

# VERSALOK® PEEK Anchor with ORTHOCORD® Suture

## Lateral Row Cadaveric Pull Strength

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### Introduction

The VERSALOK PEEK anchor is the second anchor in the VERSALOK family. Similar to VERSALOK, the new VERSALOK PEEK anchor uses the same insertion and deployment method and achieves subcortical fixation through radial expansion. A proximal crown of six teeth and mid-body wings featured on the VERSALOK PEEK anchor provide optimal cortical and cancellous bone purchase.

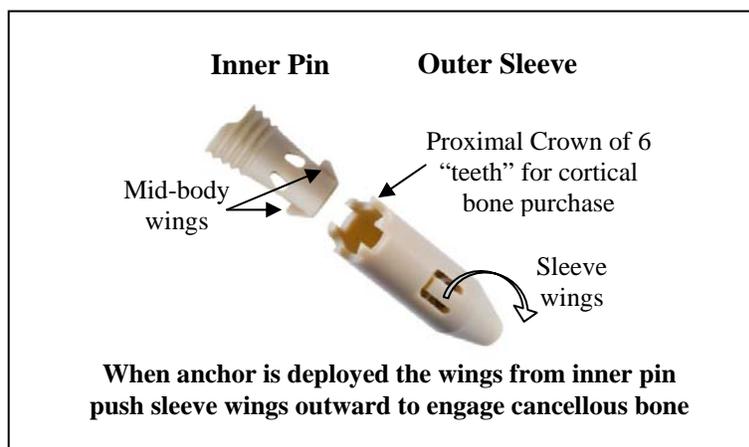


Figure 1: VERSALOK PEEK anchor mid-body wings and proximal crown

### Objective

To compare the pull strength of the VERSALOK PEEK anchor to two competitive anchors, the Arthrex SwiveLock\* 4.75mm (PEEK, vented) and Arthrex PushLock\* 4.5mm (PEEK), in lateral row cadaveric testing with suture pulled in an anatomic direction. Both the mode of failure and the force required for failure will be observed and recorded.

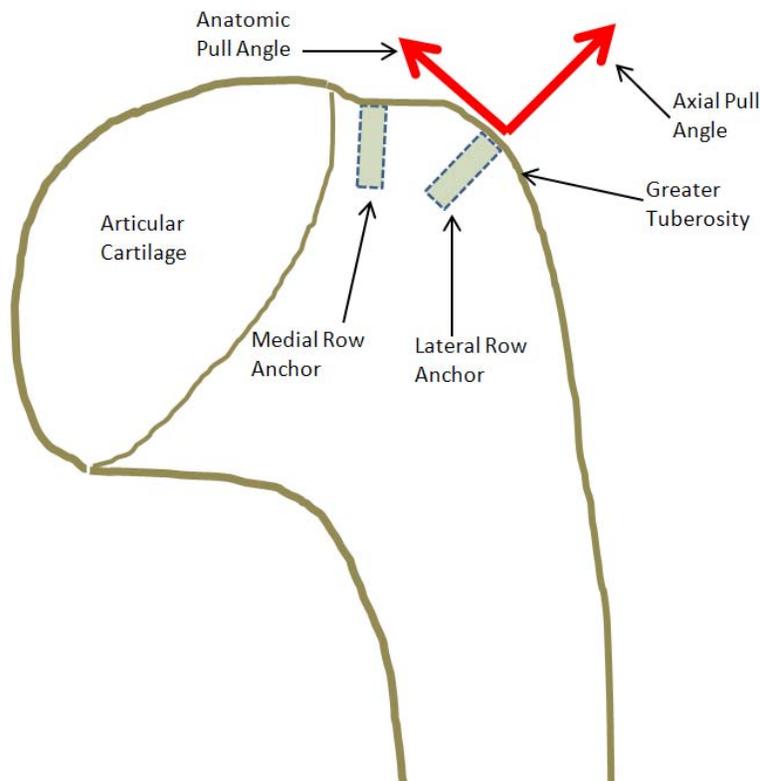
### Materials and Methods

Fourteen human cadaveric humeri were cleaned of skin, fat, muscle, tendon, and other tissue, leaving the bare humerus for anchor insertion and pull testing. Anchors were placed in the greater tuberosity, where a typical lateral row anchor would be inserted during a rotator cuff repair procedure. The anchors tested were the VERSALOK PEEK anchor with #2 ORTHOCORD suture, Arthrex SwiveLock 4.75 (PEEK, vented) with #2 FiberWire\* suture, and Arthrex PushLock 4.5 (PEEK) with #2 FiberWire suture. All anchors were loaded with the two ends of a single length of suture, leaving a loop of suture (approximately 2 inches long) to be pulled by the MTS mechanical tester.

The humerus was mounted on the benchtop for anchor insertion and then moved to a multi-axis fixture so the sutures could be pulled in an anatomic direction, roughly tangent to the surface of the bone in a superior direction (see Figure 2). The loop of suture was

pulled at 10 in/min until the first failure mode was observed, then the pull was paused. If a suture slide was observed to be the first failure mode, a forced anchor pullout test was conducted by tying the free tails of suture into a large knot and pulling resumed until another failure mode occurred. Both the force to failure as well as the first and if available, the second failure mode were recorded.

