of the most common causes of shoulder pain and disability in the general population. However, it is an uncommon entity in athletes. There is no report of frozen shoulder syndrome as a result of squash injury in the literature. The incidence of adhesive Capsulitis in the general population is 2–5% and10–20% in diabetics. It affects females slightly more than males and is usually seen in ages 40–70. The non dominant arm is more likely to be affected. About 12% of individuals affected develop the condition bilaterally. Recurrence is rare in the same shoulder. Adhesive capsulitis is also called, frozen shoulder syndrome, periartricular adhesions, pericapsulitis, irritative capsulitis, periarthritis of the shoulder, scapulohumeral periartrosis, humeroscapular fibrosis, bursitis calcarea, Duplay’s syndrome, shoulder portion of shoulder-hand syndrome, and stiff and painful shoulder. The frozen shoulder was first described as periarthritis involving the periartricular soft tissues of the shoulder by Duplay in 1872. Codman coined the term “frozen shoulder” in 1934. He described the frozen shoulder as “difficult to define, difficult to treat, and difficult to explain.” J.S. Naviaser coined the term “adhesive capsulitis” in 1945. He found dense adhesions and capsular contractures causing restriction of motion, intraarticular pain, and microscopic evidence of reparative inflammatory changes in the glenohumeral joint capsule. T.J. Naviaser did arthroscopic examination on many patients with frozen shoulder and described four stages arthroscopically as pre-adhesive, synovitis, maturation and the chronic stage. The etiology of adhesive Capsulitis remains unknown. However, rotator cuff disease, impingement syndrome, chest or breast surgery, diabetes, prolonged immobilization, age, thyroid disease, various medical problems (pulmonary disease, myocardial infarction,
cerebrovascular accident), and autoimmune disease are associated with the development of adhesive capsulitis. The idiopathic adhesive capsulitis symptoms have been divided into three phases clinically: (I) the painful phase, (II) the stiffening phase, and (III) the thawing phase. Adhesive capsulitis may complete its course in 12–42 months, but it may be as early as 6 months or as late as 10 years. Manual mobilization techniques for the shoulder joint remain the mainstay treatment of the frozen shoulder.

A case report is presented to illustrate clinical presentation, etiology, diagnosis, radiological assessment and conservative chiropractic management of a secondary adhesive Capsulitis in a middle age male hawker.

**Case report**

A thirty nine year old male hawker presented with right shoulder pain. Pain had started in the right shoulder joint after road traffic accident three months before. At that time, he saw an orthopedic surgeon who gave him anti-inflammatory medications. In spite of continuation of his treatment, pain and inability to move his right shoulder got worse. At this time the patient presented to the Physical therapy’s clinic with dull and achy pain in the right shoulder. He complained of not being able to move his right arm and having a hard time dressing and washing himself. The pain was aggravated by any movement of the right arm, lying on the right arm and he was awakened at night when he rolled onto the affected arm. The pain was slightly relieved by taking hot showers.

On examination, patient’s right glenohumeral joint active ranges of motion (ROM) were: internal rotation 45 degrees, external rotation 40 degrees, forward flexion 60 degrees, extension 30 degrees and abduction 40 degrees. The resisted right glenohumeral joint flexion, abduction, internal and external rotations were graded 3+/5. The right glenohumeral joint passive ROM was 5 degrees more in each direction. Posterior and postero-inferior joint play of the right glenohumeral joint was restricted and painful. His right deltoid, subscapularis, infraspinatus, supraspinatus and teres minor were hypertonic and tender upon palpation. There was severe point tenderness over the right deltoid tubercle. The right shoulder radiographs were unremarkable. A clinical diagnosis of the right adhesive capsulitis was made on the basis of patient’s history, complaint and physical examination.

