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SPORTS MEDICINE MONTHLY

Editor: Darren H. Lunow, M.Ed, ATC, LAT, Athletic Trainer

Surgical & Non-Surgical Care. Sports Medicine. Physical Therapy.

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SHOULDER INSTABILITY

Perhaps one of the most common and most prevalent injuries in overhead-dominated activities such as volleyball, baseball, and swimming; shoulder instability is a common occurrence among adolescent athletes today. Although shoulder instability is easily caused by traumatic episodes such as falling on an outstretched hand or a forced dislocation, the majority of athletes who present with shoulder instability do so as a result of repetitive overhead usage. According to the National High School Injury Surveillance Data from 2011, 54% of all the new injuries in competition in girls volleyball occur in the outside hitters and middle blockers, and 33% of all new injuries in baseball competition occur in pitchers and catchers.

As you evaluate the anatomy of the shoulder joint, it is commonly described as a ball and socket type structure. However, describing the shoulder more like a golf ball on a tee would provide a much better analogy. Unlike the hip joint, which is a true ball-and-socket joint where the socket comes around the ball by design, the humeral head more or less rests on the glenoid fossa. As a result, the shoulder joint does not have near the stability of the hip joint. Subsequently when a joint such as the shoulder, which by its nature, is less stable, is challenged with repetitive activities; it is no surprise that greater instability is often the result. As the shoulder does not have near the structural bony design of stability present in the hip, it must rely much more heavily on the cartilage and the musculature for additional stability. Therefore, these additional structures are usually noted as primary causes of shoulder instability.

Shoulder Stability and the Rotator Cuff

As previously discussed, several of the muscles around the shoulder joint, in addition to providing for the movement of the joint, also provide for substantial stability for the joint as well. To understand how muscles around a joint provide it with additional stability, you must first understand that a joint is not a static environment. For every freely movable joint in the body, certain actions and positions actually widen the joint space while others actually narrow it. This is commonly known as joint traction or joint compression. And, even though changes in these distances are exceedingly minimal, it is easy to see how joint compression stabilizes a joint whereas joint traction destabilizes a joint. Adding to this thought, if you can now understand that a group of muscles which "cuff" or surround a joint can assist in providing additional joint compression, then understanding muscular-based joint stability is a cinch. In other words, as the rotator cuff (RTC) anchors on the shoulder blade and its musculature and tendons work to surround the humeral head, it has the mechanical positioning to compress the two together. This is the function of the Rotator Cuff.

So when developing a preseason strength and condition program, consider the addition of a focused rotator cuff strengthening program as well. In fact, we have created a Shoulder, Forearm, and Wrist Strengthening Program for the overhead athlete on our website: *www.csosortho.com*.

Just look for the Thrower's Ten Program under the Home Exercise Programs Section. By increasing strength in the RTC, you subsequently increase stability in the shoulder.

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Labral Tears

Recalling the previous example of the shoulder joint as being described more as a golf ball on a tee rather than a ball and socket, now think of the labrum as a structure that deepens the entire rim of the tee. The labrum is a thick piece of cartilage that does just that; it deepens the entire rim of the shoulder socket. By deepening the space available for the humeral head to sit in the glenoid rim, the labrum increases the overall contact area between the humerus and the glenoid. And, in stability terms, greater surface contact equals greater stability.

Additionally many are unaware that the labrum also helps to create a negative pressure (i.e. vacuum) environment that actually "suction cups" the humeral head into the joint. Although the labrum does not provide for the actual vacuum itself, it does provide for the mechanical structure whereby a vacuum can exist. In doing so, the labrum provides for an additional feature that assists in maintaining joint stability. Not only does it increase the contact surface area between the glenoid and the humerus, but it actually helps to pull the humeral head into the glenoid by providing for an intact suction ring around the humeral head as it comes in contact with the glenoid.

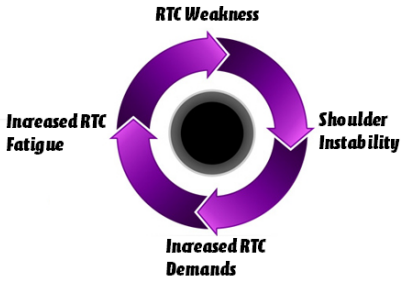
Although stability can and does exist in the shoulder joint that has a partial labral tear, it is subsequently lessened. And, although some instabilities that come as a result of small labral tears can be overcome with RTC strengthening, tears to the glenoid labrum can be sometimes difficult to overcome for an athlete who competes in a repetitive overhead activity.

Rotator Cuff Tendinitis

The causes of onset for a tendonitis is basically the same, regardless of where it may occur in the body. For the rotator cuff (RTC), one of the following usually plays a part.

Poor Progression:
If you want to prevent a vast majority of sports-related injuries, there's one word you need to apply; progression. The RTC is no exception. Athletes should progress into a throwing or overhead sport over a period of months. Progressive increases in duration and intensity are a must, and attention to rest is vital.

Rotator Cuff Weakness:
When the RTC is weak, the shoulder is less stable. The brain actually detects this instability and recruits the RTC to work even harder to provide for additional stability. Therefore a slippery slope is created.



Rotator Cuff Overuse:
When any muscle is overused it fatigues, and a fatigued muscle statistically has a greater likelihood for subsequent injury. For every day of hard overhead activity, longevity in a sport is best guaranteed by a subsequent rest of 1-2 days from that specific activity.

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