

## A Different Look at Rotator Cuff Tears

In this study, orthopedic surgeons from Germany take a closer look at an unusual rotator cuff tear. The rotator cuff is formed by the tendons of four muscles: the supraspinatus, infraspinatus, teres minor, and subscapularis. Most of the time, the supraspinatus and/or infraspinatus are affected by a rotator cuff tear. Much less often, the teres minor and subscapularis are torn.

An isolated tear of the subscapularis tendon in 21 patients treated with arthroscopic surgery is the focus of this report. The rotator cuff tendons are key to the healthy functioning of the shoulder. They are subject to a lot of wear and tear, or degeneration, as we use our arms.

Tearing of the rotator cuff tendons is an especially painful injury. A torn rotator cuff creates a very weak shoulder. A strong subscapularis tendon/muscle unit is needed to hold the head of the humerus (upper arm bone) in the center of the shoulder socket.

Normal shoulder joint biomechanics and kinematics (movement) depend on an intact subscapularis muscle. Without a normal, healthy (strong) subscapularis muscle/tendon unit, the risk increases for shoulder subluxation (partial dislocation) or full dislocation.

And just as the expression "use it or lose it" suggests, a torn rotator cuff tendon that is no longer connected to the joint becomes atrophied (wasting away). The damaged area starts to fill in with fat cells, a process called fatty infiltration. Over time, the result of muscle atrophy and fatty infiltration is weakness or insufficiency.

The question this study attempts to answer is what are the results of surgical treatment for an isolated subscapularis tendon tear? Isolated means the subscapularis is the only part of the rotator cuff that is torn -- not the usual infraspinatus or supraspinatus but just the subscapularis.

Shoulder function was assessed after arthroscopic surgery and MRIs taken to capture the state of the healing tendon. Two clinical signs used to test the integrity of the subscapularis muscle (the lift-off and belly-press tests) were also compared from before to after surgery.

The surprising finding from this study was that although 20 of the 21 patients had an intact repair and improved strength, one-fourth of those same patients had atrophy (wasting) of the upper portion of the subscapularis muscle. The second half of the surprise was that none of these patients had any functional losses because of the muscle weakness.

Only one patient had a re-rupture, which could be seen on an MRI as a fluid-filled gap between the end of the tendon (called the tendon stump) and the bone where it should normally attach. And despite the re-rupture, this patient was satisfied with the results of surgery.

Anyone with a positive belly-press test had subscapularis muscle atrophy. The belly press test was measured by having the patient press the hand of the affected arm against his or her abdomen. A special electronic plate placed against the belly could measure the amount of pressure applied by the hand and determine whether or not there was subscapularis weakness or insufficiency.

The authors concluded that the severity of subscapularis tears was not as predictive of outcomes as the time between trauma and surgery. The longer the wait between subscapularis tears and repair, the greater likelihood of less optimal results. A bigger gap between injury and surgery gives more time for the body to

fill in with fatty infiltration.

They also suggested that arthroscopic surgery for this group of patients yielded good early results. A longer follow-up period will show whether or not reruptures are common after arthroscopic repair of isolated subscapularis tendons. Other future studies are needed to compare the results of isolated subscapularis tendons between arthroscopic versus open incision repairs.

Reference: Christoph Bartl, MD, et al. Subscapularis Function and Structural Integrity After Arthroscopic Repair of Isolated Subscapularis Tears. In *The American Journal of Sports Medicine*. June 2011. Vol. 39. No. 6. Pp. 1255-1262.