Primary Adhesive Capsulitis Relief in a 47-Year-Old Female with an Associated Vertebral Subluxation Complex

by: Calla Jean Kleene, DC

Abstract

Objective

To provide clinical management and discussion of primary and secondary adhesive capsulitis in patients with associated vertebral subluxation complex (VSC).

Clinical Features

A 47-year-old woman who had been suffering a 12-month history of primary adhesive capsulitis and sought chiropractic care to facilitate pain relief, increase function, and range of motion in her right shoulder. History revealed severe discomfort, pain, and significant loss of range of motion in her right shoulder that progressively got worse over a 12-month period. Initially the patient noticed pain in her right shoulder after an upper body training session. She previously received orthopedic evaluation and management and chiropractic adjustments but after several failed attempts she was referred for Active Release Technique (ART) and Graston Technique (GST) in conjunction with chiropractic manipulative care. The patient is an active female with no other significant health concerns.

Interventions and Outcome

The primary goal was to relieve shoulder pain and/or increase functionality and range of motion in the patient's right shoulder. History revealed severe discomfort, pain, and significant loss of range of motion in the right shoulder that progressively got worse over a 12-month period. Initially the patient noticed pain in her right shoulder after an upper body strength training session. The initial appointment revealed that the patient was to be scheduled for manipulation under anesthesia to address her symptoms but elected to try additional chiropractic care first.

Conclusion

The patient improved with conservative management thus eliminating the need for a more aggressive procedure.

Background

Codman first described the symptoms of adhesive capsulitis (AC), now commonly known as frozen shoulder, as a slow onset with pain near the insertion of the deltoid, inability to sleep on the affected side, painful and restricted elevation and external rotation, and a normal radiological appearance[1] At that time he developed what is known as Codman's Criteria. The criteria for diagnosing AC at that time is listed in Table 1.11.

Table 1.11: Criteria for diagnosing AC

The condition comes on slowly	Restriction of adherent type
Pain is felt near the insertion of deltoid	Atrophy of the spinatii
Inability to sleep on the affected side	Little local tenderness
Painful & incomplete shoulder elevation	X-rays negative except for bony atrophy
Plus external rotation	The pain was very trying to every one of them
Restriction of spasmodic type	Patient is able to continue their daily habits & routines

In 1992 the American Shoulder and Elbow Surgeons Society defined AC as a condition of uncertain etiology that is characterized by clinically significant restriction of active and passive shoulder motion occurring in the absence of a known intrinsic shoulder disorder.[2] AC can be classified into primary and secondary forms. Primary AC is due to idiopathic causes and secondary AC is generally a result of changes in the structures and tissues supporting the shoulder and/or diseases such as in patients with diabetes or autoimmune diseases.[2, 3,4]

Studies have shown that 90% of patients with AC have pain for one to two years before subsiding. Currently there are no studies indicating a decrease in quality of life due to pain and symptoms inhibiting the use of the shoulder in patients that overcome AC without treatment.[2, 5] Shoulder pain is the third most common cause of musculoskeletal disability in the workplace after lower back and neck pain and one of the top ten reasons for disability in the United States.[6] AC is one of the most common causes of shoulder pain seen by family physicians and the prevalence of frozen shoulder is 2-3%, and it usually starts between age 40 and 70.[7] Moreover, after low back pain, shoulder pain is the second most common cause of occupational injury claims.[8] AC has been associated with

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several conditions. A higher incidence of frozen shoulder exists among patients with diabetes (10-20%) compared with the general population (2-5%).[8,9] Incidence among patients with insulin-dependent diabetes is even higher (36%), with an increased frequency of bilateral shoulder involvement.[10]

In order to treat AC, it is essential to understand the functional anatomy of the shoulder. Static stabilizers consist of the articular anatomy, glenoid labrum, joint capsule, and glenohumeral ligaments. The dynamic stabilizers include the rotator cuff muscles, long head of the biceps tendon, scapulothoracic motion, and other shoulder girdle muscles such as the pectoralis major, latissimus dorsi, and serratus anterior.[11,12] The rotator cuff consists of four muscles, which control three basic motions: abduction, internal rotation, and external rotation. The supraspinatus muscle is responsible for initiating abduction, the infraspinatus and teres minor for controlling external rotation, and the subscapularis for controlling internal rotation. The rotator cuff muscles provide dynamic stabilization to the humeral head on the glenoid fossa, forming a force coupled with the deltoid to allow elevation of the arm. It is responsible for almost half of the abduction strength and a majority of external rotation strength.[13,14]

