

# 8 mm × 20 mm FastThread™ BioComposite Interference Screw in ACL Reconstruction Using Bone-Tendon-Bone (BTB) Grafts

Arthrex Research and Development

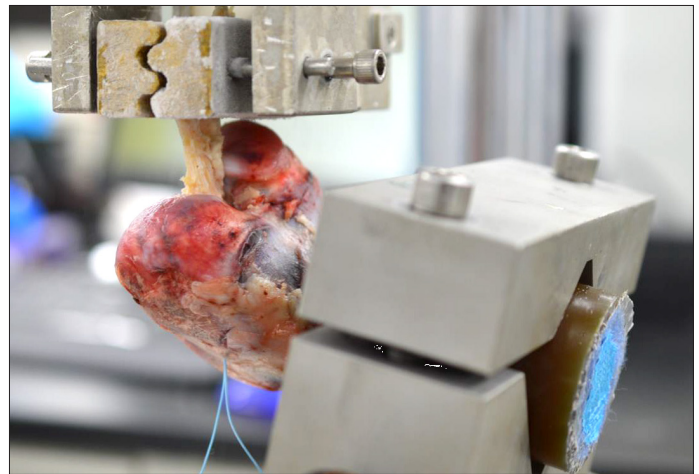
## Objective

The objective of this study was to investigate the biomechanical properties or strength of ACL reconstruction using BTB grafts in a porcine femur model using 8 mm × 20 mm FastThread BioComposite interference screws for BTB graft fixation. In addition, biomechanical properties of the subject screw were directly compared to biomechanical properties of 8 mm × 23 mm biocomposite interference screws (Arthrex, Inc.) and 8 mm × 20 mm Biosure™ Regenesorb™ screws (Smith & Nephew, Inc.).

## Methods and Materials

Eight (8) porcine femurs were potted in fiberglass. BTB grafts were created from human donor samples (Joint Restoration Foundation). Each graft was sized to a 10 mm × 25 mm bone block, and a 2 mm drill hole was created through the bone block for #2 FiberWire® suture. The bone tunnel was drilled with a 10 mm reamer to create a 25 mm- to 30 mm-deep socket at the ACL footprint and the graft was pulled into the socket with the FiberWire® suture. A bone was tapped and a screw was inserted until it flushed with the bone. A pull-to-failure test was performed using an Instron E10000 mechanical testing system. The soft tissue portion of the graft was briefly held in a custom-made freeze clamp connected to the actuator and the potted femoral portion was held in a fixture secured to system's base (Figure 1). A pull-to-failure test was conducted at a rate of 20 mm/min.

**Figure 1.** Shows Test Setup



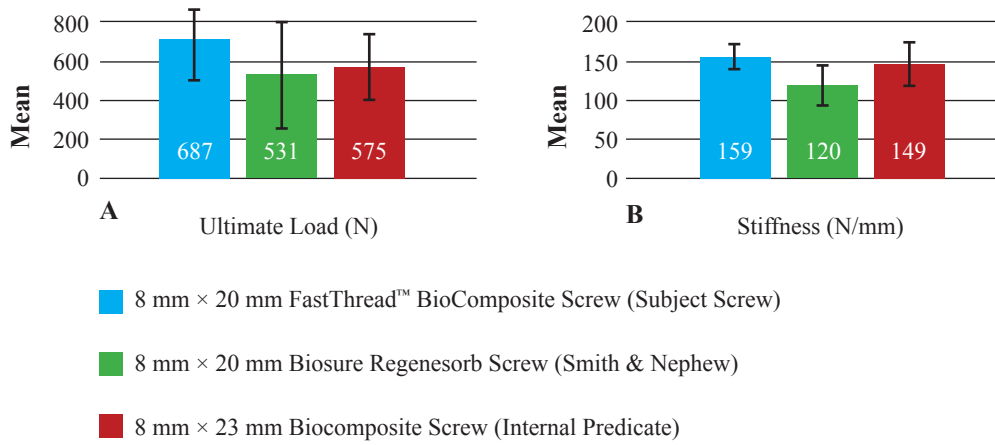
## Results

Table 1 shows ACL reconstruction biomechanical properties for the subject screw as well as a direct comparison of the same with the 8 mm × 23 mm biocomposite screw and the 8 mm × 20 mm Biosure Regenesorb screw.

**Table 1.** Shows ACL reconstruction mechanical properties for subject screw and direct comparison of the same with Smith & Nephew and internal predicate screws.

Parameters	8 mm × 20 mm FastThread BioComposite Screw (Subject Screw) Mean ± SD	8 mm × 20 mm Biosure Regenesorb Screw (Smith & Nephew) Mean ± SD	8 mm × 23 mm Biocomposite Screw (Internal Predicate) Mean ± SD
<i>Ultimate Load (N)</i>	687 ± 182	531 ± 269	575 ± 163
<i>Stiffness (N/mm)</i>	159 ± 37	120 ± 53	149 ± 64

**Figure 2.** Graphical representation of data presented in Table 1



### Conclusion

The direct comparison revealed that the 8 mm x 20 mm FastThread BioComposite interference screw performed better than the 8 mm x 20 mm Biosure Regenesorb screw and the 8 mm x 23 mm biocomposite interference screw (Table 1).