Adhesive Capsulitis - Frozen Shoulder

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Adhesive capsulitis (AC), also known as Frozen Shoulder, by definition is a self-limited inflammatory process of the shoulder capsule, characterized as a “clinical condition of progressive pain and decreased range of motion of the glenohumeral joint” (Neviaser 1996). It is of unknown etiology and causes mainly pain and stiffness in one shoulder, rarely affecting both shoulders at the same time. This paper will outline the etiology, epidemiology, pathophysiology, progression, differential diagnosis, signs and symptoms, clinical findings and treatment considerations for Adhesive Capsulitis.

Unlike other conditions that cause pain and stiffness in a shoulder, Adhesive Capsulitis is unique in that it is one of the few conditions that affect the connective tissue forming the capsule of the glenohumeral joint of the shoulder. The etiology of Adhesive Capsulitis is largely unknown, however there are a number of theories postulated to explain its etiology, none of which have been confirmed and accepted into standard western medicine. Occasionally it develops secondarily to injury of the shoulder or from surgery involving the shoulder, breast or lung. However mostly its cause is idiopathic in nature. Theories of its cause range from possible endocrine disorders such as diabetes and hypothyroidism to an autoimmune process. It has also been associated with heart disease, stroke, Parkinson’s disease, Rheumatic disease and lung disease. Likewise, people suffering with these conditions are at a higher susceptibility to developing Adhesive Capsulitis.

Frozen Shoulder, in its idiopathic form, occurs generally in women between the ages of 40-60, suggesting the possibility of an endocrine correlation due to women entering menopause. According to sources such as Wikipedia, 70% of idiopathic cases of Adhesive Capsulitis are women over the age of 40. Rarely is it seen in its idiopathic form in people younger than 40. It is estimated that 2-3% of the general population with develop Adhesive capsulitis (Gerber & Mengiardi 2004).

When diagnosing Adhesive Capsulitis, it is important to rule out other similar and possibly related conditions. A few conditions to rule out would be Calcific Tendonitis (HADD); Milwaukee Shoulder Syndrome (CPPD); Bicipital Tendonitis; Rotator Cuff Tear; Thoracic Outlet Syndrome; Rotator Cuff Tendonitis; Sub-acromial Impingement Syndrome; Osteoarthritis; Acromioclavicular Joint Pain; Early Glenohumeral Arthrosis, Pancoast tumor of the Lung; and Cervical Spine nerve root irritation. Clinical findings show at least 3 to 4 clinical stages in AC, beginning with pain and inflammation, progressing to increased limited mobility. Although the exact cause of the inflammation is unknown, the “disease is thought to be a cytokine-mediated synovial inflammation with subsequent capsular fibrosis” (Rodeo & Hannafin 1997). Further, “the initial stages of AC have a predominance of pain, with gradually increasing joint stiffness brought on by ongoing synovial inflammation and capsular fibrosis. In the later stages, as the inflammatory phase subsides, capsular fibrosis is at its peak” (Rodeo & Hannafin 1997; Grey 1978).

Although diagnosis can be based on clinical findings, MRI is the most effective means of diagnosing Frozen Shoulder and ruling out other possible shoulder conditions. Furthermore MRI can accurately stage Adhesive Capsulitis which is important for deciding the course of
treatment for the patient. As stated in the HHS Journal, “Specific MRI criteria correlated with
the clinical stage of adhesive capsulitis, including the thickness and signal intensity of the
joint capsule and synovium as well as the presence and severity of scarring in the rotator
interval. Routine MRI of the shoulder without intraarticular administration of gadolinium can
be used to diagnose all stages of adhesive capsulitis, including stage 1, where findings may be
subtle on clinical examination. We believe that future studies assessing the role of MRI in
guiding the initiation of appropriate treatment should be undertaken” (Sofka & Ciavarra

Neviaser (Neviaser 1996) clinically categorized four stages of AC, outlining symptoms
and clinical findings in the following table. Most medical professionals however have
simplified this to three stages, namely: Freezing, Frozen and Thawing Stages respectively.

