

Histological Analysis of the 2.4 mm BioComposite SutureTak and JuggerKnot Suture Anchor

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Objective

The objective of this study was to evaluate and compare the histologic responses of a “solid” bioabsorbable suture anchor (2.4 mm BioComposite SutureTak, Arthrex) and an “all-suture” anchor (JuggerKnot, Biomet) placed in the glenoid rim of dogs.

Methods and Materials

Adult (2-4 years) purpose-bred research dogs (n=6) weighing greater than 20 kg were used for this study with IACUC approval. Using a mini lateral approach, anchors were inserted into the rim of the glenoid using manufacturer’s instructions and instrumentation. One anchor of each type (n=6/anchor) was placed in the glenoid of each dog in either an anterior or posterior location, with the site altered so that each anchor was equally distributed between locations. The suture from each anchor was passed through adjacent labrum and capsule in a simple stitch configuration and tied; however, no tear or defect was created in labral or capsular tissue. The dogs were allowed full ambulation in their runs for the duration of the study. The dogs were euthanized eight weeks after implantation and the glenoids were collected and processed for nondecalcified sectioning to include the long axis of each anchor and staining using Goldner’s trichrome (mineralized bone = green, osteoid and connective tissue = red-brown). One pathologist (KK) who was blinded to anchor type and location assessed the histologic sections with respect to bone socket size and morphometry, anchor presence and integration, and responses of surrounding bone. Anchor socket size data were compared for statistically significant ($p < 0.05$) differences using a t-Test.

Results

All JuggerKnot anchor sites were cyst-like cavities with a thin rim of cortical bone (Fig. 1). The cavities were filled with suture and fibrous tissue. All SutureTak anchor sites contained intact anchors with close approximation of trabecular bone with the entire threaded portion of the anchors (Fig. 2). No histologic evidence for overt necrosis or inflammatory or foreign body responses in association with the SutureTak anchors was noted. At eight weeks after implantation, mean

socket width of the JuggerKnot anchor sites was 6.3 ± 2.5 mm (drill bit diameter = 1.4 mm), which was significantly ($p = 0.013$) larger than the mean socket width of 2.7 ± 0.7 mm measured for the BioComposite SutureTak anchor sites (original drill bit diameter = 1.8 mm).

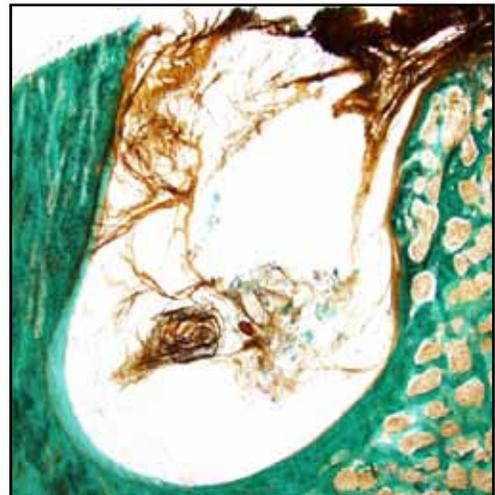
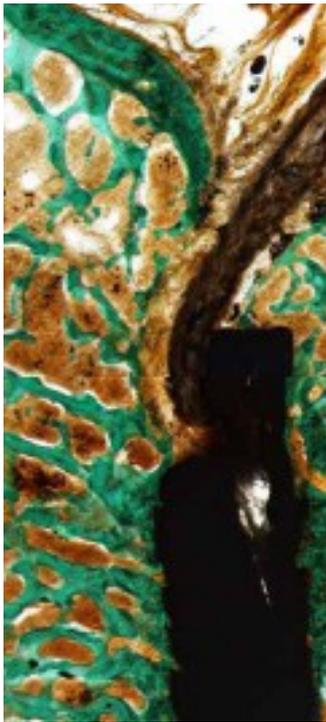


Figure 1: Representative images of JuggerKnot Anchor sites



Discussion

This data suggests that 2.4 mm BioComposite SutureTak anchors have superior bone integration characteristics and maintenance of socket diameter compared to JuggerKnot anchors, when placed in the glenoid rim in a canine model.



Figure 2: Representative images of BioComposite SutureTak anchor sites