Frozen Shoulder: A Review

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"Doc, I can't move my shoulder, and it hurts like !@#! when I try."

"Let me check it."

"Ouch!!! "

Hear that frequently? Me, too. Shoulder pain is a common complaint in the chiropractic office. A particularly arduous form is called "frozen shoulder." "Frozen shoulder" covers a variety of shoulder problems whose chief features is a painfully immobile shoulder. This is a brief treatise on the topic. References cited at the end of this paper and a search on the N.I.H. Pubweb will help those wishing to further pursuit their understanding of this condition.

What is "frozen shoulder"

The term "frozen shoulder" is difficult to define due to a broad range of conditions than present with painful and restricted shoulder motion. Most define it as an idiopathic condition characterized by marked restriction of both active and passive movement of the shoulder without a known intrinsic disorder of the shoulder. (1,2) Typically, the patient is unable to flex, abduct, and rotate – in particular, external rotation – the affected shoulder. (3)

Common synonyms are *adhesive capsulitis* and *pericapsulitis*, among several other names, (4,5) although the use of the term "capsulitis" is controversial. Naviaser found, on arthroscopic examination, adhesions of the axillary fold and the capsule attached to the anatomical neck of the humerus that was initiated by inflammation of the fibrous synovium that becomes fibrotic with perivascular infiltration. (6,7) Others have not found evidence of an inflammatory process or adhesions. (5,8,9) Naviaser states that the differentiation between "stiff and painful shoulder" and "frozen shoulder" is capsular adhesions in the later. (6,7) Bunker and Anthony have found absence of significant inflammation and no involvement of the synovium but found muscle contracture that check-reins motion. Surgical assessment of excised tissues showed fibrosus rather than inflammation with histological tissues and immunocytochemistry identical to Dupuytren's contracture of the hand. They consider it to be a Dupuytrens-like condition. (8,10) Some of the differing observations may be due to the stage of progression of the condition. Take your choice.

The cause is unknown outside of trauma or secondary to organic or iatrogenic problems. (1,9) Immobilization may be a factor as it is uncommon in those who actively use their upper extremities. (6,7,11) Gerow claims a possible link with auto-immune disorders, (12), but others have found neither a link with specific auto-immune nor with arthritic processes. (1,9). The cause may be neurological, (5,13) and of course, we feel that the cause is from altered nerve supply as a result of vertebral subluxations.

In the natural history of this condition, there are three characteristic phases. (1,2,9,10,12) The first is the "freezing" phase where there is an insidious onset of pain of increasing severity and progressive loss of both active and passive motion. This occurs over a several months period. The second stage is the "frozen" phase which also takes place over several months. There is reduction in pain, but the global joint stiffness remains. The third stage is the "thawing" phase. There is return of motion over several months or up to two or more years. Residual limitation to the range of motion is common, although functional impairment is usually not significant. (1) Arthroscopically,

four stages are described. (10) It is said to be self-limiting, but residuals are common, and the time for any recovery is long . (5,14)

Travell and Simone state that the subscapularis muscle is typically involved. (15) The subscapularis muscle is innervated by the upper and lower subscapularis nerves from C5/C6. (15,16) Calliet states that it is due to tendinitis of the supraspinatus tendon. (Calliet) Others have suggested that the coracohumeral ligament may be contracted (8.17) and have found improvement after release of this ligament. (8)

Calliet discusses the "periarthritic personality." This is someone who suffers from "deep-seated tension, anxiety, and passive apathy" and has a low pain threshold. These patients will immobilize painful joints which leads to the effects of disuse. (4 This idea has been challenged by Naviaser. (6)

A patient of Dr. Peter Thibodeau states on his web site that he found, through informal polling, that around 20% of those with diabetes mellitus had at least one episode of "frozen shoulder."(18,19) Published incidence is 10% to 20% and, in insulin-dependent diabetics, 36%. (8,20) The incidence among diabetics is 2 to 4 times higher than in the general population. (1) Diabetics have a poorer prognosis. (11) Forty-two percent of those with bilateral involvement are diabetics. (8) Why this occurs is unknown. Some opine that tissues obtained suggest diabetic cheirarthropathy. This condition is characterized by contracture of flexion muscles, but Bunker and Anthony dispute this and had found the affected tissues to be similar in both diabetics and non-diabetics. (8).

