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Shoulder Instability

INSTABILITY means that the shoulder dislocates **completely** (dislocation) or **partially** (subluxation).

Anatomy

The shoulder consists of a **ball** (humeral head) and **socket** (glenoid). The ball is stabilized in the socket by a **cartilage rim** ("labrum", which means "lip") and the ligaments, which attach to the labrum. In other words these ligaments attach to the socket on the one side and to the ball on the other side



Arrow shows a normal labrum (left) and a torn labrum (right)

Dislocation

Usually the ball dislocates to the front (anterior). For this to happen the arm is forced **upwards, backwards and outwards** (abduction and external rotation).



Arm forced upwards and backwards.

There are mainly two types of dislocations:

1. Dislocations due to **trauma (injury)**: During the first dislocation the labrum and ligaments are pulled off the edge of the socket (this is called a "**Bankart**" lesion). As the head slips over the edge of the socket, the latter knocks a hole into the head ("**Hill-Sachs**" lesion).

In a number of cases, especially in contact sports like rugby, a piece of bone is also pulled off the glenoid (socket) as well.



2. Dislocations due to **lax ligaments**: These dislocations may first appear at a relatively young age (16-18) and is a bit more common in girls. They may also have other problems due to the loose ligaments e.g. unstable knee caps, etc. The first dislocation may occur due to minimal trauma in contrast to the traumatic type.



Voluntary dislocater: Laxity of ligaments.

With dislocations the patient may be able to reduce the shoulder himself or in many instances may require a doctor or other trained person to reduce it. At times the patient may need an anaesthetic to reduce the shoulder as the muscle spasm may prevent reduction.

Subluxation

This term is used for “partial dislocation” where the shoulder slips out of the joint partially and slips back into position again.

Diagnosis of instability

1. Clinical: Symptoms of instability

A dislocation is usually extremely painful and disabling. There is total inability to move the shoulder at this stage.

After reducing the dislocation, pain is significantly reduced and the shoulder is mobile again.

Minor or “subtle” instability of the shoulder is experienced as a *feeling of slipping* or only *pain with certain movements*

The deformity of the shoulder is apparent by looking at it from the outside: the upper corner of the shoulder appears “squared off”, a bulge may be felt in front and a hollow at the back.

2. Radiological:

X-Ray:

The dislocation may usually be seen very well on an X-ray. These are also relevant to verify that the shoulder is reduced after reduction maneuver.

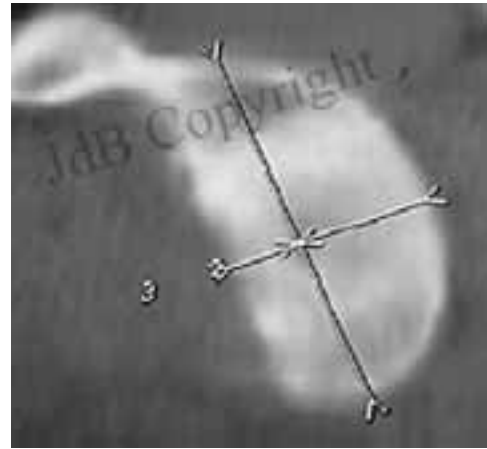
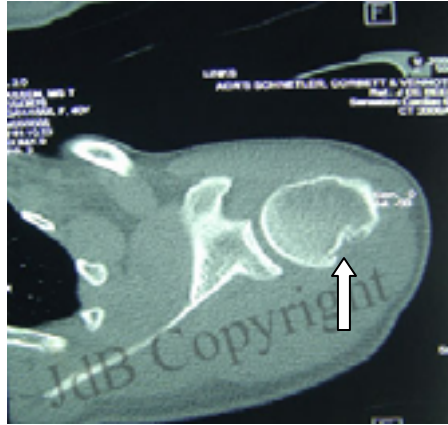


Xrays show a dislocated shoulder (right) and a damaged socket (left)

Computer Tomography (CT) scan

These are done to judge the degree of bone loss on the glenoid edge and also the size of the defect on the humeral head (Hill-Sachs lesion). The size of bone loss of the socket (glenoid) is best seen on a “sagittal reconstruction” view and the Hill-Sachs on the “axillary” view

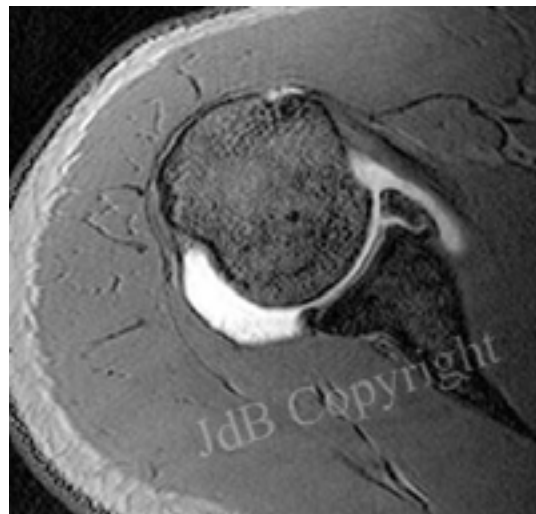
If significant bone loss is seen on these views a ligament or soft tissue procedure is less likely to be successful and the patient may require a bony procedure, e.g. Latarjet operation to deal with the bone loss.



