

Achilles Midsubstance SpeedBridge™ System vs. Krackow for Midsubstance Achilles Tendon Rupture Repair

Arthrex Research and Development

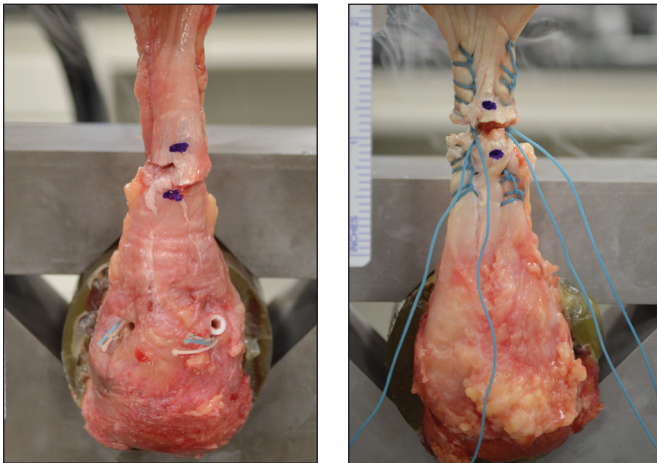
Objective

The purpose of this matched pair cadaveric study was to compare two midsubstance Achilles tendon repairs in gap formation and ultimate load: Achilles Midsubstance SpeedBridge versus Krackow.

Methods and Materials

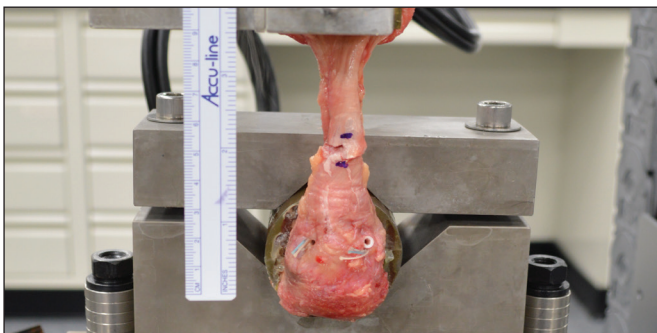
Five matched pair of fresh frozen cadaveric feet with a mean age of 56.6 were used for testing. Repairs were randomized amongst the matched pairs of Achilles tendons. Midsubstance ruptures were created approximately 4 cm from the calcaneal insertion. Standard Achilles Midsubstance SpeedBridge and Krackow techniques were used for each repair (Figure 1).

Figure 1: Achilles Midsubstance SpeedBridge (left) vs. Krackow (right)



The calcanei were secured to the base of an Instron® testing system (Instron, Canton, MA), and the proximal Achilles tendons were held firmly in a cryo-grip approximately 5 cm from the rupture (Figure 2).

Figure 2: Cyclic Test Setup



The repairs were precycled from 20-100 N for 10 cycles at 1 Hz, then cycled from 20-100 N for 1,000 cycles at 1 Hz. Following cycling, a tensile load to failure at a rate of 25.4 mm/sec was applied. Markers were placed on either side of the rupture and a digital video camera was used to record cyclic displacement of the tendons.

Results

The results from cyclic testing are demonstrated in Figure 3. The Achilles Midsubstance SpeedBridge cyclic displacement at 10 cycles, displacement at 500 cycles, and ultimate load were statistically equivalent to the Krackow cyclic displacement and ultimate load ($p = 0.719$, $p = 0.063$, and $p = 0.305$, respectively). However, the lesser cyclic displacement of the Achilles Midsubstance SpeedBridge at 1,000 cycles was statistically significant ($p = 0.016$).

Conclusion

The Achilles Midsubstance SpeedBridge technique has statistically less displacement at 1,000 cycles than the Krackow technique for midsubstance Achilles tendon ruptures. The Krackow repair has an ultimate load of 284 ± 115 N, as compared to the Achilles Midsubstance SpeedBridge repair of 386 ± 117 N.

Figure 3: Cyclic Displacement