"Frozen shoulder" has also been associated with other conditions, some medications, and surgery. (1,9,10,12) It has been associated with Parkinson's disease, hyper- and hyperthyroidism, heart disease, among others. A few have found an association between cardiac and upper extremity surgery. (10,12)

Presentation

It appears to be slightly more prevalent in women (1,5,6,10,12) and usually occurs between 40 and 60 - 70 years of age. (1.6,9,10-12) It tends to occur in sedentary people rather than those who actively use their upper extremities. (6,11) It typically affects only one shoulder, usually on the nondominate side. (5) Fortunately, reoccurrence is not common (1,10,12), although, the opposite shoulder may be affected later. (9,1)

Common complaints include difficulty when reaching to the back pocket for a wallet, pulling down the back of a collar, inability to clasp a bra, or difficulty brushing one's hair. (5,) Most can reach directly forwards or backwards, but internal or external rotation is usually painful. (6) Initially, "frozen shoulder" features slow onset, pain near the insertion of the deltoid muscle, inability to lie on the affected side, normal radiographs of the shoulder, and pain and restriction upon elevation and external rotation of the shoulder. (4,8,11 Pain tends to occur at night. (10) The patient usually guards the shoulder and may maintain it elevated in adduction and internal rotation at rest and have limited swing during gait. (10) The posture often is stooped with shoulder rounding. (10)

Physical Examination

In the evaluation, one differentiates it from severe arthritis, C6 radiculitis, and rotator cuff derangement, among other conditions. When the shoulder is moved past the restricted range of motion, Pain may radiate over the C5 (5) or C6 (9) dermatome. In some cases, the biceps deep tendon reflex (C6) may be diminished. (9) Paresthesia in the upper extremity has been described but it seems to be distributed to the dorsum of the hand and the fingers rather than limited to the radial side. (9) If "no other shoe fits," then it might be called "frozen shoulder" syndrome.

Upon abduction of the shoulder, the patient raises or shrugs the shoulder because the scapulo-humeral rhythm is altered and the neck muscles rather than the shoulder muscles are used. (4,14) Both passive and active shoulder motions are painful and limited, and pain is present in both activity and rest. (5)

Radiographs of the shoulder usually are unremarkable (11,20,21), and is more useful for ruling out other conditions. (10) Sometimes, osteoporotic changes are noted in the area of the humeral head. (10) Arthrograms show capsular shrinkage as there is substantially less contrast media uptake compared to the normal shoulder. (9.12) MR imaging has found thickening of the joint capsule and synovium, although in contrast to arthrographic findings, articular fluid volume does not appear significantly altered from normal and no thickening of the coracohumeral ligament was found. (21)

Medical Treatment

The typical medical treatment is injection of steroids or ingestion of NSAIDs. Because inflammation is reported not present to a significant degree, corticosteroid injections are not very effective. (23,24) As is known, NSAIDs do not have a beneficial effect on joint cartilage. Physical therapy is often prescribed if the condition does not resolve. Aggressive PT and an exercise program seem to be the best, (Parker), although some claim aggressive PT may prolong recovery. (9) They do not address the cause of the condition. As chiropractors know, health problems have a cause and do not come out of the ether.

Distention or brisement is sometimes done during arthrography. (3,11) It has been found that the joint of a "frozen shoulder" holds less contrast media than normal joints. (3,6) In this procedure more contrast media or a saline with a steroid is injected into the joint to distend it. (10,14) It seems to have some value to some patients, although the reason why is uncertain. (23)

Manipulation of the shoulder while the patient is under anesthesia is also done, although these cases may be the condition of "stiff and painful shoulders" rather than "frozen shoulder," (6) the former being a less severe problem. The benefits of MUA of the shoulder is controversial. (9,20)The tearing of the capsule and other soft tissues may lead to fibrotic adhesions. Other problems may result from MUA of the shoulder, such as, humeral fracture, dislocation of the shoulder, and brachial plexus injury. (10) Rowe and Leffert found that aggressive manipulation (under anesthesia) may prolong recovery. (9)

Arthroscopic or open operative procedures are sometimes done to release the inferior hanging axillary folds, coracohumeral ligament and/or other ligaments. (1,11) Some claim that adhesions are not found in "frozen shoulders," therefore, its value is questionable. (3)

Chiropractic Care

An association has been found between "frozen shoulder" and cervical spine disorders. Hargreaves et al hypothesize that cervical spine problems may cause chronic irritation of the sympathetic fibers in the ventral root that may alter the vascular supply to the shoulder and lead to perivascular tissue atrophy or nerve root irritation may refer pain to the shoulder. The result is guarding and restricted shoulder motion. (13) Finding the right vertebral subluxation is critical to helping these patients. The subluxation may occur at any level from occiput to the pelvis. A common site is the lower cervical and upper thoracic region, in particular, T3-T4 or mid-thoracic spine. It is very important to monitor the entire spine during the course of care. It is not uncommon to find that after correction of the initial subluxation, later, one may have to correct a lumbar, pelvic, or other seemingly distant subluxation to fully restore function and health.