The idiopathic form of frozen shoulder has two principal characteristics; pain and contracture. Pain associated with AC is progressive in nature which begins most commonly upon abduction and external rotation or extension and internal rotation. Over time a patient's range of motion becomes painful and can worsen with overuse. Repetitive movements may aggravate the pain. [3, 15]

Contracture and fibrous adhesions develop as a result of injury causing one to increase effort and lead to compensatory dysfunction. Repetitive effort makes muscles tighten and can cause adjacent soft tissues to be drawn tight, causing them to weaken. As a result, friction, pressure, and/or tension can build up. Consequently acute injury and inflammation can occur even without external forces being applied, causing decreased circulation or edema or a cycle between the two. Cellular hypoxia from restricted circulation cases fibrosis and adhesions may also occur in and between muscle bodies.[16]

Introduction

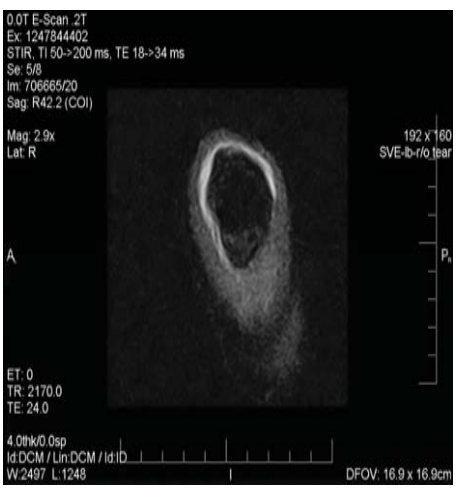
A 47-year-old female was seen for care of AC because the referring chiropractic physician felt after several chiropractic adjustments alone did not alleviate the shoulder pain or increase the range of motion or function. The patient's health history presented no other significant findings that would be related to the AC. At the initial consult, symptoms had been present for 12-months and history revealed the pain started within 24 hours after an upper body specific workout focusing on deltoids, biceps, triceps, latissumus, and teres major and minor. Following the workout, she felt dull shoulder aches in her right shoulder for several days with the pain never subsiding. Up to that point the patient stated she was active and worked out for a minimum of 30 minutes per day, 5-7 days a week. She stated her workout plan consisted of high repetition, low weight, tone specific area workouts that varied daily.

Over the course of two weeks the patient said the pain worsened. She sought care from her general practitioner who prescribed nonsteroidal anti-inflammatory drugs (NSAIDs). She stated NSAIDs provided little relief from pain and did not provide an increase in function and range of motion (ROM). Ten months later she was referred to an orthopedic specialist who ordered X-rays of her right shoulder. The X-rays revealed no radiographic evidence of abnormality. An MRI was ordered and revealed a combination of supraspinatus tendinosis with articular surface fraying without muscular atrophy and mild subacromail-subdeltoid bursitis. At that time the patient was given the option of steroid injections or manipulation under anesthesia. The patient was made aware of the risks associated with the injections and surgery and chose to wait.

Upon initial exam, the patient was able to perform limited active ROM during Apley's scratch test. The test was positive for severe loss of motion in essentially all directions: internal, external, abduction, and test elicited pain upon movement. The Apprehension test was positive although no history of dislocation was present. The Codman's Drop, Dawbarn's Sign, Impingement Sign, Mazion's shoulder maneuver, and Supraspinatus press were not performed due to pain and restriction. The Speed's test was performed; however, she could only perform forward flexion of the humerus to 50 degrees. Resistance caused moderate to severe pain; this can be indicative of bicepital tendinitis (BT).[13] Subacromial push-button sign was performed and caused severe pain over the anterior deltoid. Global shoulder pain and limited range of motion associated with AC resulted in some orthopedic tests to lose sensitivity and specificity. [10]

Examination revealed active and passive ROM significantly diminished in all directions. Passive forward flexion was measured at 50 degrees, abduction at 30 degrees: internal rotation and external rotation could not be measured with the arm abducted to 90 degrees, the elbow flexed to 90 degrees, and the forearm reflecting the midpoint between internal and external and internal rotation due

Image 1: MRI of the suprapinatus tendinosis
Image 2: MRI of the subacromail-subdeltoid bursitis



to the inability of the patient to abduct to 90 degrees. Instead, internal ROM was visualized with the arm at the patient's side and attempted to place on the low back. Internal ROM was approximately 45 degrees. External rotation could not be measured due to pain.

