

Tensile and Cyclic Testing of Multiple Suture Anchors for Glenoid Labral Repair: A Biomechanical Study

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Objective

The objective of this test was to compare the biomechanical performance of several anchors used for glenoid labral repairs. The anchors tested were Arthrex 3.7 mm Bio-SutureTak, Arthrex 3 mm Bio-FASTak, Mitek Lupine, Smith & Nephew BioAnchor, and Smith & Nephew BioRaptor. All these require knots to complete the repair.

Methods and Materials

Seven matched pairs of glenoids were dissected of all soft tissue, and potted using fiberglass epoxy resin to facilitate fixation of the glenoid during testing. The anchors were inserted in the rim of each glenoid. To reduce the effect of variable bone quality around the glenoid, all anchors were inserted an equal number of times in the various glenoid positions. Each anchor was cyclically loaded between 10 and 60 N at 1 Hz for 500 cycles then pulled to failure at 33 mm/sec.

Results

The results of the testing can be seen in Figures 1 and 2. The cyclic displacement at 500 cycles of the Lupine anchor was significantly different from that of the Bio-SutureTak and Bio-FASTak ($p < 0.001$). The cyclic displacement at 500 cycles of the BioAnchor was significantly higher from that of the Bio-SutureTak and Bio-FASTak ($p < 0.001$). All other cyclic displacement comparisons between groups were not significantly different. No statistical difference existed between the ultimate load of any anchor ($p = 0.185$).

Figure 1.

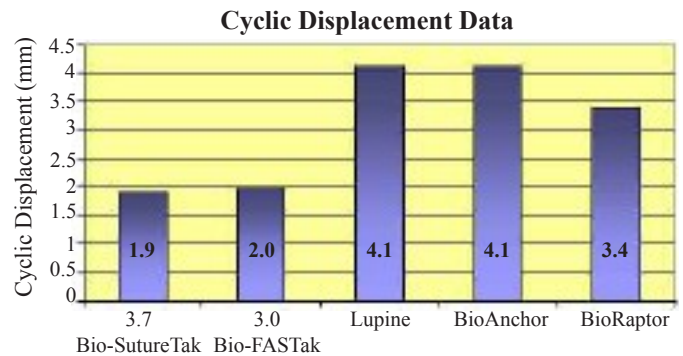
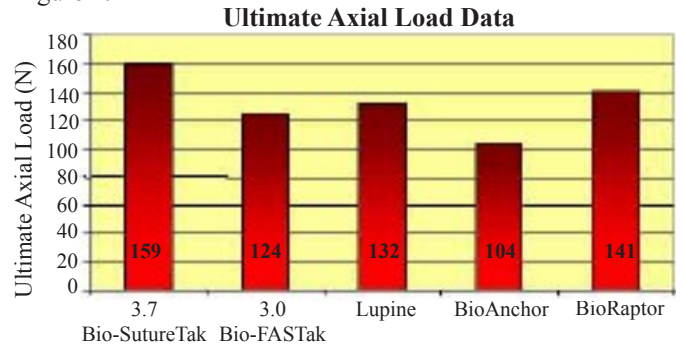


Figure 2.



Conclusion

The average cyclic displacement of the 3.7 mm Bio-SutureTak and the 3 mm Bio-FASTak is less than all knotted anchors that were tested. Clinically, this could lead to less gap formation and more successful outcomes.