The ISAKOS Upper Extremity Committee Consensus on Shoulder Stiffness

- Definitions

One of the main discussions throughout the last century is that there is no consensus about the definition and classification of frozen shoulder. This influences the numbers concerning incidence. What has been done about definitions and clinical symptoms?

Definitions as have been used in the past:
“Frozen shoulder is a condition characterized by current or past pain in the upper arm, with global restriction of glenohumeral movement in a capsular pattern. Specific criteria are: A history of unilateral pain in the deltoid area, and equal restriction of active and passive glenohumeral movement in a capsular pattern (external rotation > abduction > internal rotation).”

“Frozen shoulder is a condition characterized by functional restriction of both active and passive shoulder motion for which radiographs of the glenohumeral joint are essentially unremarkable except for the possible presence of osteopenia or calcific tendonitis.”

Stiffness of the shoulder can be divided in primary (“Idiopathic”) and a secondary form.

The term “Frozen Shoulder” is to be used exclusively to describe the primary idiopathic stiff shoulder.

The term “(secondary) Stiff Shoulder” should be used to describe the patient who presents with a restricted range of motion.

The UEW does not recommend that the term “Adhesive capsulitis” should be used as it does not reflect the pathological processes present.

- Epidemiology

Frozen shoulder is first described in the 19th century, by Duplay. (Duplay, 1872). Since then more descriptions and anecdotal notes have been written about this entity. It is not a rare condition, as the prevalence of frozen shoulder is 2-5% in the population. (Tighe, 2008). There is a slightly greater prevalence in women (59-70%), with a mean age of onset of 50.5 ± 8.4. It does not seem to affect the same shoulder twice but sequential bilateral occurrence is found in about 20%.

Co-existent diseases with a greater chance on development of frozen shoulder

Thyroid disease, diabetes, nephrolithiasis and cancer patients have an increased risk on developing frozen shoulder, while curiously, hypertension showed as a protective factor from frozen shoulder.

- History and clinical examination

The diagnosis of “frozen shoulder” is based upon the history of an insidious onset. Pain starts often in the night, and is sometimes so severe, that it prevents the patient from sleeping on the affected side. Gradually pain increases and is present all the time. Pain is often so severe that patients are unable to sleep. At clinical examination the typical finding is a global reduction of range of motion, by definition in two or more planes, and equal in passive and active examination. Three phases of have been described. The first is distinguished mainly by pain and gradually increasing stiffness, and lasts 2 to 9 months. In the second phase, lasting from 4 to 12 months, pain is less severe and there is minor discomfort in the shoulder, but stiffness is substantial. In the third phase, function is gradually restored and pain is resolved. This can take a further 5 to 26 months. Some patients may regain full use of their shoulder within 12 to 18 months, whereas others may have persistent symptoms for several more months. An important differential aspect is that in “frozen shoulder” there is no anatomical abnormality, no imaging abnormality, and no systemic abnormality or disease that can directly explain these typical signs and symptoms. Opposed to that, the diagnosis of “Stiff shoulder” is based on a history of joint related disease or trauma.

- Physical examination:

In patients with stiff shoulders, essential measurements of ROM are forward flexion, external rotation with the arm at the side, and internal rotation in the standing position. In addition, in order to eliminate
the effect of pain during the measurement, measuring the external rotation with the patient in the supine position can be helpful through stabilization of the scapula. In “Frozen shoulder” in the early phase loss of external rotation with the arm along the side is typical, the pain is located at the insertional area of the Deltoid on the proximal part of the humerus, and there is often some tenderness at palpation of the coracohumeral ligament. Important feature is that the reduction in range of motion is fixed, and not influenced by pain. This means that even in a fully anaesthesized patient the range of motion will be similarly reduced. Strength is unaffected when tested within the pain free range. During the evolution from phase I to phase II pain diminishes, but stiffness persists.

As a guideline, if the range of motion measured is less than 100 degrees in forward flexion, less than 10 degrees in external rotation, and less than L5 level in internal rotation, we can define this as “frozen shoulder”.

In patients with “stiff shoulders” the range of motion is typically reduced in the directions affected by the underlying abnormalities. Often there is a difference in ROM between active and passive examination. A prerequisite is that there are imaging abnormalities coinciding with the decreased range of motion.

During the first period differentiation between other causes of shoulder pain is difficult, as pain is the principal problem, and stiffness is not yet evident. Differentiation can be difficult. In the early presentation of degenerative disease of the joint or the rotator cuff, the same primary symptoms may be prominent.

- Imaging
  In idiopathic frozen shoulder, the only pathology seen on imaging is a smaller axillary puuch on arthrography, on MRI a synovitis-like change around the rotator interval, and, on X-rays, secondary osteopenia. In a large group of patients with idiopathic frozen shoulder, no rotator cuff tears were demonstrated. Rotator cuff tears or other intra-articular pathology points at another reason for diminished ROM, so classifying it as a secondary stiff shoulder.

- Medical therapy
  There is evidence that treatment of frozen shoulder with only NSAID’s has no effect on the natural course of frozen shoulder
  There is evidence that oral corticosteroid use decreases pain and has a positive effect on ROM in frozen shoulder at the short term (6 weeks)
  A longer course of oral corticosteroids could have a longer lasting effect on pain and ROM in frozen shoulder
  There is evidence that intra-articular steroids have a short time effect on pain. Repeated injections can be beneficial, with a maximum of three.
  The effectiveness of an image-guided intra-articular injection is more predictable than of a “blind” injection

- Physical therapy
  There is no evidence that physical therapy by itself could have a significant effect on the end result of frozen shoulder. A large number of studies has been performed on the different techniques or physical therapy, manual therapy, mobilisation techniques and stretching techniques. Small differences in outcomes are reported, but in most cases either the inclusion criteria are not stringently defined, or the results are operator dependent. Although different physical therapy programs are studied, there is no consensus with respect to the frequency, intensity and duration of physical therapy in frozen shoulder. One study observed significantly earlier recovery of function and diminishing of pain in patients treated supportively, compared to the group that was treated with
passive manipulation. There is no further evidence supporting passive capsular and muscle stretching, soft tissue manipulation, joint mobilization techniques. Patient education about the disease and a program for home exercises, where the patient is able to maintain the painless range of motion are important. Scapulothoracic exercises which include scapular stabilization should be added to achieve the goals of pain decrease and range of movement increase, thus recovering scapulohumeral rhythm.

**Take home messages:**

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