Bone loss due to dislocation of the shoulder on the ball (Hill Sachs lesion) (left) and on the socket (right) is well seen on a ct scan.

Magnetic Resonance Imaging (MRI)

MRI is not needed in every case. These scans may demonstrate the presence of a Bankart lesion as well as the rare HAGL lesion (Humeral Avulsion of the Gleno-humeral Ligaments) which is also referred to as a “reverse Bankart” lesion due to the fact that the ligaments tear off the humeral head and not off the edge of the glenoid as is usually the case.



Arrow shows a separated torn labrum: the BANKART lesion.



Arrow shows torn ligaments from the ball: the HAGL lesion.

Outcome

A Bankart lesion (ligament and labrum tear) **seldom heals** and the shoulder dislocates repeatedly whenever the arm is forced upwards and outwards after the first dislocation.

*The **younger** the patient is at the time of the first dislocation, the more likely will he suffer recurrent dislocations (repeated episodes of the shoulder dislocation).*

The reason is that in the young, the ligaments are so strong and elastic that they are stripped off the bone with the labrum, rather than tearing, and do not heal back to bone. The rate of recurrence in the under 25-year-old age group is 90-100%.

As the shoulder dislocates repeatedly, **progressively more damage** is done, the bony lesions become larger, the ligaments stretch out and dislocations occur with greater ease.

Dislocations in **older patients** result in tearing of the ligaments, which may heal without any problem – the rate of recurrence is much less in older individuals. In older individuals the **associated injuries** with dislocations are more common: these *include rotator cuff tears, fractures, nerve injury and even vascular injury*

Dislocation due to **ligament laxity** causes less damage to the shoulder (it dislocates more easily the first time) and can be managed non-operatively (with rehabilitation) for longer than the post-traumatic type.

Treatment

A patient with a Bankart lesion usually needs an operation to repair the ligaments to the bone, even after the first dislocation, as the lesion usually does not heal. As mentioned above, the instabilities due to lax ligaments can at first be managed with exercise and strengthening and only need operations when the symptoms become unbearable.

Does this mean that every patient with instability needs an operation? The answer is no. If the person is willing to live with it knowing that he/she has to **avoid the position** of the arm where it slips out, and does not participate in any strenuous activities which may precipitate a dislocation, they could live with the potential instability for as long as they choose to.

On the other hand, *repeated dislocations should be avoided as the joint is gradually damaged more and more*. Also consider the fact that **certain dangerous activities e.g. sports in deep water or mountain climbing could be fatal if the shoulder dislocated under such circumstances**.

Various operations are available to stabilize an unstable shoulder:

1. Arthroscopic Bankart procedure

It is done with an arthroscope (“key-hole surgery”), although this repair can also be done with an open technique. In our unit we prefer the arthroscopic procedure:

Usually three holes measuring about 3-5 mm are made. The arthroscope and the instruments are passed through these holes (referred to as “portals”) The arthroscope relays a picture to a television monitor and the surgeon watches his actions on the monitor. (See on this website: Shoulder Surgery- Arthroscopic Surgery)



First a roughened area is made on the surface of the bone of the glenoid (socket) to allow the ligaments to heal to this area of the bone. Tiny plastic devices (“bone anchors”), with sutures attached are drilled into the bone and the sutures used to fix the ligaments to the bone of the socket. Advance techniques are used to make knots outside the joint and then passing them down the small cannulas to the inside of the joint to tie the ligaments to the bone.



The socket edge is roughened.



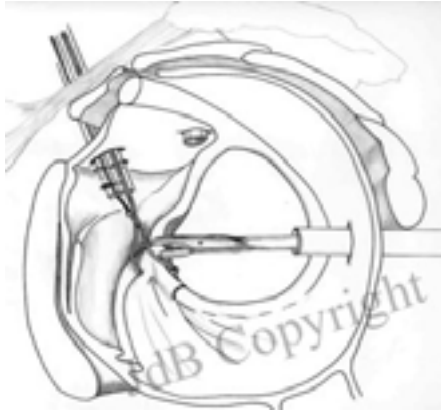
Anchors and sutures are used to reattach the torn labrum.

Arthroscopic capsular shift

In some cases the shoulder dislocates due to the ligaments being too lax and not due to tearing (Bankart lesion). This is more common in young females.

