

Frozen Shoulder: What Is It? What Causes It? And What Can Be

Frozen shoulder is the layperson's term for a medical condition called *adhesive capsulitis*. What is it? Well, the answer is not entirely clear. There's inflammation of the tissues in and around the shoulder joint that leads to *fibrosis* (scarring). The shoulder can't move smoothly anymore. Painful and limited shoulder motion are the two main characteristics of this condition.

What causes it? That's not entirely clear either. Sometimes it just seems to come on without any reason. In other cases, it's linked to a stroke, heart attack, or some other systemic illness. In this article, Physical Therapists review the condition and offer up what is currently known about the pathology, diagnosis, treatment, and *natural history*. Natural history refers to what happens over time. For example, in many patients, it seems to clear up on its own over time.

There are different ways to classify or describe adhesive capsulitis. One method divides the condition into two separate types (primary (cause unknown) and *secondary* (linked with trauma or a systemic disorder). Patients with secondary frozen shoulder are further divided into two groups based on which part of the joint is affected (*intrinsic* or inside the joint and *extrinsic*, which is outside the joint).

Physical Therapists may use a different classification scheme altogether. This one is based on the patient's *irritability*. For example, someone with high irritability has pain that limits motion and function. Someone with low irritability may have motion with stiffness, but no pain. For patients with primary adhesive capsulitis, the natural history is one in which the irritability goes down to moderate, and then low.

What's happening inside the joint? In other words, what's the pathologic process causing these symptoms? Here, there are two theories. New techniques of cellular analysis have shown scientists that there is both an active inflammatory process and the formation of fibrosis as an end-product. Yet in some patients, there's no evidence of inflammation, but rather nerve cell damage.

Surgeons can attest to the fact that there's definitely scarring in and around the joint. They see it when they do open joint surgery. Surgically releasing the fibrotic tissue restores motion immediately. Sometimes they see inflammation around the joint. Therapists perform stretching and joint mobilization to help these patients.

What's the natural history of adhesive capsulitis? Experts differ on how they view this. Some say it occurs in three stages, others in two distinct stages. Either way it's described, there's an initial period of pain, then stiffness (the frozen part), then recovery. Sometimes the stiff, frozen stage is divided into the process of *freezing* and then the *frozen* phase.

Because the condition gradually gets better, it is considered *self-limiting*. The whole process takes anywhere from 12 to 18 months in three main stages. But at least half of the patients say they still have stiffness and loss of motion for years. So, what can be done? What works best?

Many studies have been done looking at various types of nonoperative treatments such as acupuncture, nerve blocks, joint mobilization and/or manipulation, exercise, and antiinflammatory drugs. It's difficult to compare and summarize the results done with different tests, measures, and definitions of treatment *success*. Is success measured by the return of full, normal motion? Is it reasonable for this condition? It may be more realistic to see if patients end up with improved, but functional motion.

If patients get better in a year's time, is treatment even needed? If treatment is provided, when's the best time for it? Do antiinflammatories work best (or better than other choices)? If Physical Therapy is the treatment of choice, how often should a patient see a therapist? What treatment techniques should the therapist use? Is it the same for each patient? There are many unanswered questions that need to be studied.

At the very least, it's clear that teaching the patient about the process and what to expect is important. They should be reassured that this is not a quick and easy problem to solve. A couple of Advil and a few exercises aren't the answer. A consistent, daily program of stretching and joint mobilization to reduce symptoms and restore motion is important -- especially during the phase when increased blood supply to the area in response to the condition is occurring.

fibrosis response (scar tissue formation). These fibrovascular inflammatory soft tissue changes are present in all patients linked with adhesive capsulitis.

Muscles stretch easier when they are warmed up. So, before starting a program of flexibility exercises, patients are encouraged to use moist heat before and during stretching. The therapist will help each patient determine how to stretch in a way that does not cause increased irritability. Frequency, intensity, and duration of exercise are calculated based on the patient's irritability level.

Assessment of irritability for classification purposes starts with a sleep history. Can the patient sleep through the night on one side and for how long? Both of these measures are indicators of irritability. A second way to determine level of irritability is pain or stiffness. Stiffness is a sign of fibrosis. Pain is an indication that there is the fibrovascular inflammatory response. Finally, is the patient getting better, staying the same, or getting worse? Knowing how irritated the tissues are helps the therapist determine the appropriate level of exercise.

The authors provide some detailed guidelines for how exercises should be done based on the patient's irritability classification. The goal is to change how the joint perceives input, then low-intensity, short-duration range-of-motion may be best. The result is to reduce pain and muscle guarding with the net effect of increasing shoulder and arm motion. A very helpful table outlining treatment based on irritability is provided.

Since this is an article written by Physical Therapists, the discussion of how to perform exercises for each irritability level and approach may be new to some people who have never heard of it before. What works and doesn't work seems to parallel the cellular level of the connective tissue during each phase from freezing to frozen to thawing. Studies show that too much heat and motion process can result in worse results.

Evidence from research on the role of joint mobilization is also presented. Joint mobilization is a way to move the joint through its range of motion. The technique involves some sliding and gliding of the shoulder joint in a variety of different directions. Which way to move depends on the movement restriction. All joint mobilizations are followed up with an active home program of stretching. Although joint mobilization has positive benefits, it's not clear that this treatment technique is better than some other methods of working with the patient.

If the proposed rehabilitation program using levels of irritability as a guideline fails to improve patient symptoms to the point where surgery may be advised. Under anesthesia, the surgeon may *manipulate* (move) the shoulder. With the muscles around the joint relaxed, the surgeon can put the shoulder through its full range-of-motion, breaking any adhesions present in all directions.

There are some potential problems with manipulation such as fractures or dislocations. It's not a good procedure for a patient who can't perform the necessary follow-up program of exercises. Open incision surgery isn't really done on a frozen shoulder. Arthroscopic surgery of the joint using an arthroscope and release the joint capsule. This isn't always the best option since bleeding into the joint can cause the formation of more scar tissue.

When we step back and look at all the research that's been done with short- to long-term results reported, it's still not clear which approach works best. Most patients get the best results in the first three months no matter what kind of treatment is used. They seem to have a good benefit in the first three weeks. It's likely that pain relief early on allows the patient to move the shoulder through its range of motion and function quickly.

Should everyone have these injections routinely to speed up recovery and reduce overall costs? Probably not. A more conservative approach would be to save steroid injections for patients who don't show improvement (or who continue to get worse) after the Physical Therapy.

The authors conclude that despite the fact that adhesive capsulitis is a fairly common problem, there isn't a clear path to recovery. Using a rehab program based on levels of irritability applies the right amount of stress on the soft tissues of the shoulder and the same tissues. Patients can be taught how to do these exercises at home for the long duration of the problem. The result is improved movement, and return of function. With satisfactory results from this type of program, patients may not have to have surgery.

Martin J. Kelley, PT, DPT, OCS, et al. Frozen Shoulder: Evidence and Proposed Model Guiding Rehabilitation. In *Journal of Physical Therapy*. February 2009. Vol. 39. No. 1. Pp. 135-148.