

Anterior Shoulder Instability

Prepared for the Patients of Orthopedic Spine and Sports Medicine by Gary Savatsky, MD

One of the most common causes of shoulder pain in young, active individuals is underlying instability. Shoulder instability, or increased, abnormal sliding of the shoulder . (Figure 1) is a common disorder in throwing athletes, weight lifters, football players and swimmers.

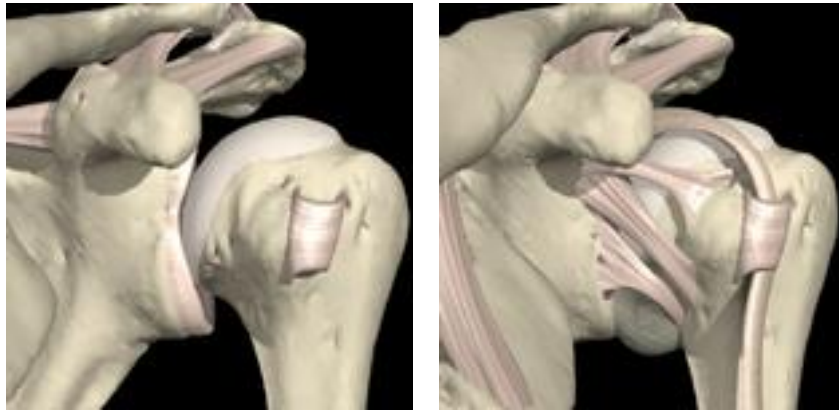


Figure 1: On the left, the humeral head and glenoid which together make up the shoulder, or gleno-humeral joint. On the right, the restraining ligaments are shown.

Instability may also occur in other sports or in work situations which require the arm to be forcefully positioned above and slightly behind the body. This alignment of the shoulder and arm relative to the body is called “*abduction and external rotation*” (Figure 2),



Figure 2: The shoulder position of *abduction, external rotation, is exemplified by the throwing position.*

This position of the arm and shoulder will normally push the humerus [shoulder bone] slightly forward [or anterior] relative to the glenoid [or socket]. In certain individuals, however, either excessive joint looseness [laxity] or actual injury to the shoulder capsule or ligaments may result in increased sliding producing pain, weakness and inability to

throw or work. This abnormal sliding when the arm is positioned in “abduction and external rotation”, is called “*anterior shoulder instability*”

Shoulder Instability

Shoulder instability ranges from small, imperceptible amounts of joint sliding to frank joint dislocation. In between these two extremes exists a third presentation of instability, called subluxations or *drop arm episodes*. Over time symptomatic individuals may experience recurrent episodes of instability as a combination of these events.

Dislocation

The first form of instability to be discussed is the most obvious and straightforward, shoulder dislocation. Dislocation occurs when the humerus slides completely off the glenoid and remains outside of the socket. Dislocations are generally violent events and usually require manipulation of the shoulder to reduce or restore the humerus into its shallow glenoid socket.(Figure 3)



Figure 3. The x-ray on the left shows the shoulder dislocated, and then relocated on the right.

As the result of dislocation the soft tissue sleeve which surround and maintain the shoulder in its joint, the capsule and capsular ligaments or labrum, are torn or severely stretched.

(Figure 4)

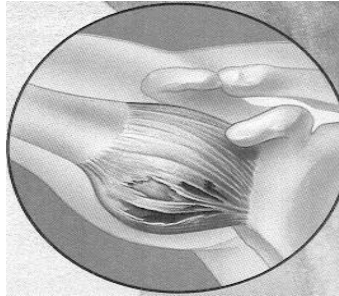


Figure 4. *Re-located shoulder with capsular tear*

Conservative versus Surgical Treatment

Unfortunately, capsular injury frequently heals poorly leaving patients at significant risk for recurrent shoulder instability. Between 50% and 75% of patients who dislocate their shoulder will unfortunately experience recurrent dislocation. Nonetheless, treatment for first time shoulder dislocation generally involves a three week period of sling immobilization in an effort to allow adequate healing, followed by a strengthening program. Individuals whose capsules or labrum heal with residual “laxity” or looseness, may experience recurrent instability and require surgical repair. In competitive athletes, who cannot afford the time needed to determine whether conservative care will be successful, early primary repair may be considered.

