

A New Look At Rotator Cuff Tears

Why are some rotator cuff tears (RCTs) painful while others are not? And what makes them convert from a pain free (asymptomatic -- without symptoms) to a symptomatic tear? If we knew the answers to these questions, we might be able to prevent rotator cuff tears from getting worse and becoming painful.

Identifying factors linked with pain development in previously asymptomatic rotator cuff tears is the subject of this article. It's actually an early report on the work being done by a group of orthopedic surgeons. This preliminary report comes from the Washington University School of Medicine in St. Louis, Missouri.

The rotator cuff is a group of four muscles and their tendinous attachments that surround the shoulder in the socket. They provide both stability (to hold the head of the humerus in the socket) and strength for smooth and controlled movement.

The surgeons involved in this study found 195 patients with an asymptomatic rotator cuff tear. They followed these folks over a period of time to see what would happen. Eventually, the group formed two groups naturally. Patients who started to have pain were placed in one group. The patients who continued pain free were considered the second group.

By comparing the two groups, it was possible to see differences that might explain who develops a painful rotator cuff tear and why that happens in some people but not others. Data was collected using X-rays and ultrasound imaging of the shoulder joint.

Ultrasound studies are helpful because they show tear progression and fatty degeneration of the rotator cuff muscles. Tear progression refers to tears that go from being partial (not all the way through the tendon) to full-thickness (complete rupture).

Tear progression also describes tears that increase in length or width by more than five millimeters. Fatty degeneration refers to the body's attempt to heal the tear by filling in with fat deposits.

Range-of-motion and muscle strength were also assessed. Shoulder function before and after was measured using a tool called the American Shoulder and Elbow Surgeons Score.

Everyone in both groups had a painful rotator cuff tear in one shoulder. A symptom-free tear was found in the other shoulder, which qualified them to be in this study. There was no known injury or trauma causing the tears. Most of the patients were older (over 60 years old) when the rotator cuff tears were diagnosed.

Everyone was followed for at least six months before these results were compiled and reported. For those who were in the study longer, measurements were taken every 12 months. Some patients were in the study for as much as five years. Everyone in the study was asked to report any time pain developed that was rated as three or more on a scale from zero (no pain) to 10 (worst pain) that lasted six weeks or more.

Taking everything into consideration, the authors made the following observations:

At the start of the study, fatty degeneration was only seen in patients with painful full-thickness tears. Over time, there was more evidence of fatty infiltration (filling in) for patients in both groups.

Pain develops as rotator cuff tears progress. Changes in tear size (getting larger) was a signal that pain would become a reality for that very soon (if not already present).

The larger the tear at first, the greater the chances of pain developing.

Rotator cuff tears on the dominant hand side are more likely to develop painful symptoms.

Shoulder motion and function start to decline when pain begins.

Fatty infiltration is not a sign that shoulder pain will begin.

Changes in the way the shoulder moves (called arthrokinematics) were noticed more often in patients with advanced stages of rotator cuff tears.

Arthrokinematics were more likely to be disrupted when the infraspinatus muscle (one of the four rotator cuff muscle/tendons) was torn.

The authors concluded that these findings have direct clinical applications. Their next step is to see if the loss of shoulder motion can be predicted and prevented. Future studies can also look at the specific size of rotator cuff tears and see if there is a cut off size.

In other words, is there a specific length, depth, and width of tear size that always predicts worsening of symptoms? If so, it might be possible to intervene with treatment before small tears progress to large tears. And of course, that brings up the question of what kind of treatment should be prescribed? That will be the topic of future studies as well.

Reference: Nathan A. Mall, MD, et al. Symptomatic Progression of Asymptomatic Rotator Cuff Tears. In *The Journal of Bone and Joint Disease*. November 17, 2010. Vol. 92A. No. 16. Pp. 2623-2633.