Shoulder Instability
Labrum Injuries

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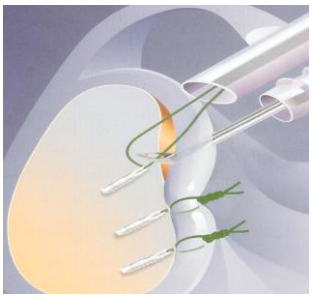
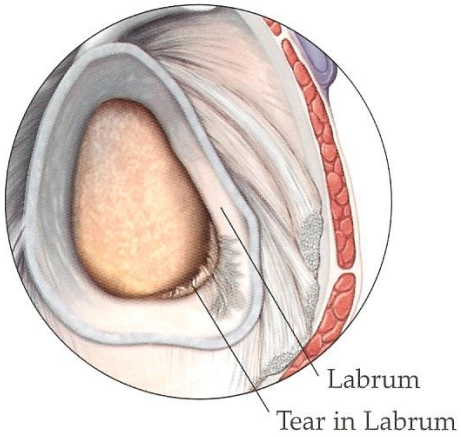


The shoulder is the most mobile joint in the body, functioning to position the hand in space, asserting control over our environment. It is this great mobility that makes the shoulder so prone to injury. A frequent analogy is to compare the shoulder (glenohumeral joint) to a golf ball on a tee. Placed on its side the ball will simply fall off the tee. To maintain its stability, the shoulder relies on a very sophisticated balance of soft tissues restraints.

While the rotator cuff is the "dynamic stabilizer" of the shoulder, the "static stabilizers" are the glenoid labrum and the capsule. The labrum is a fibrocartilaginous ring around the glenoid socket. Centrally, it is continuous with the smooth (articular) cartilage and peripherally with the joint capsule. It serves as the attachment site for the biceps tendon and the glenohumeral ligaments. The labrum helps to prevent instability by acting as a bumper and increasing the humeral head contact area with the glenoid. The labrum anchors the deepest structure in the shoulder called the capsule. The capsule is a thin layer of cloth-like tissue which is normally just loose enough to allow a large degree of motion but tight enough to resist instability. The glenohumeral ligaments are band-like thickenings in the capsule which serve as checkreins when the shoulder is forced into extremes of motion.



Proper classification of shoulder instability is the key to managing this difficult problem. The cause, degree and direction of the instability must be defined. The cause may be macrotrauma as in a contact athlete or a fall from a height. Instability may also be caused by microtrauma as in an overhead athlete, such as a baseball pitcher, in which the shoulder restraints get progressively weakened and overwhelmed.

The degree of instability may be subtle or present as a dislocation or subluxation. A dislocation occurs when the ball completely slips out of the socket requiring a reduction often in an emergency room setting and under sedation. A subluxation is defined as a symptomatic translation of the ball on the socket without complete separation and the need for a reduction.

The direction of instability is defined by the direction the ball moves in the body relative to the socket. The direction can be anterior, posterior, inferior, superior or any combination (multidirectional). Perhaps greater than 95% of acute dislocations are anterior. This occurs when a reaching arm is forced backward as in making a tackle or battling for a rebound. Patients less than 20 years old at the initial dislocation have up to a 90% recurrence rate. Posterior instability is often less obvious. It can occur from a blow to the front of the shoulder. It is commonly seen in football offensive linemen who handle their opponents with arms extended directly out in front of them. This drives the ball posterior on the socket much like a bench press maneuver which often aggravates the condition. A comprehensive shoulder examination will assess the direction and degree of laxity. Drawer tests and positions of apprehension can support the presumptive diagnosis gained by a detailed history.

In the overhead throwing athlete the instability is usually more subtle. The rotator cuff task of "dynamic stabilization" is prone to fatigue and overuse. This may cause pain secondary to inflammation or "tendonitis." Partial tearing of the rotator cuff may be a source of pain which prevents an athlete from competing at a high level. As the rotator cuff becomes overwhelmed, the shoulder may start to "stretch out." Gradual stretching of the capsule and injury to the labrum are other common sources of shoulder pain in the overhead athlete. To further complicate the issue, scarring or contracture of the posterior capsule as a result of repetitive strain during the follow-through phase of throwing may be the initiating event leading to a cascade of shoulder problems in baseball players.

