

# Shoulder Instability

*Instability is a term describing abnormal looseness of the shoulder joint, such that the ball part of the joint (humeral head) slides out of the socket (glenoid). This differs from laxity which describes a normal looseness of the joint which is not recognised as a problem in itself.*

*Elite swimmer and pitchers all have lax shoulder joints that allow them to have a large range of motion, and when examined, their shoulders can be shown to be loose. These shoulders however are not considered unstable in that they do not come out of joint and stay out, nor do they hurt if they come partly out of joint (sublux).*

*Instability is thus a condition where either; the ball comes out of socket of the shoulder and, for a period of time, stays out; or where the joint comes partly or totally out of joint and this causes pain. It is a pathological condition, rather than a normal physiologic variant such as loose jointedness.*

## *Anterior Dislocation*

This is the commonest of the shoulder instability problems. It is generally an acute injury, in which the shoulder is pushed out of the front of the joint and frequently, it stays out of the joint. It happens when the arm is fully elevated above the head and then pulled back a little further as occurs in going for a mark at football and having an opponent pull the arm back from behind. It can also happen with the arm out to the side such as in a rugby tackle or in a fall. Again, the arm is pulled backwards as the opponent goes past and this induces a dislocation.

Normally a shoulder is held into joint by the capsule, which is a thick glad wrap type of bag surrounding the joint. This contains some thickened areas within it which are the ligaments of the shoulder. As the joint is taken to the end of its range of motion, the capsule (and ligaments within it) become tight, thus stopping the motion from going further and preventing dislocation. The bigger the capsule the more the motion, but as a consequence, the joint is potentially easier to dislocate.

When a shoulder is forced out of joint the capsule becomes torn. Usually this tear occurs at the edge of the socket (glenoid rim). Occasionally however, the tear is more in the central capsule or even at the humeral (ball) end. In the elderly the tear is often of the more central type and this is thought to be one of the reasons why the recurrence rate in this age group is so low.

## *Recurrence Rate*

When the capsule tears off the glenoid (socket), the joint fluid comes to lie in the tear (the gap between the bone and the capsule). This fluid prevents the bleeding that has occurred from clotting and therefore no scar is formed and the tear does not heal. Because of this, the recurrence rate in the under 26 year old group is over 90% and perhaps even over 96%. Certainly if it has happened more than once, it **will** happen again given the right circumstances.

Over the age of 26 years the recurrence rate starts to fall and recurrence becomes very uncommon in the elderly. As stated above, one of the reasons for this is that the pathology in the elderly is different. With tears occurring in the substance of the capsule itself, the healing rate is higher and better. In addition, the elderly play less overhead sports and less contact sports, and hence put their shoulders at risk much less often.

### *Treatment: First Time Dislocation*

This remains controversial. The literature has shown, however, that the recurrence rate is almost independent of the initial management. After the shoulder has been put back into joint, a sling will make it feel better. Continuing to wear a sling for a given period of time however (classically six weeks) makes no difference to the recurrence rate.

Because the arm is most at risk in the overhead position, it is generally recommended that this position be avoided for six to eight weeks. Again, this is a reasonable precaution, but it has not been shown to affect the recurrence rate. Essentially, if the tear does not heal and it is big enough, the dislocation will recur.

Most Orthopaedic Surgeons will advise against surgery until two or more dislocations have occurred. This teaching is based on the fact that some of the older procedures to correct this condition had a number of problems and it was felt that it was important to guarantee that surgery was only offered to those people who genuinely had a recurrent problem. In recent times however the procedures to deal with this problem have improved and the success rate has been high (95%), with only a small percentage of problems. With this in mind, for people in high risk groups (the young, sports people etc.), we are now prepared to offer this form of surgery to first time dislocators.

### *Conservative Care*

After the initial dislocation, it is important to rest the shoulder until the pain has settled. Following this the shoulder can be moved but we would still advise not raising the elbow above the shoulder level until after the six week period as a precaution. A sling is not essential but may help make things more comfortable early on.

Following the initial period, when the shoulder is reasonably well settled, a physiotherapy program to strengthen the internal rotator muscles (the ones that pass in front of the shoulder) helps rehabilitate the shoulder. This has been shown to make the shoulder feel better and it has been shown to decrease the number of re-dislocations that occur. It does not, however, stop a re-dislocation from occurring and therefore does not change the overall re-dislocation rate.

If recurrence occurs, one has to make a decision between surgery to prevent this or a lifestyle change to decrease the risks. The latter option usually means giving up overhead and contact sports and not putting the arm into the fully elevated position where it is most at risk.

## *Precautions*

If your shoulder is liable to dislocate, the most dangerous thing that you can do is swim in the ocean. If your shoulder comes out whilst away from shore and you cannot get it in again, it is hard to both swim and wave for help. There is therefore a serious risk of drowning.

## *Surgery For Dislocation*

Over the years many operations have been described. Most of the older procedures involve tightening of the joint capsule and/or tightening of the muscles across the front of the joint. Whilst the success rate of these procedures is high from a recurrence point of view, these procedures have associated problems including making the shoulder too tight. This tightness restricts motion, and in some cases, leads to early arthritis of the joint.

