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Frozen Shoulder

Frozen shoulder is a relatively common condition involving the shoulder joint, which causes pain and loss of motion in that joint, often for a substantial period of time. The shoulder joint, (the joint between the humerus and the glenoid – the socket of the scapula or wing bone) like all joints is surrounded by a capsule which is a thin but relatively strong sack of tissue which holds the normal joint fluid within the joint. In addition to that function however this capsule is responsible for firstly holding the joint together so that it does not dislocate and secondly for restricting the amount of motion in the joint. If this capsule is somewhat lax there is a large range of motion available, but the joint in turn may dislocate. On the other hand if the capsule is tight the range of motion will be restricted, but the joint is very much held together and cannot dislocate.

The exact underlying cause of frozen shoulder is unknown but, suffice to say, what happens is that the capsule of the shoulder joint becomes inflamed. (That is, a true glenoid-humeral capsulitis develops.) Sometimes this is thought to be as a result of trauma but more usually it comes on without injury and is probably caused by a virus (although this has not been proven). There are some factors that may support a viral causation and these include the fact that once a shoulder joint has had this condition it almost never recurs in that same joint suggesting a local immunity. On the other hand however, it can occur in the opposite shoulder joint although the incidence of that is not high.

Another factor that may lead one to believe that this is an infective process is that it is substantially more common in diabetics than in the general population and diabetics certainly are more prone to infection than most members of the general population. Despite this circumstantial evidence and despite extensive research in the area however, the exact aetiology has not been proven.

The Clinical Picture

Initially when the inflammation begins the shoulder becomes sore. This may be noticed as a gradual onset of soreness but often it is noticed as a distinct pain when the shoulder is stretched or pushed, such as during a game of tennis or when reaching out suddenly. After that the pain becomes gradually worse. It is relatively constant in nature, it is always worse at night time and the shoulder is often very difficult to lie on. With time the condition passes through 4 stages.

<u>Stage 1:</u>
Initially there is pain present but the range of motion is relatively normal. This is the stage of early inflammation.

<u>Stage 2:</u>
Following the initial stage, the capsule, which is becoming increasingly inflamed, starts to become swollen and thickened, and as a result it begins to tighten up. As it tightens up, the range of motion in the shoulder becomes gradually restricted and often within 1 – 2 months of the commencement of the disorder this restriction of motion has become apparent. The movement most sensitive to this restriction, and therefore most easily noted, is that of putting the arm behind the back.

Once the condition becomes established the pain can become quite intense and it is always very constant. As the capsule becomes tighter not only is the humeral head jammed into its socket but it is also pushed upwards towards the acromion. Between the top of the humeral head and the acromion lie the rotator cuff trendons and these become increasingly squashed (particularly so when thea arm is taken into an outstretched or elevated position). Pain in the rotator cuff is thus indced and this frequently gives the typical pain down the side of the arm which may well go down the arm even into the hand. It is this pain that frequently leads people to the diagnosis of impingement (of the rotator cuff tendons) as a primary problem. In this case, however, the impingement occurs as a secondary problem, the main problem being within the gleno-humeral joint itself. For this reason a standard injection into the subacromial space and around the rotator cuff tendons, does not fully settle down the problem because it does not deal with the inflammation in the shoulder joint itself.

Stage 3:

If the inflammatory condition within the shoulder joint is left alone it will continue unabated, often for some months, until gradually the inflammatory cycle settles down and the pain starts to go. By that time however, the swelling in the capsule around the joint has turned into scarring, and thus, despite the fact that the pain gradually eases off, the restriction in motion may remain.

Stage 4:

With the subsequent passage of time this scarring gradually stretches up and in better than 90% of cases the ffull range of motion eventually returns. The time course for this condition to go through all four stages is somewhere between six months and two years depending on the severity. Overall however the natural history of this problem is towards resolution and the majority of people do regain full motion of their shoulder or very nearly full motion.

Treatment

There are very few things that can be done for frozen shoulder. It is an inflammatory condition. The joint itself is inflamed and sore and therefore, anything that interferes with that by stretching or pulling on the capsule, will make it sore. As such, during the inflammatory phases, physiotherapy does not help and indeed may make things worse. Exercises and stretching are therefore not recommended and similarly, because of the potential for aggravation, surgery should be avoided.
The one treatment that does seem to offer some help in this condition ins injection of cortico-steroid (cortisone) into the shoulder joint itself. It is thought that the inflammatory cycle within the shoulder joint somehow becomes self perpetuated, probably long after the instigating cause has gone. The aim then is to break this cycle and to try and get the inflammation to resolve. It is uncertain as to why this cycle, once set up, continues along relentlessly but for whatever reason this does seem to explain the long time course of this problem.

