

Biomechanical Comparison of tissue tear-through risk: LabralTape and #2 FiberWire

Arthrex Research and Development

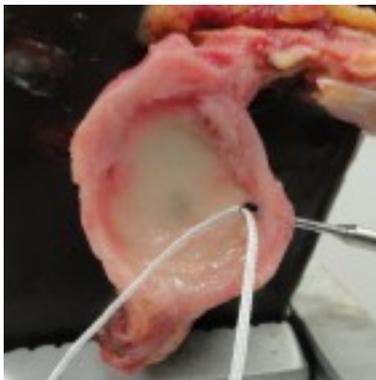
Objective

Determine if LabralTape has a biomechanical advantage over #2 FiberWire, when used for a glenoid labrum repair.

Methods and Materials

Three matched pairs of cadaver glenoids were stripped of all soft tissue, save the labrum, and each sample was potted in fiberglass resin. A 90° SutureLasso was used to pass a simple stitch of suture through the intact labrum at the level of the glenoid articular surface, as shown in Figure 1.

Figure 1: A LabralTape sample being passed through the labrum for a simple-stitch SLAP repair.



One strand of LabralTape and one strand of #2 FiberWire were passed through the labral tissue of each glenoid sample. Suture passes were alternated between the 3:00, 5:00, 7:00, and 9:00 positions (relative to the right glenoid).

Mechanical testing was performed using an INSTRON 8871 Axial Table Top Servohydraulic Testing System (INSTRON, Canton, MA), with a 5kN load cell attached to the cross-head. The potted specimens are secured to an adjustable angle fixture so that the direction of pull would be parallel to and away from the glenoid face, as shown in Figure 2. The free ends of suture were secured to the cross-head with a pneumatic clamp.

Figure 2: The sutures were pulled parallel to and away from the glenoid surface.



Results

The maximum load for the LabralTape samples was $279 \pm 53\text{N}$, and the maximum load for the #2 FiberWire samples was $203 \pm 12\text{N}$. The mode-of-failure for all samples was the suture tearing through the labral tissue. A paired t-test was performed to compare the maximum loads of the two suture types. The LabralTape has a significantly greater maximum load than that of the #2 FiberWire ($p = 0.017$).

Discussion and Conclusions:

The results of this testing indicate that LabralTape is 37 percent more resistant to tearing through tissue, when compared to #2 FiberWire. The larger maximum loads of the LabralTape may be due to the larger surface area of the suture, which could distribute loads over a wider area.