

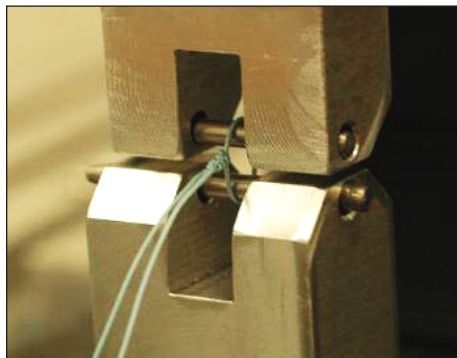
FiberWire® Suture vs OrthoCord® Suture Knot Security and Ultimate Tensile Load Study

Arthrex Research and Development

Objective

The purpose of this study was to compare knot security, straight pull and knot pull of #2 FiberWire suture and #2 OrthoCord® suture.

Figure 1. Knot Security Test Set-up



Methods and Materials

Each suture was tied around a 30 mm circumference plastic post to assure a consistent loop size. The Surgeon's, Roeder and Weston knots included a series of 3 reversing half-hitches on alternating posts (RHAPs). Each loop was then mounted on an INSTRON[†] materials testing system (model #5544, Instron, Canton, MA) to test the knot security of each type of knot (Figure 1). Knot security is the load at 3 mm of extension of the loop. The 3 mm of extension was chosen because loop elongation of 3 mm or more is generally accepted as clinical failure.

For straight pull, each suture was clamped at a gauge length of 5 inches in the pneumatic grips. The same procedure was followed for knot pull, except a Surgeon's knot (no RHAP) was tied around a silicone tube located in the middle of the suture gauge length.

Results

Tying a Surgeon's knot or a sliding knot with #2 FiberWire suture significantly increases knot security in comparison to the same knots tied with #2 OrthoCord suture (Figure 2).

#2 FiberWire suture has straight pull load of 320 ± 24 N and knot pull load of 156 ± 12 N. #2 OrthoCord suture has a straight pull load of 212 ± 8 N and a knot pull load of 124 ± 11 N (Figure 3). The straight pull and knot pull load of #2 FiberWire suture as compared to #2 OrthoCord suture is statistically significant.

Figure 2: Knot Security Test Results

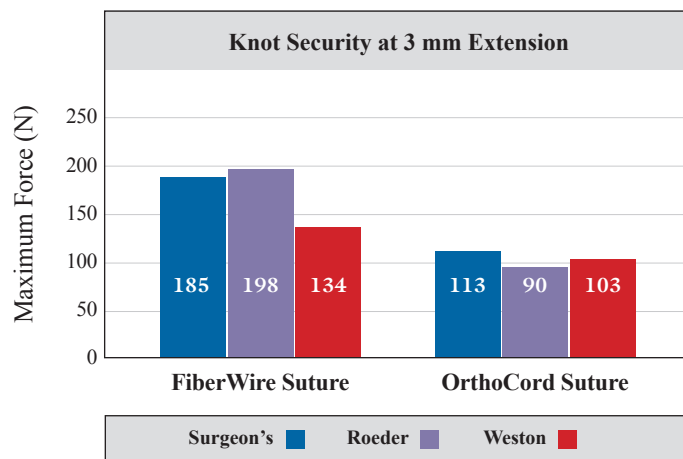
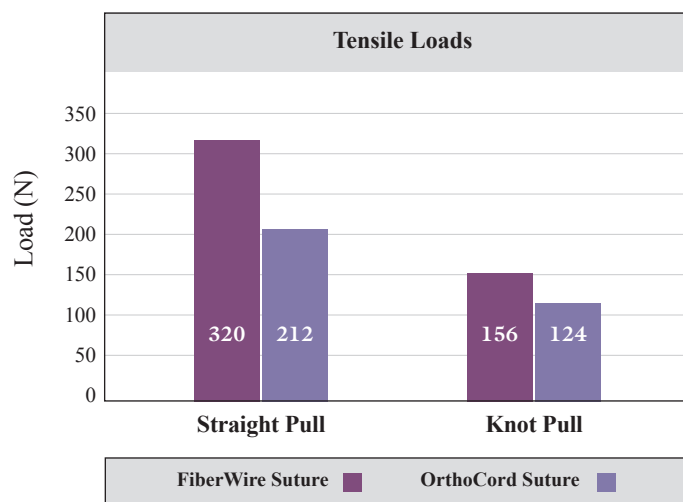


Figure 3: Straight and Knot Pull Results



Conclusion

After evaluating the 2 sutures, #2 FiberWire suture outperforms #2 OrthoCord suture in knot security, straight pull and knot pull.

*OrthoCord is a trademark of DePuy Synthes.

†Instron is a trademark of Illinois Tool Works Inc.