

New Understanding of the Frozen Shoulder

There are some new studies on the condition commonly known as *frozen shoulder*. They have added information to what we know about how this condition develops and how to treat it. In this report, surgeons from the Hand and Upper Limb Centre in Ontario, Canada bring us up-to-date on this topic.

Frozen shoulder (also known as *adhesive capsulitis*) doesn't show up on X-rays or ultrasound. But it causes enough pain, stiffness, and loss of shoulder motion that anyone who has had it knows it's real. So, what's causing it, and what can be done about it?

Changes in the *synovium* (fluid lubricating the joint) have been observed in adhesive capsulitis. This may occur without a known cause. Women between the ages of 40 and 60 are affected most often. Or a *secondary* frozen shoulder can develop after an injury such as a fracture, soft tissue damage, or surgery. Sometimes changes occur in the shoulder joint as a result of osteoarthritis that can also lead to adhesive capsulitis.

Researchers have been studying biopsies of rotator cuff tissue in patients with frozen shoulder who did not get better with conservative (nonoperative) care. They later went on to have surgery to *manipulate* the shoulder joint. In this procedure, the patient is anesthetized (asleep) while the surgeon moves the joint through its full arc of motion. Any adhesions or fibrous scar tissue is torn in the process, thus freeing up the arm.

Taking a microscopic look at the tissue around the shoulder, they found signs of chronic inflammation. Specific inflammatory cells such as mast cells, T cells, B cells, and macrophages were present. Other studies have shown that *vimentin* (a cellular protein) is present whenever the *anterior* shoulder capsule is involved.

Finding specific patterns of pathology at the tissue level may help direct future treatment. Knowing that there are inflammatory cells present may explain why steroid injections seem to have a short-term benefit. Patients get pain relief and improved motion and function. But it's only good for the first six weeks.

The authors summarize the results of studies of shoulder manipulation with the patient under anesthesia. Two groups of patients were observed. All patients received a home program of stretching exercises. One group had manipulation as well. There was no difference in results between the two groups at the end of one-year. The authors point out that these results suggest manipulation is not needed when the patient is actively engaged in an exercise program.

This type of response may be explained by looking at the *natural history* of shoulder adhesive capsulitis. There are three phases of frozen shoulder: *freezing*, *frozen*, and *thawing*. Although it can take months to years, most patients experience full recovery (even without treatment).

But this is not to say that treatment isn't needed. Intervention can shorten the amount of time patients suffer with pain and loss of function. Specific treatment may depend on the stage of the disease (which phase is present) and the patient's symptoms. Most treatments (steroids, Physical Therapy, *arthrolysis*) haven't been studied enough to know which one works best and at what phase.

Arthrolysis refers to the process of injecting air and/or steroids into the joint with enough volume to distend the joint space. The result is a snapping or breaking of the fibrous adhesions holding the joint and keeping it from moving smoothly. Studies using arthrolysis with and without Physical Therapy show a distinct

advantage when using them both together.

Arthroscopic release can be done. But this is an invasive procedure with its own complications and risks. Damage to the axillary nerve can occur. Positioning the arm in *abduction* away from the body and neutral rotation can reduce the risk of nerve injury.

Arthroscopic release of the joint capsule with gentle manipulation has been proven reliable in restoring motion. This procedure works well for patients who have not responded to nonsurgical treatment.

The authors recommend treating all patients with frozen shoulder of unknown cause conservatively at first. Nonsteroidal antiinflammatory drugs (NSAIDs) are prescribed. Steroid injections or oral steroid may be used. Patient education should include giving them a choice of home-based or supervised Physical Therapy. The natural history of frozen shoulder with its three phases is discussed.

Since it is likely to improve on its own, surgery is only offered when patients fail to improve as expected. How much of the joint capsule to release (just the anterior portion, anterior plus posterior capsule release, or global/360-degree release) seems to be based on surgeon preference. More studies are needed to compare these techniques and determine if one has better results (or worse outcomes) than the others.

Many studies fail to study one treatment modality at a time. When two or more are combined, it's more difficult to tell the true treatment effects of each management tool. In time, studies evaluating each modality alone and in various combinations will help guide treatment for this persistently painful condition.

Peter C. Lapner, and George S. Athwal, MD, FRCSC. Shoulder: The Stiff Shoulder: How, Why, and When to Treat. In *Current Orthopaedic Practice*. September/October 2008. Vol. 19. No. 5. Pp. 538-541.