

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

Arthrex Orthopedic Research

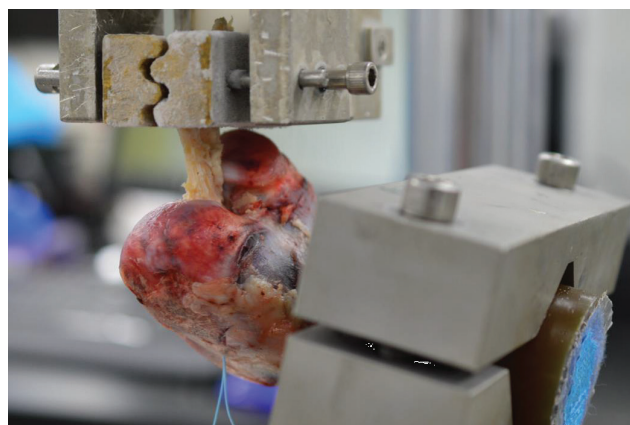
## Objective

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 BioComposite FastThread 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 (Instron, MA). 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.** Femur oriented so that graft was pulled in-line with screw insertion trajectory.



## Results

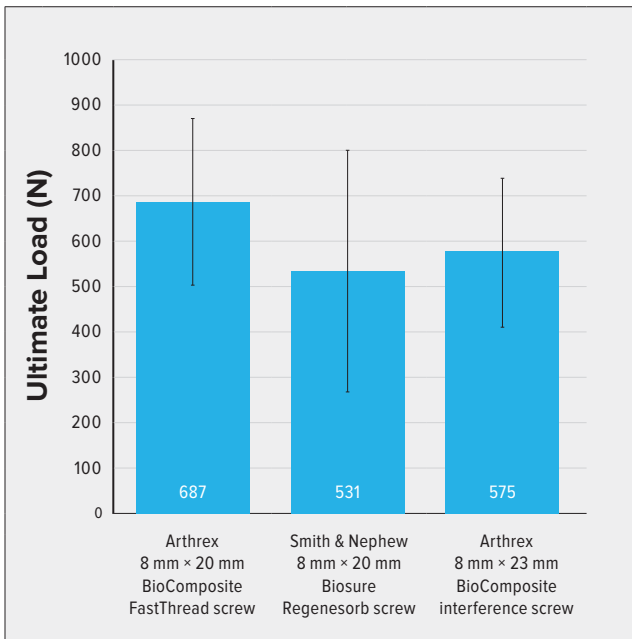
Table 1 shows ACL reconstruction biomechanical properties for the subject screw as well as a direct comparison of the same with the 8 mm × 23 mm BioComposite interference screw and the 8 mm × 20 mm Biosure Regenesorb screw. The ultimate load (N) of the three screw groups tested is shown in Figure 2. Their stiffness (N/mm) is shown in Figure 3.

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

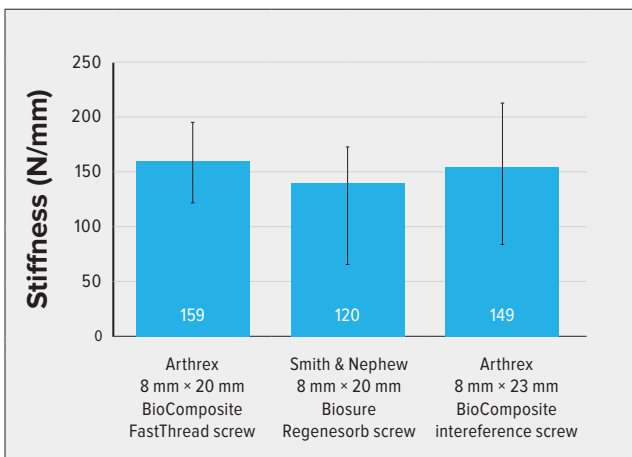
Parameters	8 mm × 20 mm BioComposite FastThread screw (subject screw) mean ± SD	8 mm × 23 mm Biocomposite interference screw (internal predicate) mean ± SD	8 mm × 20 mm Biosure Regenesorb screw (Smith & Nephew) mean ± SD
Ultimate Load (N)	687 ± 182	575 ± 163	531 ± 269
Stiffness (N/mm)	159 ± 37	149 ± 64	120 ± 53



**Figure 2.** Graphical representation of ultimate load values



**Figure 3.** Graphical representation of axial stiffness values



## Results

Though no significant findings were found ( $P > .05$ ) a direct comparison revealed that the 8 mm x 20 mm BioComposite FastThread interference screw had higher ultimate load values than the 8 mm x 20 mm Biosure Regenesorb screw and the 8 mm x 23 mm BioComposite interference screw (Table 1).<sup>1</sup>

### Reference

1. Arthrex, Inc. Data on file (APT-03583). Naples, FL; 2018.