At the time when the shoulder joint is injected, the sub-acromial space can also be injected to decrease the element of rotator cuff impingement pain. This often dramatically reduces the inflammation in these tendons and the arm pain that it causes.

Cortico-steroids are very strong anti-inflammatory agents and they attack the inflammatory cycle at several points simultaneously. Because of this they are much more powerful and much more effective

than anti-inflammatory tablets which generally have very little effect in this condition. If the cortico-steroid can be placed into the shoulder joint itself, then in over 80% of cases, the inflammatory cycle can be broken and the inflammatory process will gradually resolve. This happens over a few days following injection and generally, by 1 – 2 weeks, the constant ache of the inflammation is gone and the only remaining ache occurs at the extremes of motion when the capsule is tight. Once the inflammation starts to subside, the swelling in the capsule gradually decreases. As a result of this, the range of motion starts to improve, and in general one would expect a return of around 10-15% of the range within two weeks of injection. To some degree however, this does depend on just how long the problem has gone on, and by how much the range of motion has been restricted.

Once the inflammatory cycle has been broken, the body itself mops up the remaining inflammation. The capsule then starts to gradually stretch up, allowing motion to return again, in exactly the same manner as described above. In this case however, because the inflammation has been treated, the condition passes through the stages towards resolution much more quickly.

Despite the fact that restriction of motion will not have totally resolved within 2 weeks of the injection, the relief obtained by removing the constant ache is often extremely gratifying, particularly if it allows unbroken sleep.

Continuing Management

Once the inflammatory cycle has been broken it still takes a couple of months for everything to settle down, and during that couple of months it is very important not to stretch the shoulder or push it around. This also means that activities such as sport should not be undertaken in that time frame. Subsequent to that however, once the inflammatory cycle has definitely resolved, a gradual stretching programme can be embarked on and at this stage physiotherapy can be very helpful.
If during the recovery phase there is a flare up of the inflammation, then this should be treated immediately by injection to try and stop the inflammatory cycle reforming. It is unusual to have to inject an effected shoulder more than once and extremely unusual to have to inject it more than twice.

Other Treatment

If at the end of this process there is still a restriction of motion, then the remaining capsule has to be either stretched up or released. Sometimes it can be stretched up by distending the capsule with high pressure fluid (hydro-distension), and this is usually done under a general anaesthetic. This tends to work in shoulders with relatively mild restriction of motion but it is not so effective in those with more major degrees of restriction.

Where the capsule is very tight, some form of rupture or release may be required. This can be achieved either by manipulation under anaesthesia or occasionally by surgical release of the capsule (either with the aid of the arthroscope or by open surgery). There are risks and problems with all of these procedures and therefore they are performed only as a last resort. Nevertheless, they can be quite gratifying for a patient who has had a major restriction of motion for a long period of time and is functionally disabled.

In the patient who has protracted impingement (possibly with subacromial spurs) which is made worse by the concomitant onset of frozen shoulder, there may be a case to be made for subacromial

decompression (removal of the spurs to stop impingement). Because of the risk of stirring up the inflammation in the shoulder joint and making the restriction of motion worse however, it is generally recommended that the decompression be delayed as long as possible and preferably until the range of motion has either returned or has been static for a period of longer than three months.

Frozen shoulder as a complication of sub-acromial decompression is now thought to occur in up to 3% of cases. In general this is mild and can be resolved with injections into the shoulder and sub-acromial space as described. The problem however, is that the restriction of motion may take a while to be noticed over and above the post operative restriction, and hence this can easily be mistken for slow but still normal post operative progress. The result may thus be a delay in making the diagnosis which in turn delays appropriate treatment.

Conclusion

Frozen shoulder, or gleno-humeral capsulitis, is an inflammatory condition and the treatment of the condition is directed towards the resolution of that inflammation. This is achieved by rest and local cortico-steroid injection into the shoulder joint itself. The secondary problem of impingement is generally treated by cortico-steroid injection to the sub-acromial space as an immediate reliever of pain. Once the shoulder joint itself has freed up, this secondary problem will usually resolve.

It must be remembered that this is an inflammatory condition and therefore the treatment is not one of stretches and exercises but rather one of rest. It should also be remembered that no matter how long the problem has persisted, the natural history is towards resolution.