Why does the upper-mid-thoracic adjustments benefit so many with "frozen" shoulder more than the more logical cervical spine? As noted, Travell and Simone state that the subscapularis muscle is involved, but it's innervation is from the C5/C6 nerve roots. (15) As stated, irritation in the C6 nerve distribution has been found by some authors. One or more of several mechanisms might be involved. The C5/C6 levels might be compensating for a mid-thoracic subluxation and the compensation may be affecting the cervical nerves that innervate the subscapularis muscle; there might be an autonomic component via the cervicothoracic ganglion (although it does not seem to have manifestations of a sympathetic problem *per se*, e.g., T4 syndrome); irritation to the subscapularis muscle may be a secondary manifestation of another problem caused by altered nerve supply or biomechanical alterations from the mid-thoracic region; among other possible scenarios. Another affect of thoracic adjusting may be of a mechanical nature wherein there is improvement to rib motion which may benefit the scapulo-costal junction, muscles that affect the neck and shoulder girdle that attach to the ribs in the area of adjustment, or any number of other factors of biomechanical or musculoskeletal dysfunction that affects the shoulder girdle.

Naturally, one must first reduce the vertebral subluxations, but adjunctive care is often beneficial in accelerating the restoration and maintenance of proper function of the shoulder and spine. If the shoulder joint must be adjusted, it must, obviously, be done carefully and gently due to the degree of pain and restriction, particularly in the initial phase. Stretching of the affected tissues helps to break up adhesions. One method is to carefully abduct the shoulder to 90° — to shoulder level — and externally rotate the shoulder. Obviously, one must not exceed patient tolerance. The doctor gently extends the shoulder back and maintains the position for a few seconds to a minute. The pressure is released slowly. Icing after this procedure is helpful. In this position, one can also use one's thumb and put heavy pressure on the anterior deltoid muscle where it overlies the anterior glenohumeral joint. This is extremely painful and can only be tolerated for a few seconds. (19) It's best to tell the patient what you are going to do due to the intensity of pain prior to doing any of these procedures. Other soft tissue procedures and exercises that improve posture and muscle tone may be beneficial. In some cases, adjustments to the ribs and articulations related to the shoulder girdle might be necessary.

Self-rehab exercises are very beneficial. Stretching the shoulder tissues in external rotation is often beneficial. Hammer describes a procedure wherein the patient warms his shoulder for 10 to 15 minutes with moist heat. The patient then lies supine with the affected shoulder abducted to shoulder level and the arm in external rotation and elbow flexed 90°. A one to two pound weight in

the hand helps to stretch the tissues. Moist heat is continued from several minutes up to 30 minutes. This is followed by ice for 10-15 minutes. (17) An exercise for stiff shoulders formerly taught in the Gonstead Seminars utilized a stick about shoulder width in length. The ends of the stick are set between the two palms. The good side slowly abducts the bad shoulder to tolerance. This is done several times. The shoulder being abducted must be completely passive. A more current technique being taught is to use an overhead pulley system wherein the wrist of the affected shoulder is put in a loop attached to the rope. The affected shoulder is passively abducted to tolerance. (25 Specific muscles may need rehabilitation, such as, subscapularis or deltoid muscles.

A common presentation in chiropractic offices is someone who cannot move their shoulder due to pain. This is an acute onset pain, not always following trauma. The pain tends to occur when reaching to their back to reach wallets or bra snaps. Immediately following an adjustment at the appropriate spinal level, not uncommonly the lower cervical or upper thoracic region, full or near full shoulder motion returns without adjusting the shoulder. The level of pain subsides substantially as well immediately post-adjustment. This presentation is often not typical of the chronological descriptions of "frozen shoulder," and is probably what is known as "stiff and painful shoulder."

The determination to call a shoulder problem "frozen shoulder" is not "black and white." The three phases and imaging studies probably confirm it, but many of these cases will present to our offices in the acute or sub-acute phase. Obviously, whatever you want to call it, we must still look for and correct the vertebral subluxations. The chiropractor has a lot to offer patients with "frozen shoulder" or most stiff and painful shoulder situations and can often speed and improve recovery with the correction of the right subluxation. This, in comparison to the medical route whiich is often invasive with prolonged and often limited recovery.

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