The patient completed the Quick Dash outcome measure and scored a 63.9.17. The visual assessment showed high right shoulder, decreased thoracic extension evident, and anterior head carriage with head sway to the left. Taut and tender fibers bilateral along the cervical paraspinals were also present. Serratus, biceps, triceps, and pectoralis musculature was graded 4/5. Compensatory and overactive and hypertonic trapezius, scalenes, subscapularis, supraspinatus, and levators were noted bilaterally with moderate to severe spasms on the right scapulo-thoracic junction and shoulder girdle. The deltoid showed signs of edema, increase in temperature and was painful to the touch. Considering the case presentation, infection was ruled out since it was not revealed on the MRI or X-ray and nothing in the history indicated otherwise. With the apparent lack of motion at the glenohumeral joint, it was assumed that the subacromial bursa, and possibly the subcoracoid bursa had become a reservoir of stagnant synovial fluid.[14] When synovial fluid does not circulate, it becomes viscous and the walls of the bursa can begin to adhere to one another, thereby decreasing the capacity of the joint capsule with resulting restricted movement of the humeral head as a result of the so-called "adhesions".[18,19,20]

The upper extremity deep tendon reflex performed on biceps, brachialradialis, and finger flexion and was graded 2+ bilaterally. Palpation revealed moderate hypertonicity of the cervical and thoracic paraspinal musculature C2-C6 and decreased left lateral bend noted in the cervical spine. Thoracic extension was decreased T2-T12 with taut and tender fibers bilaterally. Left PSIS revealed edematous changes and increase in temperature.

Treatment Methods

ART is a hands on treatment and case-management system that allows a practitioner to diagnose and treat soft-tissue injuries. Soft tissue refers primarily to muscle, tendon, fascia, and nerves. Specific injuries that apply are repetitive strains, adhesions, tissue hypoxia, and joint dysfunction.[16]

> *"ART is a hands on treatment and case-management system that allows a practitioner to diagnose and treat soft-tissue injuries."*

With this particular case the shoulder was fibrotic and full of adhesions. Cellular hypoxia from restricted circulation at the gleno-humeral causes fibrosis and adhesions occurred in and between tissues. At the same time the patient was experiencing decreased circulation and edematous changes at the joint due to weak and tight muscles. When the patient was recovering from the overuse injury, compensation and repetitive effort made her muscles tighten and over time, led to AC. When a muscle is tight it tends to weaken and when a muscle is weak it tends to be tight, causing the adjacent soft tissues to be drawn tight.[16] The goal in using ART for AC is to restore proper function and reduce pain. ART "shortens" or contracts each individual muscle (of the area of complaint) and applies a specific tissue tension based on the individual tissue function. When using ART, the best method of isolating the structure that causes the symptom is to sequentially palpate and put pressure on each of the structures one at a time.[16]

ART was performed on the teres major, subscapularis, infraspinatus, teres minor, supraspinatus, trapezius, rhomboids, scalenes with leavator scapulae, triceps, biceps, deltoid, pectoralis major (on the posterior surface - variation) and latissimus dorsi.[16]

GST is a technique that uses patented stainless steel tools that address soft tissue changes and abnormalities. The GST instruments consists of six individual tools with unique edges designed to treat the various contours of the patient's body. Tools #2, #3 and #4 when used over the deltoid and supraspinatus. When focusing on the deltoid the #2 and #4 where used with treatment was applied medially while the patient abducted and adducted her right arm and foreman continuously for 5-8 minutes. Tool #3 was used to work on the supraspinatus while the patient actively placed her arm in abduction and external rotation and moved towards adduction and internal rotation while treatment was applied medially over the muscle belly. Both active ROMs for the deltoid and supraspinatus required the patient to hold a 5 lb weight.

