Dr Matthew Brick Dr Warren Leigh

Arthroscopic Sub-Acromial Decompression and Open Rotator Cuff Repair

Sub-Acromial Decompression

This operation which was conceived in the early 1970's, is designed to provide more room in the sub-acromial space so that the rotator cuff tendons which pass under the acromion, and therefore through that space, no longer rub on the acromion. In most cases it is thought that this rubbing over a period of time is the cause of tears or holes in the rotator cuff tendons. In many cases these tears give rise to minimal or no symptoms until an injury or period of heavy use is encountered.

Because the prominent bone that causes the tear is still present simple repair of the tendon may not work. As might be expected the underlying cause needs to be removed as well as the tendon being repaired. Hence a sub-acromial decompression is a recommended part of this operation as it removes that prominent bone.

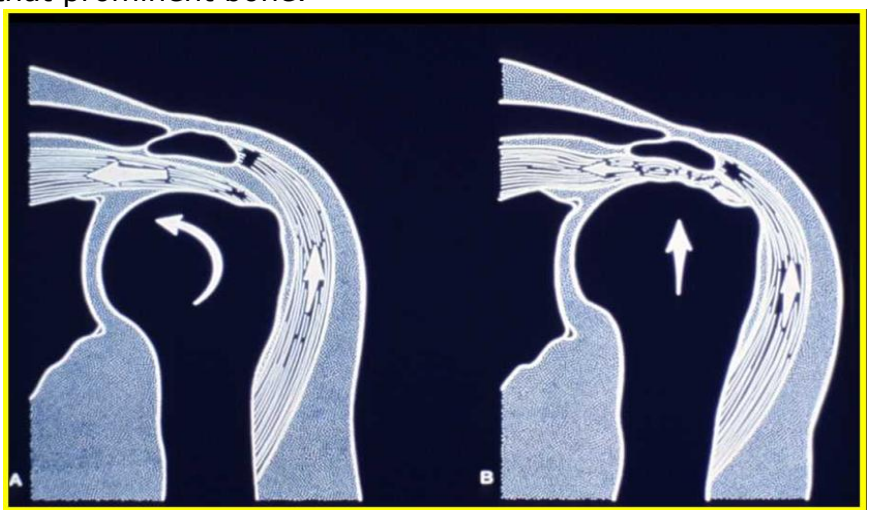

Figure 1: The cuff tendons are compressed between the acromion and the ball of the shoulder joint on the right

Where the tear is acute and due to high force it may be caused in spite of a normal acromion. This is an unusual occurrence but when it happens it could be thought that removing part of the acromion would be unnecessary. As it turns out however, tendon repair always causes some bulking up of the tendon at the repair site and this requires more space than usual if it is not going to rub on the acromion during use. Thus even in this situation sub-acromial decompression is a necessary part of the overall procedure.

Once the decompression has been performed, the tendons need to be repaired if possible. In general these tears have arisen due to an eroding away of the tendon substance rather than a simple pulling off the bone. There is usually therefore a loss of tendon substance and this may make repair difficult or sometimes impossible. When it is possible, however, the aim is to reattach the tendon to the bone and this is done by suturing the tendon ends back to the area where they originally attached by means of suture anchors. (either small plastic pegs or a locking ball of suture similar to a silk knot cuff-link)

Healing of the tendon into the bone is slow and takes about 8 weeks before it is strong enough for the arm to be used under its own power. One reason for this is the tissue has a very poor blood supply. During this period of time it helps to keep the arm moving but obviously this has to be done using the other arm or with the help of a friend or therapist. A single strong pull by the repaired muscle-tendon unit is enough to disrupt the repair during this time.

Following tendon repair the shoulder will always lose motion. The more passive motion that can be maintained during the healing phase therefore, the better. It is however, not always possible to retain a large range of motion and generally this has to be regained over several months. This may take up to 12 months in some cases, particularly if the tear was large and the repair difficult and especially if a sling with a large pillow was needed post-operatively to protect the repair.

We are much less concerned about stiffness than we used to be. Recent studies have shown that stiffness often reflects very strong healing. When we look at cuff repairs five years down the track, the patients who had the stiffest shoulders ended up with the best repairs and the lowest re-tear rates!

In some cases the tear is so large that repair is not possible. In this case the tendon ends are cleaned up and a standard decompression performed. Despite the fact that there is little remaining rotator cuff tendon this still seems to provide some relief of pain in a majority of cases. What it cannot do however is restore power which is lost when the tendon ruptures. This may therefore mean that full motion may not be possible.

