Pull-out Strength of Various Knotless Hip Suture Anchors
Arthrex Research and Development

Test Objective

Determine and compare the pull-out 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.

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 ½” 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.

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).

Conclusion

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