**Stages of adhesive capsulitis**

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| **Stage 1** - Duration of symptoms 0–3 months  
Pain with active and passive ROM  
Limitation of forward flexion, abduction, internal rotation, external rotation  
EUA: normal or minimal loss of ROM  
Arthroscopy: diffuse glenohumeral synovitis  
Pathology: hypertrophic, hypervascular synovitis; rare inflammatory cell infiltrates, normal capsule |
| **Stage 2** - Duration of symptoms 3 to 9 months  
Chronic pain with active and passive ROM  
Significant limitation of forward flexion, abduction, internal rotation, external rotation  
EUA: no change in ROM compared with when patient is awake  
Arthroscopy: diffuse, pedunculated synovitis  
Pathology: hypertrophic, hypervascular synovitis with perivascular and subsynovial scar, fibroplasias, and scar formation in the underlying capsule |
| **Stage 3** - Duration of symptoms 9 to 15 months  
Minimal pain except at end ROM  
Significant limitation of ROM with rigid “end feel”  
EUA: no change in ROM compared with when patient is awake  
Arthroscopy: no hypervascularity seen; remnants of fibrotic synovium. Diminished capsular volume |
Description

Pathology: “burned out” synovitis without significant hypertrophy or hypervasclularity. Dense scar formation of the capsule

**Stage 4** - Duration of symptoms: 15 to 24 months

- Minimal pain
- Progressive improvement in ROM

**ROM** Range of motion, **EUA** examination under anesthesia

Treatment of Adhesive Capsulitis can include a wide variety of approaches, including: homeopathy, nutritional support, heat compresses, cold packs, over the counter anti-inflammatories such as Advil, corticosteroid injection therapy, Osteopathic Manual Manipulation, Therapeutic Exercises, and in some cases surgery.

In one study it was found that intraarticular injection of corticosteroids was helpful when combined with therapeutic exercise: “Intraarticular corticosteroids have the additive effect of providing rapid pain relief, mainly in the first weeks of the exercise treatment period. In patients with adhesive capsulitis who have pain symptom predominantly, intraarticular corticosteroid therapy could be advised concomitantly with exercise” (Bal & Eksioglu 2008).

In another study it was found that joint mobilization was effective in reducing pain and decreased mobility associated with AC. However other techniques such as massage reduced these outcomes: “It was demonstrated significant effectiveness of joint mobilization and exercise for patients with adhesive capsulitis. Ultrasound, massage, iontophoresis, and phonophoresis reduced the likelihood of a favorable outcome, which suggests that use of these modalities should be discouraged” (Jewell & Riddle 2009).

Additionally, in a study published by Physical Therapy Journal it was found that certain physical therapies were more effective than others, namely “in subjects with Frozen Shoulder Syndrome, ERM (End-Range Mobilization) and MWM (Mobilization with Movement) were more effective than MRM (Mid-Range Mobilization) in increasing mobility and functional ability. Movement strategies in terms of scapulohumeral rhythm improved after 3 weeks of MWM” (Wang & Chang 2007). Both Osteopathic Joint Mobilization and Muscle Energy Technique use these mobilizations principles of movement with mobilization and end-range mobilization and so it is postulated that Osteopathic Joint Mobilization, Muscle Energy Techniques, stretching and Therapeutic Exercises could similarly benefit AC in the early stages and perhaps limit the degree of freezing and adhesion development that occurs in all stages of AC.

Unfortunately, other reviews of literature and studies on Adhesive Capsulitis show a limitation in quality clinical studies on effective treatments for the 3-4 stages of AC, suggesting more research is needed for the specific stages themselves and what kinds of treatment are most effective for these various stages. Neviaser and Hannafin state, “Significant deficits in the literature include a paucity of randomized controlled trials, failure to report response to treatment in a stage-based fashion, and an incomplete understanding of the disease’s natural course. Recognition that the clinical stages reflect a progression in the underlying pathological changes should guide future treatments” (Neviaser & Hannafin 2010).

As there are many shoulder conditionals that present with pain and stiffness, it is clear that early diagnosis is important in Adhesive Capsulitis. Receiving an accurate diagnosis in a timely manner can be achieved with MRI as it has been shown to be an effective tool in
diagnosing Adhesive Capsulitis in its early stage. Once diagnosed the next challenge is to provide effective treatment. Although some studies show that certain treatments such as joint mobilization, corticosteroid injection, and therapeutic exercise can be effective in reducing pain and decreased range of motion in Adhesive capsulitis, it is also clear from the review of literature conducted by Neviaser & Hannafin in 2010 that more research is needed to assess which treatments are best at specific stages of Adhesive Capsulitis. This could provide better guidance to effective treatment, thus potentially shortening the duration and degree of impaired range of motion of this painful condition.

References


www.Wikipedia.com