

# Evaluation of FiberWire® Suture in a Canine Meniscal Repair Model

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## Background

Meniscal repair is currently performed using various suture materials placed using all-inside, inside-out, or outside-in techniques. FiberWire suture is constructed of a multistrand, long-chain ultra-high-molecular weight polyethylene (UHMWPE) core with a braided jacket of polyester and UHMWPE that gives FiberWire suture its superior strength, soft feel, and abrasion resistance.<sup>1</sup>

## Purpose

The purpose of this study was to assess the effects of FiberWire suture in a canine model with respect to maintaining suture integrity and opposing articular cartilage damage during the 3 months following implantation, while allowing full activity.

## Study Design

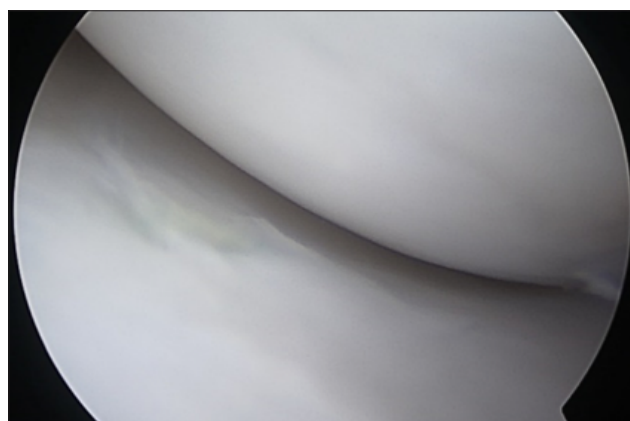
Translational animal study.

## Methods

Three adult purpose-bred hounds underwent aseptic surgery for arthroscopy-assisted meniscal suturing in both knees (n=6) of each canine, alternating between lateral and medial meniscus for each knee. One 2-0 FiberWire suture was placed in the red-white zone of the load-bearing portion of the anterior horn of the meniscus using a zone-specific cannula in an inside-out technique. Knees were assessed clinically based on maintenance of joint function, and at 3 months post-implantation using arthroscopic, gross, and histology evaluations to determine maintenance of suture integrity and evidence of opposing articular cartilage damage. Histologic scoring of the tissues was performed by two board-certified veterinary

pathologists, blinded to treatments, using the OARSI histologic scoring system for canine OA for synovia and osteochondral tissue.<sup>2</sup> Based on this, a total cartilage pathology severity score for the tibial plateau and the femoral condyle was determined for each of the canines.

**Figure 1.** Representative arthroscopic images of the medial compartment synovium of the canine knee 3 months after meniscal suturing using FiberWire suture.



## Results

All canines maintained normal clinical function after recovery with no complications or impairments noted. Knee range of motion was within normal limits in all canines at the end of the study period. Arthroscopic assessments at 3 months postimplantation documented maintenance of suture integrity (Figure 1). Histologic assessments at 3 months post-surgery documented minimal to no opposing articular damage associated with meniscal tears repaired using FiberWire® meniscal sutures (Table 1). The mean and range of histopathology severity scores are within reference ranges for sham-treated control joints and below those associated with untreated meniscal tears.<sup>3,4</sup>

## Conclusion

FiberWire sutures can be effectively placed in the anterior horn of the canine meniscus. FiberWire sutures maintained integrity without causing significant opposing articular cartilage damage over 3 months following implantation in this preclinical model.

## References

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3. Cook JL, Smith PA, Bozynski CC, et al. Multiple injections of leukoreduced platelet rich plasma reduce pain and functional impairment in a canine model of ACL and meniscal deficiency. *J Orthop Res*. 2016;34(4):607-615. doi:10.1002/jor.23054.
4. Kuroki K, Cook CR, Cook JL. Subchondral bone changes in three different canine models of osteoarthritis. *Osteoarthritis Cartilage*. 2011;19(9):1142-1149. doi:10.1016/j.joca.2011.06.007.

Table 1. Histologic assessment of articular cartilage alterations of the tibial plateau and the femoral condyle 3 months postimplantation using the OARSI histologic scoring system for canine OA. The mean and range of histopathology severity scores are within reference ranges for sham-treated control joints and below those associated with untreated meniscal tears.

Articular Cartilage Grading Scale (0-180) <sup>2</sup>		
Subject #	Tibial Plateau	Femoral Condyle
Subject 1	17	19
Subject 2	15	13
Subject 3	11	10

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use. Postoperative management is patient specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.