Procedure

The first part of the procedure is to perform a sub-acromial decompression. This can be done either open or via the arthroscope. Where possible it is done via the arthroscope to minimize the amount of damage to the deltoid and to make the overall procedure less painful. Despite this, however, the actual tendon repair sometimes needs to be done as an open procedure.

If the preliminary decompression has been done arthroscopically then it is possible to perform the tendon repair through a small split in the muscle rather than having to take that muscle off the bone and replace it at the end of the procedure. This therefore minimizes damage to that muscle and hence decreases pain and promotes earlier recovery. Where possible therefore this method is preferred. (mini-open repair)

The first step in the procedure is to introduce the arthroscope into the shoulder joint itself. This allows the stability of the joint to be assessed and also for the underside of the rotator cuff tendons and the biceps tendon to be evaluated. Any partial tears of the cuff tendons can be cleaned up and full thickness tears can be assessed to see if they require repair (or if the tear is very large, to see whether it is possible to repair it).

Having dealt with the problems within the joint and having assessed the underside of the rotator cuff tendons the arthroscope is then introduced into the sub-acromial space. This space is between the rotator cuff tendons below and the acromion above and is where most of the problems are expected to be.

Most people who go on to get an impingement problem or a rotator cuff tear which does not settle with the usual methods of injection and therapy, have an acromion which is either slightly prominent or more hooked than normal. This means there is less room for the rotator cuff tendons in the space below the acromion, particularly if the tendons have been damaged from an injury and are a little bit thicker than normal from swelling and scarring. The tendons therefore tend to rub on the hooked part of the acromion during movement, (that is, they impinge) and eventually a tear appears.

The aim of decompression is to increase the space below the acromion so that the tendons and the repair zone do not rub. This usually means removing the hook off the acromion and shortening it slightly. This is done with power burrs which are visualized via the arthroscope. Other instruments are used but the burr does most of the important work.

Sometimes after having performed a standard acromioplasty (trimming down the acromion) the outer end of the clavicle (collar bone) is seen to protrude into the space as well. The end of this bone is right next to the acromion and forms part of the roof for the rotator cuff tendons and thus may be responsible for some of the symptoms. In some cases therefore it may be

necessary to either burr off part of the underside of this bone as well, or as is more usually done, to remove the outer end of this bone altogether.

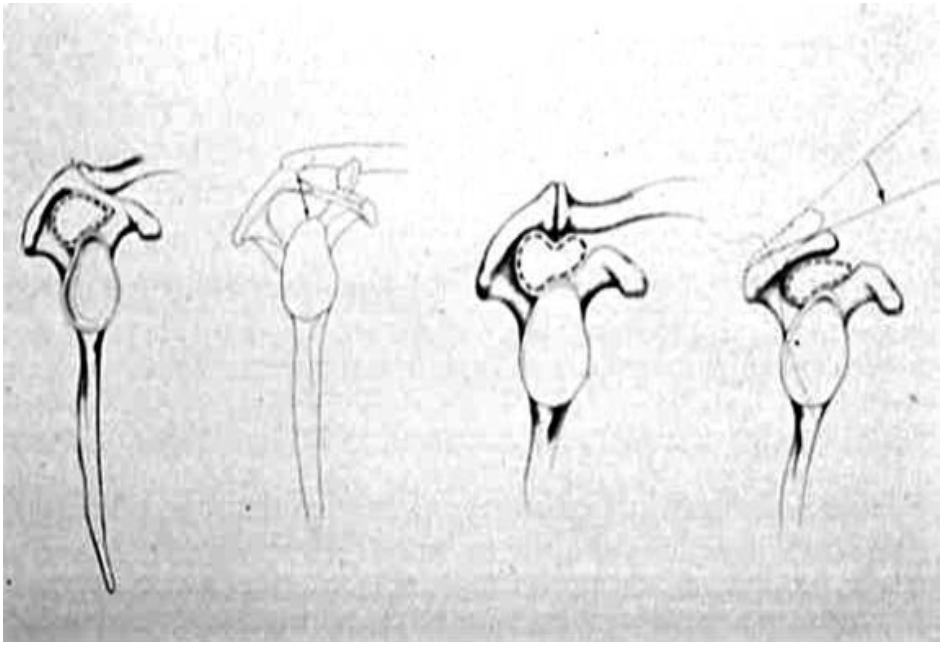

Figure 2.A:The normal space B: Hooked Acromion C: Prominent A-C Joint D: Very flat Acromion

The small joint between the acromion and the clavicle may also give trouble by itself, either because it is loose or because it is damaged and/or arthritic. Again the treatment for this is to excise the outer one centimeter of the clavicle in addition to performing the acromioplasty.

