

BIOMECHANICAL PULLOUT STRENGTH OF QUATTRO™ GL GLENOID LABRUM REPAIR ANCHORS

OBJECTIVE:

The purpose of this study is to evaluate the pullout strength of the Cayenne Quattro GL glenoid labrum repair anchor. We specifically used a testing protocol modeled after Barber et al.^{1,2} in order to allow comparison to published data. Using published historical data the pullout strength is placed within the context of other commercially available anchors.

CLINICAL BACKGROUND:

Contemporary arthroscopic glenoid labrum repair techniques typically utilize a suture anchor. These anchors will either be inserted in a knotless fashion, or placed with the surgeon employing knot tying. Regardless of the type of anchor selected, desirable characteristics include high initial pullout strength, low likelihood of suture pullout through the eyelet, and retention of strength through the tissue-healing period. Ease of postoperative imaging and ease of revision would also be useful.

METHODS & MATERIALS:

The parameters in this protocol were modeled after those found in Barber et al.^{1,2} This was done to facilitate comparisons of the Cayenne Medical shoulder anchor to other shoulder anchors tested using similar methods. The Cayenne Medical Inc. Quattro-GL implant is made of PEEK and is pre-loaded with one or two #2 high strength UHMWPE

non-absorbable sutures. The implant is offered in one size, 2.9mm.

Mature porcine femurs were obtained from pigs at least two years old and weighing approximately 450 pounds. Ten anchors were tested.

Materials:

- TCD-500 force tester and operator console (Chatillon P/N TCD500-0500E)
- E-DFE-500 2500N limit force gauge (Chatillon P/N E-DFE-500)
- Force gauge to test stand interface cable (Chatillon P/N NC000647)
- PC with NEXYGEN™ TCD Series software installed

Testing was performed at room temperature. Anchors were placed 1cm apart in alternating locations in the metaphyseal cortex. Using the testing apparatus the high strength suture was pulled in-line with the anchor insertion axis at a rate of 5mm per second, and load at failure was recorded.

RESULTS:

The Quattro GL Suture anchor has ultimate repair strength of $419 \pm 90\text{N}$ (Table 1).

Ultimate Repair Strength Pre-loaded Glenoid Labrum Anchors

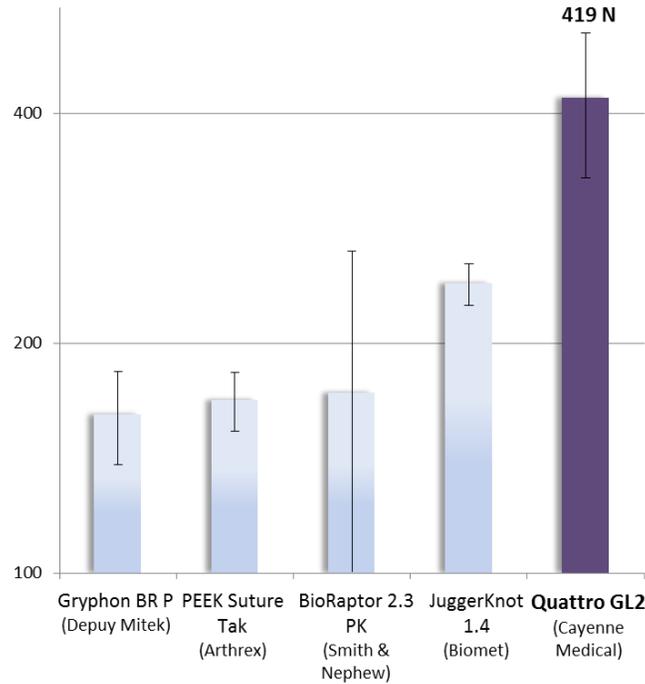


TABLE 1. *Glenoid anchor mean load to failure (N)*

CONCLUSIONS:

The Cayenne Medical Inc. Quattro GL suture anchor performed very favorably, satisfying desirable time-zero mechanical characteristics. Further direct comparative

testing will be performed. Note that comparative data is for reference only, and does not indicate that direct mechanical testing was performed in this test.

REFERENCES:

1. Barber FA, Herbert MA, Beavis RC, Barrera-Oro F. Suture anchor materials, eyelets, and designs: Update 2008. *Arthroscopy* 2008;24:859-867.
2. Barber FA, Herbert MA, Hapa O, Rapley JH, Barber CA, Bynum JA, Hrnack SA. Biomechanical analysis of pullout strengths of rotator cuff and glenoid anchors: 2011 update. *Arthroscopy*. 2011 Jul;27(7):895-905.