Biomechanical Testing Summary:
Ultimate Failure Load of TenoLok™ Tenodesis Anchor

Overview

Summary of the ultimate failure load of TenoLok™ Tenodesis Anchor for proximal biceps tenodesis.

Anchor	Anchor Size (pre-deployment)	Anchor Size (after deployment)	Drill Hole Size
TenoLok Tenodesis Anchor 5.0	5.0 mm	6.5 mm cortical 8.0 mm subcortical	7.0 mm
TenoLok Tenodesis Anchor 6.0	6.0 mm	7.5 mm cortical 10.0 mm subcortical	8.0 mm

Table 1: Properties of two anchors tested.

Methods

Holes were drilled into 40/12.5 pcf foam bone (Pacific Research Laboratories) using cannulated Badger reamers. A 7.0 mm hole was drilled for the TenoLok 5.0 and an 8.0 mm hole for the TenoLok 6.0. All holes were 20 mm deep. The suture loop from the TenoLok was placed over a synthetic tendon (5.0 mm diameter) and secured 20 mm proximal to the hole. Anchors were implanted so that the laser line of the driver was flush with the cortex. The anchors were deployed, thus locking the tendon in the bone. The suture was uncleated and removed to ensure the data collected was based solely on the direct fixation strength of the anchor.

The synthetic tendons were secured to a calibrated MTS machine at 90° to simulate the directional pull of the biceps tendon. Tendons were cycled from 10-90 N for 5000 cycles at 1 Hz, then pulled to failure at 50 mm/min.

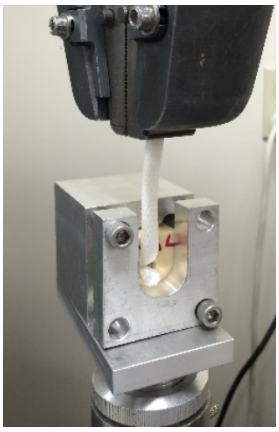
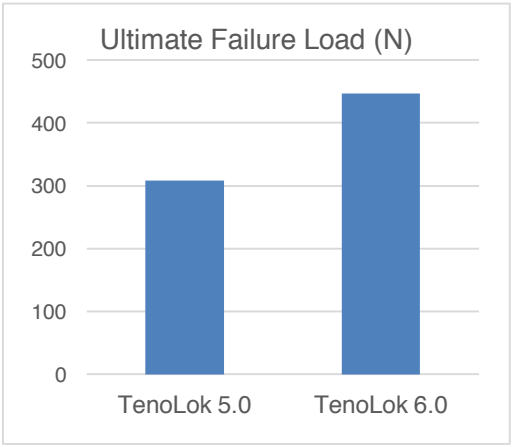


Figure 1: Tendon loaded at 90° on MTS machine.

Results

The TenoLok Tenodesis Anchor exhibited the following ultimate failure load:

- TenoLok 5.0: 308.4 ± 43.5 N[1]
- TenoLok 6.0: 446.3 ± 42.0 N[1]



Clinical Relevance

The TenoLok Tenodesis Anchor has adequate fixation for proximal biceps tenodesis and may help with reduced tendon damage and tendon wrap when compared to interference screws. The ultimate failure load of interference screws for biceps tenodesis in cadaver has been shown to be in 147.0-218.3 N[2] and 254.4 N[3] in two different studies.

[1] Data on file.
[2] Patzer, T, Rundic JM, et al. Biomechanical Comparison of Arthroscopically Performable Techniques for Suprapectoral Biceps Tenodesis. *Arthroscopy* 2011;27:1036-1047.
[3] Chiang, FL, Hong CK, et al. Biomechanical Comparison of All-Suture Anchor Fixation and Interference Screw Technique for Subpectoral Biceps Tenodesis. *Arthroscopy* 2016;1:e1-e6.