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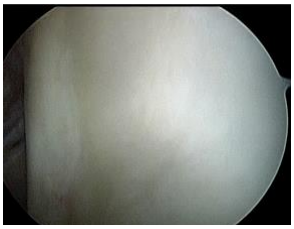
Nonsurgical treatment is successful in many painful throwing shoulders when begun early. The athlete must first reduce the offending activity to a pain-free level. A structured rehabilitation program should emphasize stretching the posterior capsule and strengthening the rotator cuff. The instructor or therapist should have a thorough understanding of the shoulder as a vital link in force generation from the legs and torso to the upper extremity. A comprehensive muscular education program should be monitored for appropriate improvements.

In treating cases of traumatic instability the natural history of the problem needs to be measured against the patient's expectations. A football linebacker who has repeated episodes of instability and desires to return to full contact without intervention is a setup for failure. A shoulder harness may assist with a midseason injury but is not a favored long term solution. Recurrent instability is a major source of progressive joint degeneration which is often difficult for the "indestructible" young athlete to fully comprehend.

Surgery may be considered if shoulder pain and instability repeatedly compromises patient comfort or function in spite of a reasonable trial of rotator cuff dynamic stabilization. Imaging studies are performed to target pathological anatomic lesions which characterize specific injury patterns. X-rays may reveal subtle bony changes or larger defects such as a Hill Sachs lesion. A Hill Sachs lesion is an impaction fracture of the posterior humeral head that occurs as the humeral head dislocates anterior and becomes lodged on the anterior glenoid rim. Since most shoulder injuries involve soft tissues that do not show up on x-ray, an MRI is often indicated. Needle introduction of dye into the shoulder greatly enhances the chances of the MRI identifying labral tears, capsular avulsions and partial rotator cuff tears (arthrogram MRI). If a tear of the labrum and/or rotator cuff is identified, the patient may be a candidate for surgery. A "normal" MRI does not strictly rule out surgery as many of the smaller lesions present in shoulder instability are difficult to identify, even on MRI.

At the time of surgery, both shoulders are examined under anesthesia to better gauge the direction and degree of instability. Side-to-side comparison is vital as many shoulders have a certain degree of laxity which is normal for that individual. Historically, shoulder instability has been addressed through large open incisions to tighten or block the shoulder from sliding out. Extensive scarring causes significant loss of motion and overtightening causes arthritis. While open repairs for shoulder instability are still needed for cases with large bony defects and capsular deficiencies, arthroscopic repair is now the standard of care for the majority of shoulder instability cases.

A small camera (arthroscope) is introduced into the back of the shoulder and the inside of the joint is systematically visualized on a television monitor. This allows for the most accurate assessment and treatment of the injured structures. A series of skin puncture holes, or "portals", are required to shave down or "debride" the torn structures. If the rotator cuff or labrum is detached from their bony insertion site, they are repaired. Typically, anchors with attached suture material are implanted in the bone. The sutures are then passed through the tissue and tied down securely. Free sutures can be used to tighten the capsule in areas that have stretched. Thermal energy, often referred to as "heat shrinkage" or "laser" surgery, has fallen out of favor due to reports of catastrophic destruction of the joint capsule.



Normal Labrum

Torn Labrum

Repaired Labrum

When compared to open surgery arthroscopic surgery has less blood loss, decreased operative time, less pain and fewer complications with an overall higher patient satisfaction rate. Whether the tissue is debrided or repaired determines the postoperative rehabilitation regimen. A simple debridement involves 2 to 3 weeks of sling immobilization - mainly for comfort purposes. After an accelerated rehabilitation program, sports may begin as early as six weeks after surgery.

A repair requires approximately six weeks of protection in an immobilizer. Early gentle motion exercises are often initiated to prevent stiffness and loss of motion. It often takes six months to allow for complete healing and rehabilitation prior to returning to strenuous activities. A motivated patient who undergoes arthroscopic surgery and complies with a well-structured rehabilitation program can expect a very high rate of success.