

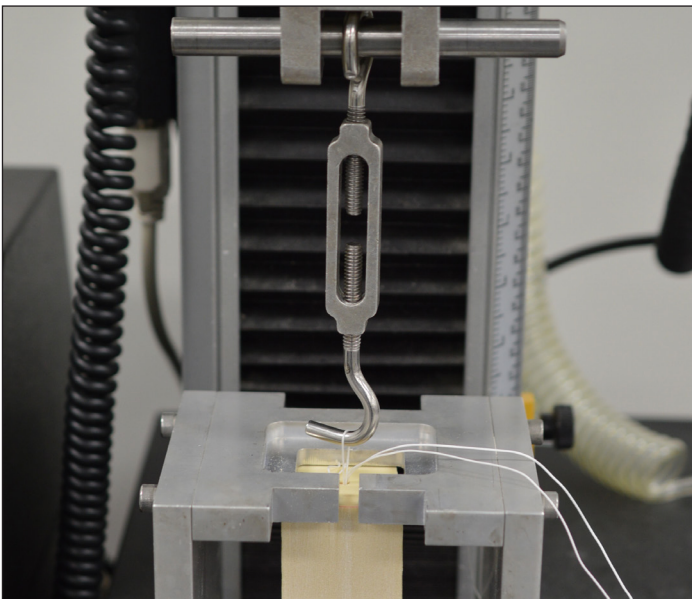
Pullout Strength of Various Knotless Hip Suture Anchors

Arthrex Research and Development

Test Objective

Determine and compare the pullout strength of 3 PEEK knotless anchors indicated for use in acetabular labral repair of the hip. The anchors to be studied are the Arthrex 2.4 mm Mini Hip PushLock® anchor with SutureTape, the Smith & Nephew 2.9 mm BioRaptor™ knotless anchor with #2 Ultrabraid™ suture, and the Stryker® 2.4 mm CinchLock® SS (Sports Sheath) anchor with #1 Zipline suture.

Figure 1: A foam block sample secured under the block fixture with the suture loop captured by the hook fixture.

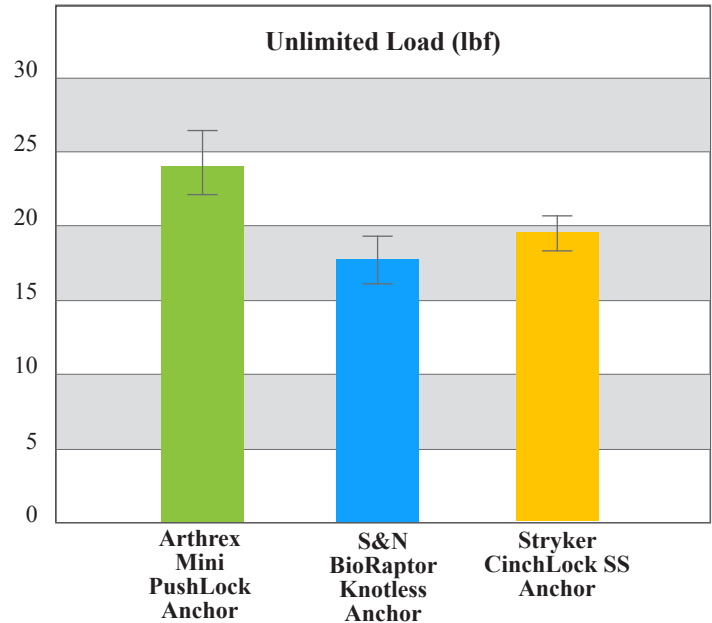


A pull to failure was performed at 12 in/min. Load and displacement data were recorded at 500Hz.

Methods and Materials

Forty (40) mm cubes of 30 pcf foam block were prepared with pilot holes created according to the surgical technique guides of each anchor type. All anchors were inserted with a loop of suture wrapped around a 1/2" metal dowel. Mechanical testing was performed using an Instron Materials Testing Machine (Model: 5544) with a 2kN load cell secured to the cross-head. A metal box fixture was attached to the testing surface, and a hook fixture was suspended beneath the load cell from a clevis and dowel. Samples were positioned such that the metal hook would apply a vertical load to the suture loop, in line with the foam block pilot holes, as shown in Figure 1.

Figure 2: The Arthrex Mini Hip PushLock anchor had the greatest ultimate load of the 3 anchors.



Results

The maximum loads for each of the 3 anchor groups were as follows: Arthrex 2.4 mm Mini Hip PushLock anchor **24.1 ± 2.0 lbf**, Smith & Nephew 2.9 mm BioRaptor knotless anchor **17.6 ± 1.5 lbf**, and the Stryker 2.4 mm CinchLock SS anchor **19.7 ± 0.9 lbf**. These results are displayed in Figure 2. The Arthrex 2.4 mm Mini Hip PushLock anchor had a significantly greater ultimate load when compared to the other 2 anchors ($p < 0.001$ for each comparison).

Conclusions

The Arthrex 2.4 mm Mini Hip PushLock anchor has a significantly greater pullout strength than both the Smith & Nephew 2.9 mm BioRaptor knotless anchor and the 2.4 mm Stryker CinchLock SS (Sports Sheath) anchor.