

FiberWire vs OrthoCord

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 and #2 OrthoCord (DePuy Mitek).

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 three 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 significantly increases knot security in comparison to the same knots tied with #2 OrthoCord suture (Figure 2).

#2 FiberWire has straight pull load of 320 ± 24 N and knot pull load of 156 ± 12 N. #2 OrthoCord 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 as compared to #2 OrthoCord is statistically significant.

Figure 2. Knot Security Test Results

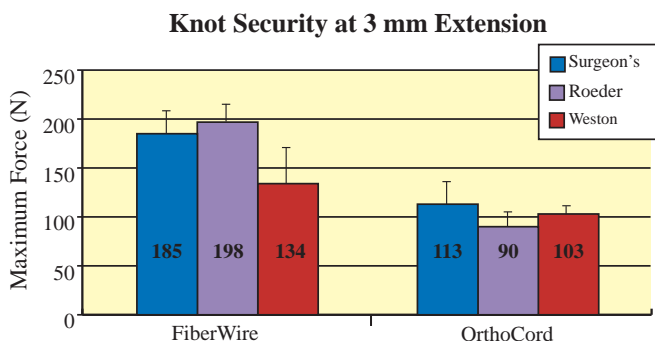
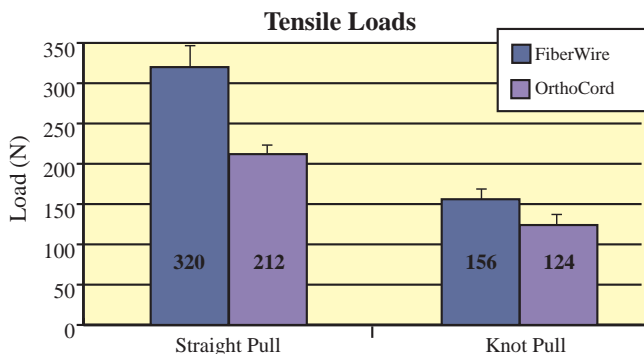


Figure 3. Straight and Knot Pull Results



Conclusion

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