

# Presutured Allograft GraftLink: Biomechanical Testing

Arthrex Research and Development

## Objective

Determine biomechanical strength of presutured, sterilized and packaged Allograft GraftLinks for All-Inside ACL Reconstruction.

## Methods and Materials

Fifteen grafts were prepared, sterilized, packaged and frozen by LifeNet Health (Virginia Beach, VA). Prior to testing, the grafts were thawed in a tepid water bath. A BTB TightRope (AR-1588BTB) was strung through the looped end of the GraftLink closest to the whipstitch sutures. One of the whipstitch sutures was pulled through a hole in the TightRope Button.

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 TightRope Button was secured to the testing surface through a 4 mm hole in a metal plate, and the opposite side of the graft was suspended from the cross-head by a dowel rod. The TightRope tensioning sutures were pulled firmly to tension the graft, and the whipstitch sutures were tied over the button. The testing setup is shown in Figure 1.

A 30 mm gauge length was used for the TightRope for each sample. Each sample was precycled from 10 to 50 N at 1 Hz for 10 cycles to remove slack from the system. This was followed by cycling between 50 and 250 N at 1 Hz for 500 cycles. Post cycling, a pull-to-failure was conducted at 20 mm/min. Load and displacement data were recorded at 500 Hz. The ultimate load was determined from the INSTRON data for each sample and the mode of failure was observed. Furthermore, digital video tracking was used to determine the cyclic elongation of the graft itself.

**Figure 1:** A sample prepared for testing.



## Results

The ultimate load of the Allograft GraftLink samples was  $994 \pm 96$  N, and the predominant mode of failure (13 of 15) was suture breaking. One sample had a mode of failure of the TightRope suture slipping and one graft was torn by the whipstitch sutures. The cyclic displacement of the graft, found using video tracking, was  $1.7 \pm 0.5$  mm.

## Discussion

A presutured Allograft GraftLink can provide decreased operating room time for ACL reconstructions. The results of this testing demonstrate that the construct is mechanically robust and strong enough for postoperative therapy.