

# Arthrex *Internal/Brace*™ Ligament Augmentation Procedure Versus Smith & Nephew Knotless Constructs for Lateral Ankle Repairs

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## Objective

Determine the biomechanical differences on lateral ankle repair between an Arthrex *Internal/Brace* ligament augmentation procedure and a Smith & Nephew construct.

## Methods and Materials

Five matched pairs of cadaver ankles were used for this testing (average age = 57 years; all male). The specimens were dissected to expose the lateral ankle joint. The tibiae were removed, and an 8 mm hole was drilled through the fibula, proximal to the lateral malleolus.

All repairs were performed by Troy Watson, MD. Group 1 repairs were performed using SwiveLock® anchors, FiberTape® suture, and instrumentation contained in Arthrex's *Internal/Brace* Repair Kit (AR-1688-CP). Group 2 repairs were performed with Smith & Nephew's Healicoil and Bioraptor™ anchors, Ultratape, and instrumentation. The implants for all groups were inserted according to published surgical techniques with the recommended instrumentation. All other soft tissue connecting the fibula to the talus was transected.

Mechanical testing was performed using an Instron®\* machine with a 10 kN load cell. Samples were mounted on custom jigs designed to hold the foot in 20° of inversion and 10° of plantar flexion. A dowel pin was inserted through the 8 mm fibular hole to allow for superiorly directed loads to be applied to the repair, as shown in Figure 1. Samples were loaded to failure in tension at 20 mm/min.



Figure 1. Sample prepared for mechanical testing

\*Instron is a registered trademark of Illinois Tool Works Inc

## Results

The ultimate load of the construct created using the *Internal/Brace* procedure was  $249 \pm 47$  N, and the ultimate load of the Smith & Nephew constructs was  $90 \pm 17$  N. A paired t test was performed to compare differences between the 2 sample groups. The ultimate load of the *Internal/Brace* repair was significantly greater than that of the Smith & Nephew construct ( $P = .001$ ). The results are shown in Figure 2.

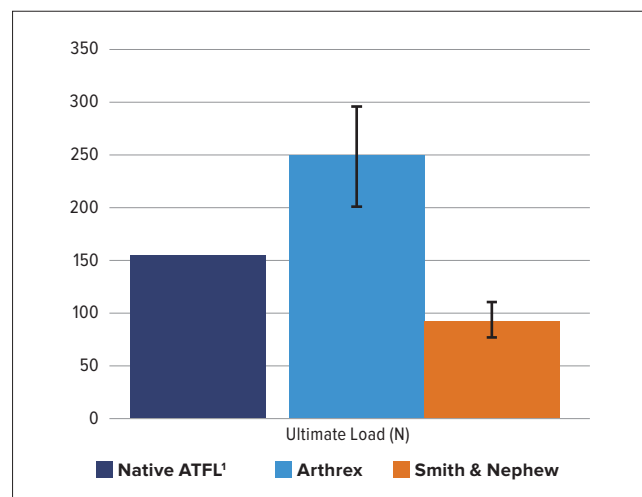


Figure 2. Mechanical testing results

## Conclusions

We conclude that the Arthrex *Internal/Brace* procedure produces a biomechanically superior repair compared to the Smith & Nephew construct. At time zero, the Smith & Nephew construct offers significantly less strength than that of the native ATFL and Arthrex *Internal/Brace* repair, 154 N and 250 N, respectively.<sup>1,2</sup> The lack of strength of the Smith & Nephew repair draws into question its validity as a solution to lateral ankle instability.

The *Internal/Brace* surgical technique is intended only to augment the primary repair/reconstruction by expanding the area of tissue approximation during the healing period and is not intended as a replacement for the native ligament. The *Internal/Brace* technique is for use during soft tissue-to-bone fixation procedures and is not cleared for bone-to-bone fixation.

## References

1. Viens NA, Wijdicks CA, Campbell KJ, LaPrade RF, Clanton TO. Anterior talofibular ligament ruptures, part 1: biomechanical comparison of augmented Broström repair techniques with the intact anterior talofibular ligament. *Am J Sports Med.* 2014;42(2):405-411. doi:10.1177/0363546513510141
2. Waldrop NE, Wijdicks CA, Jansson KS, LaPrade RF, Clanton TO. Anatomic suture anchor versus the Broström technique for anterior talofibular ligament repair: a biomechanical comparison. *Am J Sports Med.* 2012;40(11):2590-2596. doi:10.1177/0363546512458420