Initial treatment consisted of Phonophoresis (Ultrasonic therapy with voltral emulgel), Moist hot pack, Maitland’s Grade I, II & III distraction mobilization, pendular home exercises for the right shoulder, soft tissue mobilization three times per week for three weeks. Manual mobilization started with Maitland’s grade I & II mobilization and then progressed to grade III mobilization. At the sixth visit, the active right glenohumeral (initial range in brackets) abduction, flexion and external rotation were 60 (40), 80 (60) and 65 (40) degrees respectively. However, the passive ROM showed even more improvements where the passive abduction, flexion and external rotation were 65, 85 and 70 degrees respectively. At this point, strengthening exercises using rubber tubing including external rotation, forward flexion and abduction were introduced. Manual mobilization techniques were administer Initially at the right glenohumeral joint tender point therapy and soft tissue release techniques over the hypertonic and tender muscles were started. Tender point therapy was also done by exerting digital compressive pressure over the tender points palpated in the involved muscles. This pressure was judged to the patient’s tolerance and was sustained until the patient reported the indulgence of the pain. The soft tissue release techniques were done utilizing digital longitudinal tension along the involved muscle fibers. Starting at the shortest position of the muscle, the patient actively moves toward the lengthened position of the muscle while the tension is sustained by the physical therapist. This course of treatment was administered three times a week for three weeks. At the end of this course of treatment, the patient’s right glenohumeral active abduction was 100 degrees and her flexion and external rotation were
full. The right glenohumeral passive abduction was full but the resisted remained 3+/5. The patient was assessed for isotonic strengthening exercises using free weights. A regimen of weight training exercises (isotonic) for shoulder abduction, forward flexion, extension, internal and external rotations three times per week for three week were suggested. In second week, the Phonophoresis was changed to moist hot pack to promote healing. At the end of the third week’s treatment, the patient had pain free full range of motion. (Table 1)

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<th>ROM (in degrees) with treatment</th>
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<td></td>
<td>Abduction</td>
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<td><strong>Initial</strong></td>
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<tr>
<td>Active</td>
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<td>Passive</td>
<td>45</td>
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<td><strong>End of 2nd week</strong></td>
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<td>Active</td>
<td>60</td>
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<td>Passive</td>
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**Discussion**

Lundberg classified patients suffering from frozen shoulder syndrome into “primary” and “secondary”. Primary adhesive capsulitis pertains to those patients who present with no significant findings in the history, clinical examination, or radiographic evaluation to explain their motion loss and pain. However, patients with secondary adhesive capsulitis disclose a trauma or surgery to the affected upper extremity prior to their shoulder symptomatology. The client in this case report is classified as secondary adhesive capsulitis because of history of fall. Reeves identified three phases in the natural history of the frozen shoulder syndrome: (I) an early painful phase lasting 10–36 weeks; (II) an intermediate, stiff or frozen phase characterized mainly by limited range of motion lasting 4–12 months; (III) a recovery or thawing phase lasting 5–24 months or more. Our client was in phase one at his visit to our clinic. However, the history usually indicates a gradual onset of stiffness and pain. The pain is quite intense and is often referred to the insertion of the deltoid, the deltoid muscle region and the bicipital tendon. The pain is aggravated by the shoulder movements, especially external rotation, and sleeping on the involved side, and is relieved by limiting the use of the extremity. There is often soreness in the proximal upper back and neck which may be as a result of compensatory overuse of the accessory musculature (trapezius, scalene, levator scapulae, and rhomboid muscles). The patient may complain of difficulty putting on a coat, reaching into the hip pocket for a wallet, combing his or her hair, and inability to fasten garments behind the back. These symptoms closely resemble the client in this case. Some authors state that
observation reveals guarded shoulder movements.\textsuperscript{(15)} At rest, the patient holds the involved arm in adduction and internal rotation.\textsuperscript{(16)}

The arm swing in gait is usually limited or absent.\textsuperscript{(12)} Rounded shoulders, stooped posture with the involved shoulder elevated in a protective manner are commonly seen in these patients\textsuperscript{(18)}.

Because of this altered posture, pain and trigger points often develop over the posterior aspect of the shoulder, along the upper trapezius, and in the posterior cervical region.\textsuperscript{(17)}

Disuse atrophy may be seen in the rotator cuff, deltoid, biceps and triceps brachii muscles.\textsuperscript{(10)}

The active and passive glenohumeral ROM are restricted.\textsuperscript{(15, 16)} This limitation of ROM is characteristic of a capsular pattern; that is, external rotation is limited more than abduction, which is restricted more than internal rotation\textsuperscript{(16)}. In addition, forward flexion is also limited in patients with adhesive capsulitis. Naviaser and Naviaser stated: “At the limits of motion there is a sense of mechanical blockage or tethering of the joint rather than resistance because of pain.”\textsuperscript{(8)} Hence, it is not the patient resisting the motion because of the pain but rather there is a mechanical blockage (especially in passive ROM) that limits the motion. Anterior, inferior glides and lateral distraction of the humerus on the glenoid are also restricted.\textsuperscript{(17, 18)}

These joint play findings confirm the mechanical blockage which is the glenohumeral capsular adhesions. These signs match the findings in our client except for glenohumeral anterior glide restriction.