Based on patient presentation, motion palpation, tissue changes, and joint dysfuntion adjustments were administered at C1, C2, C5, T2, T6, T9, and left illium using diversifed short lever adjustments delivered while the patient was seated in a chair for the cervical region, prone for the thoracic region, and side posture for the illium. C1 and C2 were counter-rotated.

Contact was made on the transverse process of C1 on the right and line of drive was posterior to anterior, right to left. C2 contact was made on the left lamina-pedicle junction and line of correction was left to right, posterior to anterior. C5 contact was made on the left lamina-pedicle junction with line of correction being posterior to anterior, left to right. T2 and T9 subluxation was corrected posterior to anterior and counter-clockwise torque while T6 was corrected posterior to anterior, clockwise torque. Left illium was corrected side posture lateral to medial.

During the second visit (three days later) motion and static palpation of the right shoulder demonstrated evidence of glenohumeral misalignment. Traction was performed while the patient was seated using the humerus as a lever while pressure was applied lateral to medial at the distal end. Ultrasound was used during the second visit using continuous setting of 1.5w/cm2 at 1 MHz for ten minutes. Palpation and decreased motion revealed a slight humeral subluxation inferior. The patient's humerus was crossed midline and bent at the elbow joint and a slight impulse was applied medial to lateral, inferior to superior, and anterior to posterior to reduce subluxation.

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Results

The patient had improved range of motion after a combination treatment of chiropractic adjustments and myofascial release. She was seen three days later and was administered an ultrasound over the deltoid muscle body to reduce pain. Approximately ten degrees of forward flexion and fifteen degrees of external rotation was lost between the first visit and before treatment was performed on the second visit. ROM was regained and increased after the second treatment was administered. The patient was seen again four days later, and she retained improved ROM from the previous visit. After treatment on visit three, patient has full ROM restored. See Table 2.

Table 2: Passage Range of Motion

	ROM Abduction	Forward Flexion	Internal Rotation	External Rotation
Initial treatment	30º	50º	45º	NA
After 1 treatment	90º	80º	50º	90º
After 2 treatments	120º	160º	90º	90º
After 3 treatments	180º	170º	90º	90º

The patient reported pain during the myofascial release but stated positive outcomes following the treatment. During the correction of the inferior humerus, patient reported pain upon correction but the examination showed improved ROM and functionality. Once mobility was restored, the patient was scheduled for subluxations and myofascial restrictions every 5-14 days. Active rehab consisted of lifting free weights (2-10lbs) focusing on biceps, triceps, deltoid, and rotator musculature bilaterally until full strength was restored. She was monitored for proper lifting patterns prior to working out without assistance. Resistance work was started, focusing on internal and external rotation with elbow bent at 90 degrees and humerus at 0 degrees. The patient reported a significant reduction in pain and increase in functionality of her right shoulder and arm over the course of treatment. She also reported improved sleeping patterns, and an increase in energy.

Discussion

There are numerous methods for treating AC with the overall goal of restoring function and decreasing or eliminating pain.[21] For this particular case, myofascial release techniques along with thoracic and cervical adjustments showed remarkable results with three office visits within a seven day period. When chiropractic manipulative therapy (CMT) alone is not alleviating the condition it is necessary to look to the connecting structures. Joints and soft tissues move together, thus making it acceptable to use both CMT and myofascial release in treatment of AC.

In considering other treatments, corticosteroid injections have shown to help patients with severe and prolonged pain; however, there is no evidence whether injections actually shorten the ultimate duration of disability.[22,23] Manipulation under anesthesia has proved some success but significant risks including fracture of humerus, radius, or ulna can occur, as well as dislocation, increased pain, tearing of the rotator cuff, and peripheral nerve damage. Manipulation under anesthesia should be a last option.

Conclusion

This patient sought chiropractic treatment after the AC had been diagnosed. Treatment consisted of a combination of chiropractic adjustments at C1, C2, C5, T2, T6, T9 and Left illium, myofascial release and ultrasound over a 14-day period. This treatment protocol resulted in a complete return of full range of motion at the glenohumeral joint in both active and passive motions. Decrease in pain, and increase in functionality was reported. The patient improved within three office visits.

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