FiberTak® Button vs Proximal Tenodesis Button: A Performance Comparison

Arthrex Research

OBJECTIVE

The purpose of this study was to compare the ultimate loads between the FiberTak button and proximal tenodesis button in a 20/40 lbf/ft^3 foam block.

METHOD AND MATERIALS

A 20/40 lbf/ft^3 foam block was cut into twelve 40 mm × 40 mm blocks. The blocks were secured in a vise with the cortical layer facing down.

Proximal Tenodesis Button

Six blocks (n = 6) were drilled with a 3.2 mm drill bit through the cortical surface. A 32 mm-deep tunnel was reamed in all blocks. #2 FiberWire® suture was looped around the web of the proximal tenodesis button. The inserter was placed in the tunnel and pushed through with a mallet. The button was released from the inserter and the suture was pulled and tensioned to secure the button to the cortical surface.

FiberTak Button

Six blocks (n = 6) were drilled with a 2.6 mm spade-tip drill through the cortical surface. A 32 mm-deep tunnel was reamed in all blocks. The FiberTak button inserter assembly was placed in the tunnel and pushed through with a mallet. The shuttling sutures were released and one of them was removed. A #2 FiberWire suture was fed through the loop of the remaining shuttling suture and pulled through the FiberTak button sheath. The FiberWire suture was used to tension and bunch the button onto the cortical surface.

Testing was performed using an Instron 5544 Tensile Tester, with a 2 kN load cell attached to the crosshead. A pneumatic clamp was secured to the crosshead with an aluminum box fixture secured to the base of the load frame. The foam blocks were placed under the box fixture and the suture was secured in a pneumatic clamp with a gauge length of 12.7 cm.

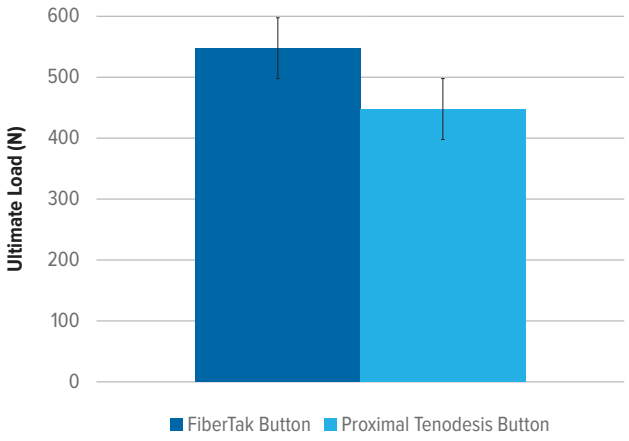
A preload of less than 5 N was applied. Each sample was pulled to failure at 20 mm/min. Load and displacement data were recorded at 500 Hz. The ultimate load and mode of failure were recorded for each sample.

Normality and equal variance were obtained (tested with Shapiro-Wilk and Brown-Forsythe tests, respectively); therefore, a *t* test was performed to check for significance. The significance level was set to $\alpha = .05$. Statistical analyses were performed on SigmaPlot version 13.0 (Systat Software Inc).

RESULTS

The ultimate load of the proximal tenodesis button samples was 450 ± 39 N, and the most common mode of failure (n = 5 of 6) was the suture breaking. The ultimate load of the FiberTak button samples was 528 ± 49 N, and the mode of failure (n = 6) was the suture breaking. The ultimate loads are illustrated in Figure 1.

Figure 1. Ultimate load comparison between the FiberTak button (n = 6) and proximal tenodesis button (n = 6).



There was a statistically significant difference between the two groups in ultimate load ($P = .013$).

CONCLUSION

These results demonstrate that the FiberTak button has a statistically higher ultimate load compared to the proximal tenodesis button. This time zero biomechanical test provides evidence that the FiberTak button is a suitable alternative to the proximal tenodesis button.

Reference

1. Arthrex, Inc. Data on file (APT-04066). Naples, FL; 2019.

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