Role of the Biceps Pulley in Shoulder Pain

New Information on the Role of the Biceps Pulley in Shoulder Pain

You've probably never heard of the biceps pulley system. But anyone who has had a rotator cuff tear or who has pain along the front of the shoulder may, in fact, have a lesion (tear or damage) of the biceps pulley.

What is this biceps pulley? The full name of the pulley mechanism is biceps reflection pulley. It is a sling of soft tissue fibers made from surrounding shoulder ligaments and tendons of the shoulder rotator cuff. The sling helps keep the biceps tendon inside a groove in the humerus (upper arm bone) along the front of the upper arm and shoulder.

Disruption of the biceps pulley (usually from a rotator cuff tear) allows the biceps tendon to sublux (partially shift out of the groove) or dislocate (pop out fully). The result can be anterior shoulder pain (along the front of the upper arm) and/or shoulder instability.

In this study, surgeons who were already performing arthroscopic examination and/or arthroscopic surgical repair of shoulders took a close look at the biceps pulley mechanism of each patient. The study included 229 patients who were treated for a variety of shoulder problems (e.g., rotator cuff tears, osteoarthritis, instability). Adults of all ages (ranging from 18 to 76 years) were included.

Everyone was examined by the surgeon in the clinic before surgery. Shoulder motion was evaluated. The presence, location, and intensity of pain were recorded with each shoulder motion and shoulder position tested. The results of these dynamic tests of shoulder function were later compared with arthroscopic findings. Making this type of comparison helps surgeons know which clinical tests are reliable.

They found that one-third of the group did, indeed, have a biceps pulley lesion. In most cases, the biceps pulley lesion was present when the patient had a rotator cuff tear and SLAP lesion.

SLAP refers to a superior labral anterior-posterior tear. The labrum is a rim of fibrous cartilage around the shoulder socket. This little extra lip helps keep the shoulder in the socket. The SLAP lesion refers to a labral tear at the top of the socket (that's what superior means) that goes from the front (anterior) to the back (posterior) of the socket.

The biceps tendon is intimately linked with the labrum because it attaches along the upper front area of the socket. In some SLAP lesions, the biceps tendon is also pulled away from the bone. In this study, one third of the torn pulleys still had an intact (undamaged) biceps tendon. Almost 80 per cent of the entire group had a biceps pulley tear and a rotator cuff tear at the same time.

Another important (and surprising) finding in this study was the fact that dynamic shoulder tests with the arm positioned in 30 and 60-degrees of shoulder abduction and internal/external rotation were not needed to detect a pulley lesion. Testing the arm in a neutral position gave just as much and just as good of information as adding this extra test position.

The authors conclude that surgeons may not always be aware of the biceps pulley system. The loss of this restraining mechanism may contribute to continued shoulder pain after repair of a torn rotator cuff tendon. A proper inspection of the biceps pulley is advised. Repair of this anatomic feature may improve surgical

outcomes.

Future study of this biceps pulley mechanism is needed to find out which comes first: degeneration and disruption of the pulley system or rotator cuff lesions? Since many of the biceps pulley lesions were in older adults, it may be that an injury to the biceps tendon leads to disruption of the pulley mechanism.

The end result may be weakening of the rotator cuff with eventual damage there as well. On the other hand, seniors are also at increased risk of rotator cuff tendon degeneration and disruption, which could create the chain of events that leads to biceps pulley lesions.

Reference: Sepp Braun, MD, et al. Lesions of the Biceps Pulley. In The American Journal of Sports Medicine. April 2011. Vol. 39. No. 4. Pp. 790-795.