Many shoulder orthopedic tests may be done to exclude other causes of a painful and stiff shoulder. However, these tests may lose their sensitivity and specificity because of the global shoulder pain and limited range of motion associated with adhesive capsulitis\textsuperscript{(20)}.

It is the author’s opinion that the sense of mechanical block of the joints at the end of the passive ROM is the most significant physical finding. Radiographic examination of the shoulder is required in the patients with adhesive capsulitis to exclude other conditions.\textsuperscript{(5, 8, 12, 19)}

Plain x-rays of these shoulders ranges from normal to osteopenic with degenerative changes, calcium deposits, or cystic changes in long-standing cases.\textsuperscript{(12)}

The shoulder radiographs in our client were normal. Pearsall and Speer recommend anteroposterior (AP), axillary and supraspinatus outlet views of the affected shoulder.\textsuperscript{(14)}

The AP film is assessed for osteopenia, bony abnormalities and superior migration of the head of the humerus. The axillary view is obtained to assess glenohumeral subluxation or glenoid or humeral head articular damage. Finally, the supraspinatus outlet film is scrutinized for supraspinatus outlet narrowing characterizing acromial impingement.\textsuperscript{(8)}

This view was not taken in our client. Bone scans may show increased uptake in the affected shoulder; often a nonspecific finding\textsuperscript{(6, 18, 21)}.

Shoulder arthrography shows loss of the normal axillary recess and a significantly decreased capsular volume\textsuperscript{(9)}. Although arthrography might be helpful, it is an invasive procedure that is painful and costly\textsuperscript{(17)}.

MRI can be a better choice since it is not invasive and the MRI examination of the frozen shoulder in comparison to the normal shoulder shows thickened joint capsule and synovial.\textsuperscript{(21)}

Many therapeutic regimens have been advocated for adhesive Capsulitis. These include: TENS, interferential current therapy, therapeutic ultrasound, utilization of heat and ice, shoulder mobilization, manipulation of the neck and shoulder using activator, trigger point therapy, exercise therapy, anti-inflammatory medications, corticosteroid injections, arthrographic infiltration, and manipulation under anesthesia.\textsuperscript{(6, 8, 23, 24)}

Rizk et al. divided 50 patients with frozen shoulder into two groups. Group A (26 patients with 28 involved shoulders) was treated utilizing heat modalities, Codman’s exercises, wall climbing exercises, shoulder wheel-pulley exercises, and gentle, rhythmic stabilization manipulation of the glenohumeral joint. Group B (24 patients with 28 involved shoulders) was treated using prolonged pulley traction and transcutaneous nerve stimulation simultaneously. Although
both groups showed improvement, group B displayed better results at the completion of the treatment period\(^{(16)}\). Our client was initially instructed to do pendular exercises (patient leans on the wall or on a table counter with the good arm and lets the affected arm hang, then moves the affected arm in flexion/extension, abduction adduction and circumduction clock-wise and counter clock-wise as a pendulum) wall walking with hands, utilization of pulleys and broom stick for stretching the tight muscles and structures. Emphasis was placed on the external rotation. Later on, as the pain decreased, strengthening exercises were added. Polkinghorn reported successful treatment of two cases of adhesive capsulitis utilizing a mechanical force, manually assisted short lever adjusting device (activator) to manipulate the affected shoulder, cervical and thoracic spine.\(^{(20)}\) However, in the case presented, the author used large amplitude rhythmic oscillating movement within midrange of movement and up to point of limitation (PL) in range of movement (grade II & III).

Before after each set of mobilization Small amplitude rhythmic oscillating movement at the beginning of range of movement (grade I) were performed to decrease any discomfort. It is the author’s experience and opinion that a trained physical therapist is skilled enough to modulate the force and the speed of the mobilization to achieve the desired outcome. Ferguson reported three cases of frozen shoulder which he successfully treated using trigger point therapy techniques.\(^{(22)}\) Although no trigger point was found in our patient, tender points were treated. Soft tissue release Technique was utilized on the rotator cuff and the scapular stabilizing muscles to release the adhesions in the muscles caused by the restricted ROM and disuse associated with adhesive capsulitis.

**Conclusion:**

Many authors recommend that adhesive capsulitis is a clinical diagnosis of exclusion. However, it can be identified by the restricted capsular pattern and forward flexion, pain, and severely decreased passive ROM with feeling of a mechanical block at the end range. A case report is presented to demonstrate the potentials of physical therapy and Maitland’s manual mobilization techniques of the shoulder in a patient with adhesive capsulitis. However, further research is needed to identify the effectiveness of this treatment.
References