

SUMMARY OF PEER-REVIEWED LITERATURE

Abrasive Properties of Braided Polyblend Sutures in Cuff Tendon Repair: An in Vitro Biomechanical Study Exploring Regular and Tape Sutures

Deranlot J, Maurel N, Diop A, Nourissat G, et al. *Arthroscopy* 2014 Aug 20 [Epub].

Purpose

This study aimed to evaluate the abrasive properties (mean cutting rate and defect size) of different high-strength suture materials through tendon. Both regular and tape configurations were tested.

Methods

Four types of sutures were compared: #2 Hi-Fi® (ConMed), #2 Orthocord (DePuy Mitek), #2 FiberWire (Arthrex), and 2mm #2 FiberTape (Arthrex). Each suture (n = 10) was cycled with a 10 N fixed tensile load through sheep infraspinatus tendon (Fig 1). The migration of the suture was measured as it cut through tissue.

Results

Hi-Fi and Orthocord showed a significantly ($P < .01$) lower amount of abrasion (mean cutting rate and defect size after 15 cycles) compared with FiberWire and FiberTape. The mean cutting rate (Graph 1) was 0.12 mm/cycle (Hi-Fi), 0.11 mm/cycle (Orthocord), 0.25 mm/cycle (FiberTape), and 0.32 mm/cycle (FiberWire). The defect size after 15 cycles (Graph 2) was 5.7mm (Hi-Fi), 5.6mm (Orthocord), 7.4mm (FiberTape), and 9.4mm (FiberWire).

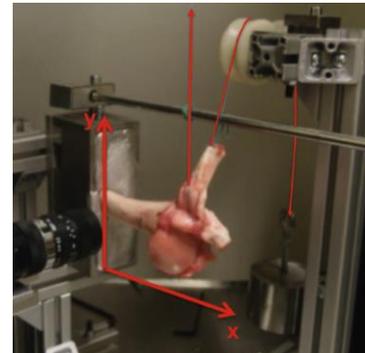
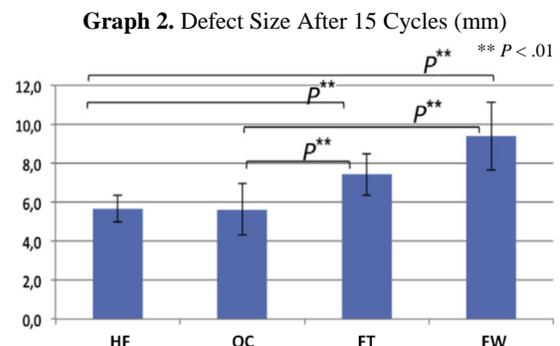
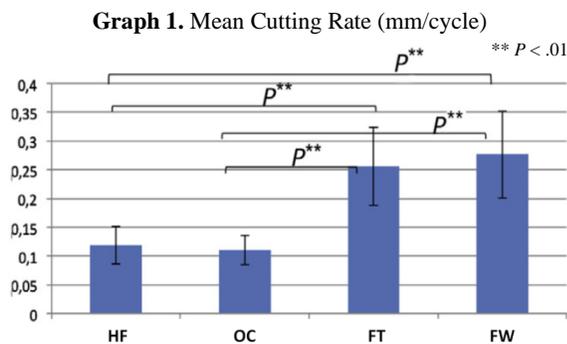


Fig 1. The distal humerus was embedded on a fixation device (x = diaphyseal humeral axis; y = longitudinal axis of the tendon).



Discussion

The suture-tendon interface represents a critical component of repair security in rotator cuff repair¹. As ultra-high-molecular-weight polyethylene (UHMWPE) sutures have become popular in orthopedics, the repair failure has transitioned from suture breakage in polyester sutures to suture cutting through tendon in high-strength sutures². Therefore a suture should be chosen that minimizes the abrasive properties on the suture-tendon interface.

Conclusions

Hi-Fi and Orthocord had over 50% reduction in mean cutting rate compared to FiberWire and FiberTape, which were more abrasive on the suture-tendon interface and led to higher tendon tear-through. This study does not support the hypothesis that increasing the width of the suture decreases its abrasive properties.

References

1. Kowalsky MS, et al. *Arthroscopy* 2008.
2. Bisson LJ, et al. *Am J Sports Med* 2008.

NOTE: This study uses ForceFiber™, a Teleflex product supplied to the author by Tornier. ForceFiber and Hi-Fi® are the same product from Teleflex.