

# BioComposite SutureTak, BioComposite Corkscrew FT and BioComposite PushLock: An *In Vitro* Degradation Study

Arthrex Research and Development

## Objective

Sixteen week *in vitro* degradation studies were performed comparing ultimate pull-out strength of the Arthrex 3.0 mm BioComposite SutureTak (85% PLDLA/ 15%  $\beta$ TCP), the 5.5 mm BioComposite Corkscrew FT (85% PLLA/ 15%  $\beta$ TCP), and the Arthrex 3.5 mm BioComposite PushLock (85% PLLA/ 15%  $\beta$ TCP) to their respective 100% polylactic acid anchors.

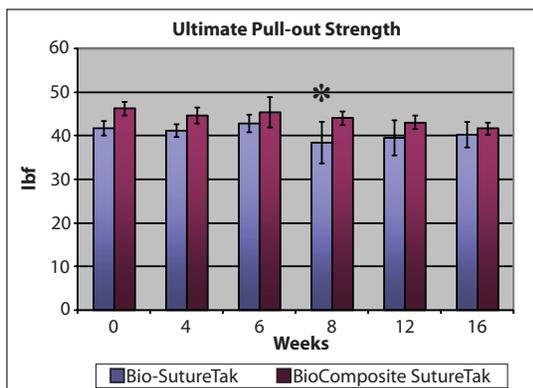
## Methods and Materials

Each BioComposite anchor was inserted into 20 lb/ft<sup>3</sup> polyurethane foam blocks and placed into glass containers. Containers were filled with 0.01M PBS, pH 7.4, and incubated at a temperature of 37°C. The PBS was checked weekly and changed if the pH fell out of the 7.2-7.6 range (per ASTM standard F1635-04). After specific time increments of soaking in PBS, the anchors were taken out of the incubator, lyophilized, and tested for ultimate pull-out strength on an Instron 5544 electromechanical materials testing system.

## Results

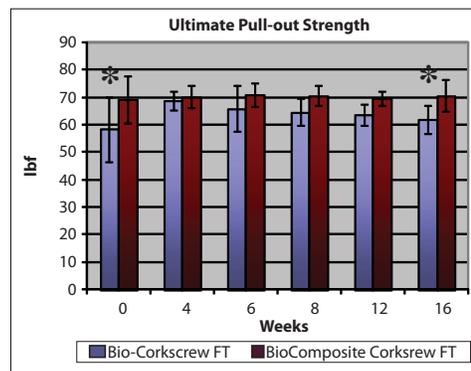
**BioComposite SutureTak:** When comparing individual time points, the maximum load of the BioComposites was not significant, except for week 8 where the higher maximum load of the BioComposite SutureTak was significant ( $p=0.017$ ), Figure 1. All anchors maintained adequate strength over 16 weeks.

**Figure 1:** Ultimate pull-out strength of the Bio-SutureTak and BioComposite SutureTak anchor over 16 weeks of degradation



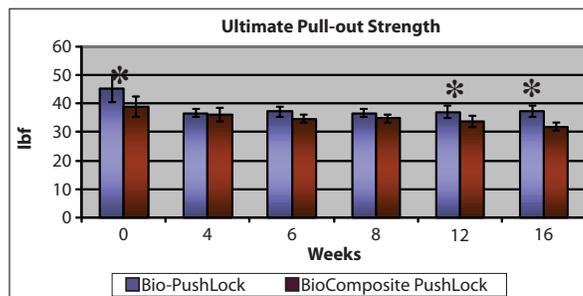
**BioComposite Corkscrew FT:** The higher peak load of the BioComposite Corkscrew FT was significant at weeks 0 and week 16,  $p=0.002$  and  $p=0.026$  respectively, Figure 2. Compared to each group's respective time zero, the Bio-Corkscrew FT and BioComposite Corkscrew did not lose mechanical strength over time. All anchors maintained adequate strength over 16 weeks.

**Figure 2:** Ultimate pull-out strength of the Bio-Corkscrew FT and BioComposite Corkscrew FT anchor over 16 weeks of degradation



**BioComposite PushLocks:** The lower peak load of the BioComposite PushLock was significant at weeks 0 ( $p<0.001$ ), 12 ( $p=0.031$ ), and 16 ( $p=0.001$ ) when comparing to the Bio-PushLock, Figure 3. All anchors maintained adequate strength over 16 weeks.

**Figure 3:** Ultimate pull-out strength of the Bio-PushLock and BioComposite PushLock anchor over 16 weeks of degradation



## Conclusion

All anchors tested in these studies maintained mechanical integrity over 16 weeks of *in vitro* degradation.