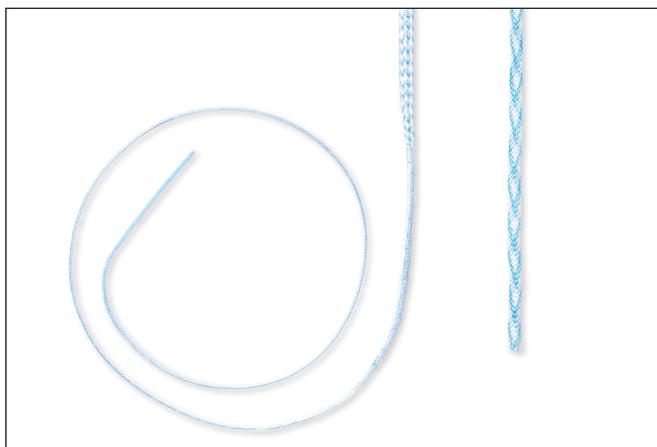


# Tissue Pull-Through Resistance of FiberTape® Suture and ULTRATAPE: Side by Side Biomechanical Comparison Testing

Arthrex Research and Development

## Objective

The purpose of this testing is to compare the resistance to tissue pull-through of two suture tape products, FiberTape (Arthrex, Inc., Naples, FL) and ULTRATAPE (Smith & Nephew, Inc., Andover, MA), as shown in Figure 1.



**Figure 1:** Arthrex FiberTape, with a #2 suture tail (left), and S&N ULTRATAPE without tails (right).

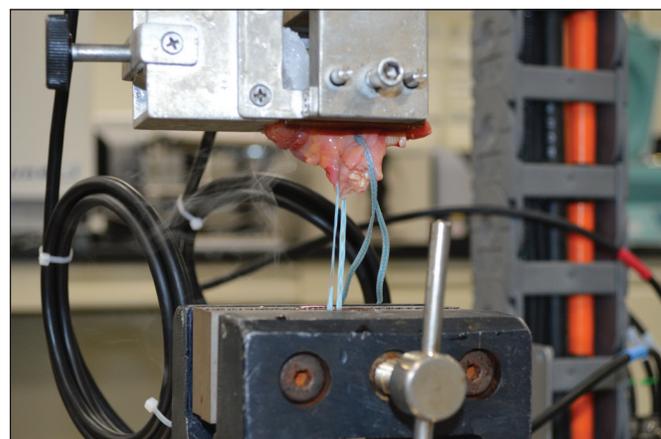
## Methods and Materials

Fresh frozen cadaveric subscapularis tendons were used for this testing. Samples with evidence of calcification, existing tears, or other visible damage were discarded. A sample of the ULTRATAPE (REF: 72203897) and FiberTape (AR-7237-7) were passed through each tendon in a simple stitch configuration, alternating the superior and inferior relationship between the sutures. The ULTRATAPE does not have #2 tails, making it more difficult to pass directly using a Scorpion™ suture passer, so the tapes for both sample groups were shuttled through the tendon using a #2 FiberLink™ suture (AR-7235) and a FastPass Scorpion™ SL suture passer (AR-13999MF). Each pass was 8-10 mm from the lateral tendon edge and they were spaced 8-10 mm apart, as shown in Figure 2.



**Figure 2:** A subscapularis tendon with simple stitches of FiberTape (above) and ULTRATAPE (below).

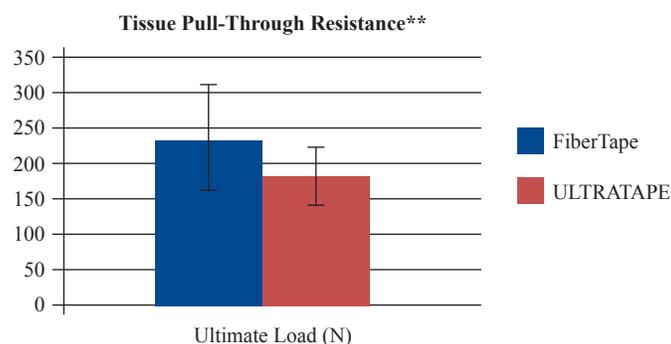
Biomechanical testing was performed using an E10kN INSTRON®\* ElectroPuls™ materials testing machine with a 1kN load cell attached to the cross-head. The proximal end of the tendon samples were secured to the cross-head using a custom freeze clamp and dry ice, while the suture tails were captured in a vise grip fixture. The testing setup is shown in Figure 3. One suture type was tested at a time, alternating the order between tendon samples. Care was taken to observe any damage to the tendon in the proximity of the second suture prior to testing. A pull-to-failure of each suture was performed at 33 mm/sec.



**Figure 3:** A tendon sample secured to the cross-head with the freeze clamp and dry ice, and the suture tails of one sample clamped in the vise grip.

## Results

The results of the testing are shown in Figure 4, and listed in Table 1. A paired t-test was used to compare the ultimate loads of the two groups. The greater ultimate load of the FiberTape ( $233 \pm 75\text{N}$ ) was significantly different from that of the ULTRATAPE ( $184 \pm 40\text{N}$ ) ( $p = 0.043$ ).



**Figure 4:** The ultimate load of two suture tape products.

\*Registered by respective owner  
\*\*Data on file

**Table 1:** Ultimate loads of the suture pull-through testing of two suture tapes.

<b>Suture Pull-Through Testing - Subscapularis Tendon*</b>					
<b>Arthrex FiberTape®</b>			<b>S&amp;N ULTRATAPE</b>		
Donor	Side	Ultimate Load (N)	Donor	Side	Ultimate Load (N)
F151080	R	146	F151080	R	130
F151080	L	389	F151080	L	216
L151079	R	298	L151079	R	159
L151079	L	209	L151079	L	218
S151768	R	314	S151768	R	219
C151136	R	137	C151136	R	239
C151136	L	254	C151136	L	190
L150924	R	216	L150924	R	191
L150924	L	272	L150924	L	182
P150037	R	187	P150037	R	130
P150037	L	188	P150037	L	210
L151497	R	182	L151497	R	119
<b>Average</b>		<b>233</b>	<b>Average</b>		<b>184</b>
<b>St Dev</b>		<b>75</b>	<b>St Dev</b>		<b>40</b>
<b>Paired t-test p-value</b>					<b>p = 0.043</b>

**Conclusion**

FiberTape requires greater than 26% more force to pull through the tendon than ULTRATAPE.