Having the outer end of the clavicle removed does make the procedure bigger and the recovery is somewhat slower than when an acromioplasty is performed alone, but generally progress is still quite quick.

Rotator Cuff Repair

This is performed after the decompression usually through a split in the deltoid muscle between its fibres. Small tears can be treated arthroscopically.

The tendon is sutured back on to the bone using very strong bone anchors. Although the stitches that are used for this do not dissolve they can pull out if the muscle is used before the tendon is healed on to the bone. This is because the tendon tends to soften up during the healing process and it takes several weeks to strengthen up again. Despite this, if care is taken, a good range of passive motion can be obtained and this is very important to speed up recovery and to end up with a large range of motion.

The figure below shows how the tendon can be secured with a bone anchor arthroscopically.

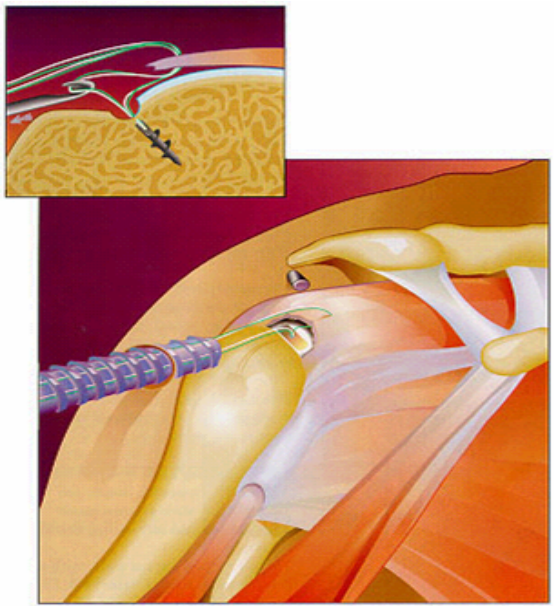

Figure 3: The anchor is placed in bone and is secured to the tendon using very strong suture material.

After Your Operation

1. It is important not to stress the repair by moving the arm under its own power. This does not mean though that the arm should not be moved.

2. Maintaining motion prevents scarring in the sub-acromial space from forming and hence prevents stiffness from setting in. If the shoulder does get stiff in the early weeks post operatively, it generally will recover but may take 6-9 months to do so.

3. It is not important how the shoulder is put through its range of motion as long as it is not under its own power. Usually it is easiest to hold the wrist with the other arm and start with circular motions and then progress to leaning forwards and letting the arm hang down with gravity. This latter can then be extended to having the arm swing or move in circles like a pendulum. Another method is "table-slides". Sit at the kitchen table, take the sling off and gently slide your hand across the table as far as is comfortable. As things settle a pulley can be used with a rope such that the good arm can pull the operated arm up through an increasing range of motion.

4. Despite regaining motion early on, the ache in the shoulder or upper arm may not settle for some weeks. Whilst some of the pre-operative pain may not be evident after surgery, it is common for a

persisting burning pain and often a clicking to be present afterwards and these may only begin to subside when the swelling in the tendons starts to decrease at about the two month period.

5. After the initial period is over and the internal swelling has subsided the shoulder should gradually improve and should continue to improve over a 12 month period. As you have had actual damage to the rotator cuff tendons these need to heal and fully settle down. This may take many months (because tendon is slow to heal) and the overall progress of the shoulder will not be as fast as if the tendons were intact.

6. Generally no therapy is required after you leave hospital and for the first few weeks. Usually however, a rotator cuff rehabilitation programme will be necessary to enhance recovery and this will be organized for you when your shoulder is ready.

7. Until the shoulder really starts to settle it is difficult to lie on that side. It is painful at night time and it is hard to use the arm out from the side of the body. This includes driving in which both steering and gear changing can be difficult. Generally the earliest this sort of activity can take place is at 8 weeks but it is often longer.

8. Initially you will have a bulky dressing on but this may be changed to smaller water resistant dressings before you leave the ward. If so it means that showering is possible but care still needs to be taken early on to make sure that the wound is not getting wet. After four days all dressings can be removed and the wound can usually be wet.

9. The larger wound has dissolving stitches in it which do not require removal. Each of the small wounds has a stitch in it which will need removing at 7-10 days. If you do not have an appointment for review at that time, then please phone the office to obtain one.

10. The office telephone number is (09) 477 2090

Problems

If you are having problems with your shoulder do not hesitate to contact the office or myself. If I am not immediately available I will try to get back to you as soon as possible. If for some reason I am unable to be reached that you may seek advice from the hospital ward or from your general practitioner.