Subluxation

The second form of shoulder instability involves a more common and, fortunately, less profound form of shoulder instability: shoulder subluxation. During subluxation, the humeral head slides or translates across on the shallow joint surface without actually coming entirely out of its glenoid socket. Frequently, these recurrent translations [joint sliding] are so small in magnitude that they cannot be felt or appreciated by the individuals as actual joint motion. Instead, recurrent subluxation makes its presence known by producing generalized shoulder pain. In an effort to maintain joint stability the surrounding muscles and tendons of the rotator cuff are stretched and over-worked by the abnormal shoulder sliding leading to painful rotator cuff tendonitis.

Importantly, the most common cause of shoulder pain in the young athlete is shoulder instability and not, as frequently misdiagnosed, underlying rotator cuff injury, impingement or bursitis. It must be remembered that true rotator cuff injury in this age group is extremely rare, whereas instability is very common.

Drop Arm Episodes

When the shoulder subluxes violently, for example when an outfielder puts extra effort to throw the ball particularly hard, or when a football player attempts an ill advised “arm tackle” or when a tennis player over reaches too far to put away an

overhead, the humeral head may violently slide across the glenoid joint ending just short of actual dislocation. If the subluxation is profound enough the shoulder may momentarily lose all power and the arm drop painfully to the athlete's side. During this event if the shoulder presses on the surrounding nerves of the brachial plexus a period of arm numbness or burning may also be appreciated. This form of violent subluxation resulting in momentary loss of arm control, pain and occasionally numbness is called a "*drop arm episode*" and is diagnostic of underlying shoulder instability.

Causes of Shoulder Instability

The shoulder capsule can be stretched or torn by violent injury such as dislocation or a sudden powerful subluxation. On the other hand injury can also occur from repetitive micro injuries produced, for example, by the cumulative effects of years of throwing. Lastly, certain individuals are naturally very "loose jointed" and have shoulder capsules characterized by great elasticity and redundancy. It is an irony that in order to throw powerfully one must have extraordinary shoulder motion which in turn is dependant on capsular laxity: the very factor which increases the risk for developing shoulder instability.

The Position of *Abduction and External Rotation of the Shoulder*

The position of *abduction and external rotation*, as noted, exerts on the shoulder a powerful anterior sliding force. In individuals whose joint capsules are lax, either from trauma, repetitive micro injury or underlying joint laxity, the resultant anterior shoulder translation may result in pain or the appreciation of actual instability. However, if the position of shoulder *abduction and external rotation* can be avoided, instability may not occur

Unfortunately, *abduction external rotation*, is not only common to athletics, but also serves as a position of function in both activities of daily living and work. Every day maneuvers involving *abduction and external rotation* are exemplified by reaching to the back seat of a car (Figure 5), lying in bed and reaching for a lamp or phone located on a bed stand or simply reaching to put on a coat. Work related examples are seen in carrying a heavy box positioned overhead and slightly behind ones shoulder, or perhaps, wrench in hand, reaching above and slightly behind to tighten a pipe. These common maneuvers of daily life place the shoulder in *abduction and external rotation* and in symptomatic individuals, can produce the same symptoms of instability as encountered in athletics.

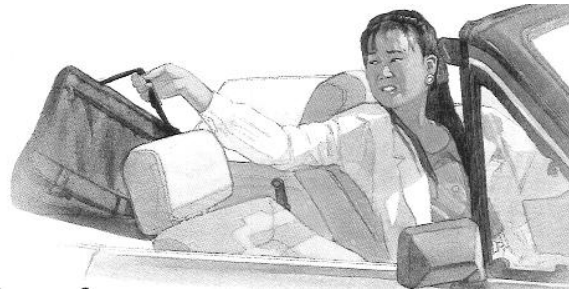


Figure 5. *Reaching backwards and placing the shoulder in abduction and external rotation*
 Figure 6. *Normal Shoulder Capsule and ligaments*



Treatment

The majority of individuals will benefit from an exercise program centered on strengthening the muscles of the rotator cuff and shoulder blade. In individuals with underlying generalized laxity but *without* traumatic capsular injury, this program is highly successful in eliminating pain or the appreciation of instability. After a history of traumatic injury, however, conservative treatment may be unsuccessful. Severe shoulder trauma frequently results in significant capsular or ligamentous [or labral] injury which may necessitate surgical repair. In these cases an MRI or MRI/Arthrogram can be helpful in identifying the presence of significant injury.



If, after a rehabilitation program and modification of activities, instability or pain persists, surgical repair to tighten the torn or stretched joint capsule or ligaments may be necessary. In particular, surgery is helpful whenever activities of daily living or work activities produce shoulder instability. On the other hand, if a specific athletic activity or sport results in instability, the choice between giving up the aggravating sport or going ahead with shoulder repair requires thought and consideration.

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