Strengthening of the surrounding muscles may improve it, but should this fail an operation may become necessary

For the cases of ligamentous laxity with instability the ligaments are tightened using the arthroscopic technique, very similar to the Bankart procedure but with more emphasis on tightening and reducing the laxity of the ligaments.



Shifting the capsule to tighten the ligaments (left). A special knot (right) devised by Dr Joe de Beer (named Nicky's Knot) is used to secure the shifted capsule in the new position till it heals.



The open Bankart and capsular shift procedures

The aim is to achieve the same as with the arthroscopic procedures, viz to repair the ligaments in the case of a Bankart lesion or tighten the ligaments in case of laxity. The difference is that an

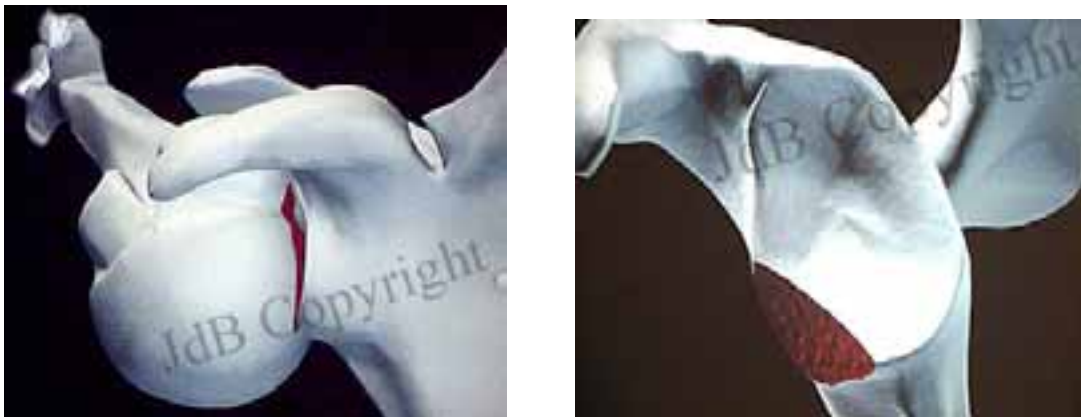
open incision is made and the subscapularis muscle may need to be cut to gain entry into the joint. The latter fact is usually the main concern about the open procedure.



The open capsular shift procedure.

The Latarjet procedure (for bony lesions)

If there is bone loss from the edge of the socket, or a large Hill-Sachs lesion (groove in the head of the humerus) the problem becomes more mechanical – referred to as an “engaging lesion” and will not be adequately treated by simply repairing the ligaments as in the Bankart procedure. The Latarjet procedure needs to be done- simply repairing the ligaments will not suffice. The coracoid, a bony outgrowth next to the joint is released and screwed on to the bony defect to fill it. The sling effect of the transferred tendon which is attached to the coracoid also plays a major role in achieving stability This is a highly successful procedure for those few cases that need it.



Above: The head “engages” against the socket (left) and this damages the socket (right).



Transfer of the coracoid to the damaged part of the socket:
The de Beer modification of the Latarjet procedure.

This operation often becomes indicated in contact sportspersons (who frequently suffer bony lesions with their dislocations during the trauma they sustain during their high impact activities) and they will usually be able to return to their previous sport at the same level following this procedure.



Xray aft



Care is taken to provide the patient with an acceptable scar. The incision is made in the skin fold and results in a scar which is hardly noticeable.

It is important to note that one of the most common reasons for the Bankart procedure to fail and the patient remaining with instability is the bony lesion not recognized and addressed by the surgeon. In such a case of failed surgery the Latarjet procedure will often rectify the problem

After the operation:

You may leave the hospital on the same or next day. Pain is usually minimal to moderate. The arm will be in a sling, simply to remind you not to move the arm upwards, backwards or outwards

Wear the sling at night while sleeping and when going out. At home it may be taken off, but remember the following restrictions:

While facing forwards and moving the arm, the hand should be visible. As soon as you move the hand backwards, out of sight, the shoulder is in a "danger zone", and the repair can be damaged.

In other words, you may move your hand in the "nose to toes" triangle.

These precautions must be followed for 3weeks, after which you will receive further instructions.

The shoulder is usually **stiff** for a few weeks following the operation but this is common and should not raise any concern

After 3 weeks

With guidance, progressive mobilization and strengthening will now be allowed. Weight training, swimming (breast stroke), etc. will be gradually introduced from 6 weeks onwards.

Return to sport

Can be allowed soon after this 6-week period, but for contact sports like rugby, and throwing sports like baseball, 3 months and more of rehab may be required.

It is important to avoid injury during the recovery period to prevent pulling out of the screws



This patient had a fall while playing “touch rugby” soon after surgery. The screws and bent and the surgery was repeated, with success.

Success Rate

The procedures mentioned above are usually successful to stabilize the shoulder and result in the patient regaining normal function, provided that the operation is tailored to the specific type of instability and is performed with the necessary expertise.