More modern procedures tend to deal as much as possible with the actual pathology. That is: if there is a tear, it is repaired; if there is no tear but the capsule is too loose to be competent, it is tightened. These two procedures are known respectively as a Bankart repair (after the man who initially described the tear seen in dislocations) and a capsular shift (which can be done in several different ways depending on the nature of the loose capsule and the area of most incompetence). In most shoulders, a combination of the above is required, to both repair a tear and to deal with stretch in the remaining capsule.

To repair the tear requires the capsule to be re-attached to the glenoid (socket). Originally this was done by drilling holes through the edge of the glenoid (socket) and passing sutures through this. This procedure, the original Bankart repair, was technically very difficult and hence was not done very often. Recently however, bone anchors of various sorts have been available. These have made this operation much less demanding to do and thus have allowed this procedure to become popular in most centres doing a lot of shoulder surgery. It is still a moderately difficult procedure to do however, especially if it is done through a split in the muscle rather than by dividing and re-attaching muscle. These anchors however have allowed the latter type of approach to be used routinely and this has helped in making this a procedure that is not particularly painful to carry out.

By not detaching the muscles, the recovery is such that some patients may even manage to get home on the day of surgery. The big advantage of this type of repair however is that it is stronger, allowing earlier rehabilitation and strengthening, and earlier motion.

## *Open Or Arthroscopic Surgery*

With the advent of arthroscopy many techniques have evolved to do this procedure without opening the joint. Unfortunately, the technology is still not quite up to the level where the results are as consistently good as open surgery. The procedure is essentially the same as for the open repair but, because of some difficulties with the fixation of the capsule to the bone, there have been some failures. Ultimately arthroscopic surgery will be the method of choice for everyone, however with the current technology the potential advantages can only be realised in some selected cases.

Technology, like time, is always progressing. As better instruments and techniques become available, arthroscopic surgery will become suitable for an increasing number of patients. As this occurs, more

and more patients will be given the opportunity of having an arthroscopic procedure, rather than an open procedure. As with the arthroscopic repairs of the last decade, one can expect a slightly higher failure rate than with open procedures. One can also expect that there will be less problems with stiffness and loss of motion, and of course less pain and scarring. Ultimately, success rates will match those of open surgery and for some problems they may even be better than open surgery.

### *Post Surgery*

Most patients can leave the hospital within 24 hours of surgery and many can go home the same day. A modified sling type of splint is provided to help protect the arm. This is left on for four to five weeks but even early on the arm can be taken out of the splint to eat, shower or sit around. It is however necessary to wear it at night and when walking around, mainly as a precaution to prevent the arm going out too far from the side.

At four weeks following surgery, motion below the shoulder can be performed and at five weeks, full motion can be attempted. At six weeks, if everything looks good when reviewed, a physiotherapy and strengthening program can be introduced. All going well, sport can be played at three months, or when confident thereafter.

### *Range Of Motion*

Initially the range of motion is slightly restricted. Mostly this range will return with time but sometimes, for certain pathologies, a deliberate restriction of range is necessary. Even with this however, most people get a near full range of motion and can play normal sport.

For those whose sports require an abnormally large range of motion, such as swimming or pitching, the situation is more complicated. It does take longer to get that much range and if the shoulder does stretch up to allow that range then there is a risk of re-dislocation. For this reason therefore, people who play these sports at the elite level need to understand that the price of stability may be a restriction of motion to a more normal level. If this occurs, then of course there is a percentage chance that they will never be able to return to their sport at the same level. On the other hand, with a dislocating shoulder, they may not be able to play their sport in any case. Therefore a choice may not exist.

### *Rotator Cuff Tendon Injury*

Tears of the rotator cuff tendons occur in the young only if the force dislocating the shoulder is high or the shoulder has been taken a long way out of joint. Getting dumped in the surf and water skiing injuries are the commonest cause of this problem. If the tear is bad enough, it may be found that the arm cannot be lifted up under its own power (after the shoulder has been reduced). In this situation early repair of the rotator cuff tendons is advised. Substantial delay in repair may lead to these tendons becoming unrepairable, leaving a permanently weak shoulder.

Tears of these tendons in the elderly are much more common because the tendon structure is substantially weaker than in the younger patient. Again, if, after reduction of the dislocation, the patient cannot raise his or her arm, then this injury should be suspected. Investigation, probably including arthroscopy, should then be carried out. Even though a recurrence of the dislocation may

not happen in this age group, all tendons should be repaired if torn. This will restore power and active motion to the shoulder.

### *Axillary And Other Nerve Injuries*

Axillary nerve injury occurs when the shoulder comes out of joint. It is a stretching injury and fortunately generally recovers completely, though sometimes taking some weeks. This injury causes a small area of numbness on the side of the arm over the deltoid and weakness of the deltoid (the muscle covering the point of the shoulder). Rarely is the nerve damaged to the degree where it doesn't recover.