*NOTE: Only the first failure mode would be observed in patients. The second pull test is not realistic for an anchor inserted into a patient and was observed for information purposes only.*



**Figure 2: Anatomic versus axial pull direction**

## Results<sup>1</sup>

The VERSALOK PEEK anchor had suture slide as the first observed failure mode in 14 of 15 tests (in very poor quality bone 1 anchor experienced pullout as its first observed failure mode). Suture slide occurred at  $26.1 \pm 3.0$  lbs (n=14), and the forced anchor pullout occurred at  $46.7 \pm 14.6$  lbs (n=15).

The Arthrex SwiveLock 4.75 (PEEK, vented) anchor had suture slide as the first observed failure mode in 8 of 9 tests (in average quality bone 1 anchor experienced pullout as its first observed failure mode). Suture slide occurred at  $15.5 \pm 6.5$  lbs (n=8), and the forced anchor pullout occurred at  $23.6 \pm 11.6$  lbs (n=9).

The Arthrex PushLock 4.5 (PEEK) anchor had suture slide as the first observed failure mode in 11 of 11 tests. Suture slide occurred at  $9.1 \pm 4.3$  lbs (n=11), and the forced anchor pullout occurred at  $28.3 \pm 15.4$  lbs (n=11).

See Figure 3 for a visual representation of the results.

*NOTE: Only the light blue bars in the graph are clinically-relevant failure modes of the anchors, the upper dark blue bars represent forced anchor pullouts.*

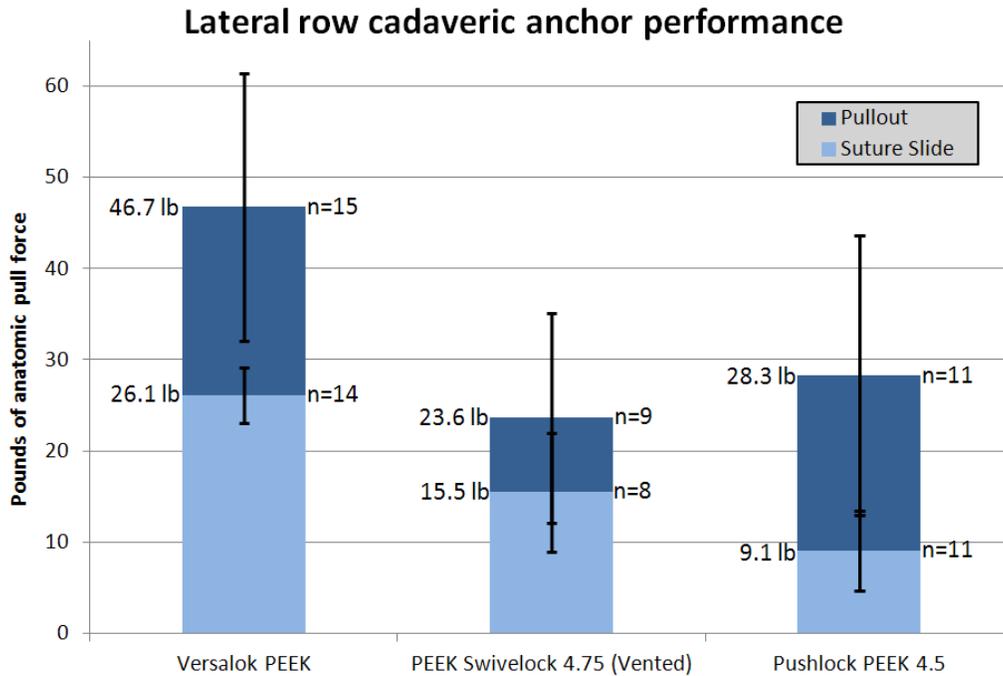


Figure 3: Lateral row cadaveric anchor performance

	<b>VERSALOK PEEK<sup>1</sup></b>	<b>PEEK SwiveLock<sup>1</sup></b>	<b>PEEK PushLock<sup>1</sup></b>
Suture Slide	<b>26.1 lbs</b>	15.5 lbs	9.1 lbs
Pullout	<b>46.7 lbs</b>	23.6 lbs	28.3 lbs

### Discussion and Conclusion

The first failure mode of all three anchors tested was primarily suture slide which would not result in loose bodies in the patient (as opposed to anchor pullout) and therefore is considered a safer and more favorable mode of failure.

The pull force value resulting in suture slide (the clinically relevant failure mode) for the VERSALOK PEEK anchor is 68% greater than Arthrex SwiveLock 4.75 (PEEK, vented) and 187% greater than Arthrex PushLock 4.5 (PEEK).

\* *PushLock, SwiveLock, and Fiberwire are registered trademarks of Arthrex, Inc., Naples, FL*  
 1 *Data on file at DePuy Mitek Inc, Raynham, MA 7/2010*