Other individual nerve injuries are much less common without very severe or open dislocations. Dead arm syndrome is a condition where, after dislocation, the arm feels transiently dead or frail. The arm may immediately go back into joint, but still, the nerves to the arm get an acute stretching injury. This causes a numbness and paralysis of the arm which fortunately passes quickly. With increasing numbers of dislocations however, this problem may worsen and recovery time may increase.

All neurologic injury (injury to nerves) is of concern, and all of the above problems would lead one to consider surgery to prevent dislocation from occurring, thus protecting the nerves from permanent injury.

### *Other Sorts Of Dislocation*

**Posterior dislocation** (coming out of the back of the shoulder) is much less common than anterior (coming out the front). There is usually a significant injury and the shoulder tends to stay out of joint. It is frequently missed, even on x-ray, and generally requires urgent surgery to get the shoulder back into joint. Once reduced, recurrence is fortunately not common.

**Posterior subluxation**, where the shoulder comes partly out of joint particularly when elevating the arm towards the front, is not uncommon. It is due to a large capsule at the back of the joint and generally is not caused by an injury. Mostly it does not cause trouble and although aware of it, most patients do not experience pain or restriction in sporting activity. It is most common in teenage girls, but can be seen in males as well.

Sometimes an injury makes posterior subluxation symptomatic (painful), whereas before the injury it was not. IN this situation the other shoulder may be shown to be just as loose, but not symptomatic. The reason why some of these become symptomatic and do not settle down is not clear, but when this happens, surgery may be required.

It is not often that surgery for posterior instability is required. When symptomatic however, some of these shoulders do go on to cause enough damage to become arthritic. In this situation therefore, surgery may be required to tighten the capsule to try to prevent recurrence. This surgery is similar to anterior surgery, but is technically more difficult and the success rate is probably only about 70%. In addition, it seems to take longer to recover from posterior surgery than anterior, even when no muscles have been divided.

**Multi-directional instability** is truly uncommon. Whilst a number of people are loose in many directions (laxity as against instability), there is usually only one direction that causes problems. For this reason the shoulder can generally be dealt with using a capsular tightening (shift) procedure and this is done on the side of the greatest problem (front or back). When there is a truly multi-direction problem, surgery to both sides of the shoulder may be necessary. If this is the case then it is usually performed in stages; that is, one side is done first and then, when that has stabilised, the other is approached. Because the post operative position of the arm is different for each type of surgery, it is generally recommended that each side be done separately.

Inferior instability (downward dislocation into the armpit) is rare in isolation. Generally it is seen with anterior or posterior problems and, in those instances, a capsular tightening (shift) procedure where the capsule is gathered in to remove the pouch at the bottom of the shoulder, should correct the problem.

### *Complications Of Surgery*

Fortunately, complications with this type of surgery are uncommon. The most likely is bleeding and bruising and this is because the surgery is being performed in an area that is very vascular and bleeds easily. Mostly the problem is minor and self limiting, but very occasionally a bruise is large enough to require exploration and drainage.

**Clots in veins** (deep vein thromboses or D.V.Ts) and the spread of these to the lungs (pulmonary embolism or P.E.) are very uncommon in all upper limb surgery, even when these have occurred with other previous surgery.

**Infection** is very uncommon, with only a small percentage of people even developing a minor superficial wound infection. This rarely requires anything more than a few days of antibiotics to settle, and it does not interfere with the repair. Deep infection occurs in less than 1% of cases, and certainly, this has become very uncommon since all patients undergoing this procedure have prophylactic antibiotics given to them before the commencement of their surgery. If deep infection does occur it may require removal of the bone anchors and other hardware, but generally the repair still succeeds.

Injuries to nerves are the most worrisome of all the complications. Fortunately, these are very uncommon. Nevertheless, there is a potential for nerve injury, because of the close proximity of the major nerves to the area of surgery, and because the surgery can sometimes be difficult. The most common injury is a minor nerve stretch that leads to temporary numbness and weakness in the distribution of the nerve (like having anaesthetic at the dentist). Because the nerve is stretched, recovery can be expected, usually over a few hours to days. Longer recovery times may be seen if the procedure has been very difficult and if the nerve has been stretched over a longer period of time, but again full recovery is expected. Permanent injury to a nerve can occur but fortunately this is very uncommon.

**Failure of the procedure** is the commonest long term problem, occurring in 5% of all anterior instability surgery. This usually occurs 6 – 12 months following surgery but may occur later. After two years however, failure becomes a very unlikely event without further injury. Causes of failure include substantial re-injury, failure to deal with multi-directional problems, poor quality or damaged

tissue which is hard to work with, failure to make the shoulder tight enough and the presence of other abnormal anatomy. In general, most of these shoulders are amenable to further surgery with a reasonable expectation of success.

**Failure of posterior surgery** is thought to occur in about 30% of cases. Often though, this failure is only partial and the shoulder may still be better than its pre-operative state.

Undue tightness and loss of motion after this sort of surgery is uncommon. Some slight loss may be expected as this is, to some extent, the role of the procedure. Marked loss which does not recover with time, however, is uncommon. Fortunately, when it does occur, it is generally treatable.

**Protracted pain** after surgery is uncommon and this generally represents a continuation of pre-operative problems. Most of these represent rotator cuff tendon problems and most are treatable.