

Time Comparison of Whip Stitch with EasyWhip® and Loop Suture Needle

Objective

The purpose of testing was to compare the time required to complete a 5-throw whip stitch series with EasyWhip® versus a Loop Suture Needle. Stitching was completed by two fellowship-trained orthopedic surgeons on quadriceps tendons (QT) isolated from human cadaveric knee specimens.

Test Groups

Efficiency in stitching is a clinical need that has been well-established in literature.¹ Whip stitching with a conventional Loop Suture Needle (FiberLoop®, Arthrex) requires one end of the tendon to remain free so that the suture loop can be passed around the end of the tissue. Because of this, the tissue experiences a significant amount of motion during stitching, lengthening the time to stitch and affecting the user's ability to accurately place stitches.

Whip stitching with EasyWhip® provides an alternative where stitches can be placed while both ends of the tissue are securely clamped. This is enabled by the two-part needle design and results in less motion during stitching, allowing the user to work quickly and accurately. Efficient and accurate stitch placement allows for secure fixation, critical to successful outcomes.² Differences in stitch setup between EasyWhip® and a Loop Suture Needle are highlighted in Figure 1.

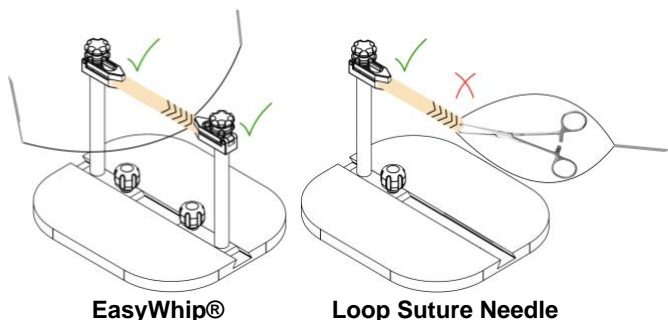


Figure 1: Illustration of stitch setup with EasyWhip® (left) and Loop Suture Needle (right) highlighting differences in stand clamps.

Methods

Quadriceps tendons were dissected from human cadaver specimens and standardized to the same size (70 x 12 x 8.5 mm). Tendons were divided into two groups of 8, for a total sample size of 16. Samples were affixed to a preparation stand. EasyWhip® group samples were secured on both ends with prep stand clamps. Loop Suture Needle samples had one end of the graft secured with a prep stand clamp and the other end was grasped with an Allis clamp, as depicted in Figure 1. Orthopedic surgeons placed five whip stitch throws at evenly spaced points 0.5 cm apart, as shown in Figure 2. Graft stitching times were recorded for each sample.

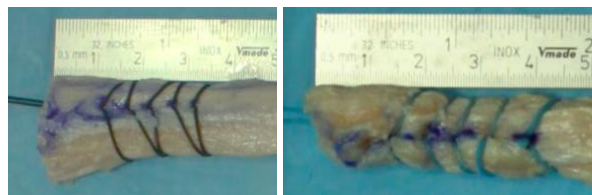


Figure 2: Example of tendon stitched with EasyWhip® (left) and Loop Suture Needle (right)

Results

Results are summarized in Table 1. Overall, the whip stitch took an average of 1 min 52 sec with EasyWhip®, whereas it took 2 min 54 seconds with the Loop Suture Needle (p=0.0045).

Table 1: Average timing result for five whip stitches created using an EasyWhip® and Loop Suture Needle.^{3,4}

Product	Average Stitching Time (min:sec)	Stdev (sec)
EasyWhip®	1:52	37
Loop Suture Needle	2:54	37
p-value	0.0045	

Whip stitching with EasyWhip® was 62 seconds (36%) faster than whip stitching with the Loop Suture Needle.

Discussion

EasyWhip® saved time during stitching because the tissue was securely clamped and was not moving around. Thus, the user could place stitches more efficiently, and with intention and accuracy, leading to secure fixation.

Timing testing was abbreviated to only the stitching sequence, so time savings in a clinical setting may be greater. Graft preparation typically requires 15-30 minutes during surgery and often includes multiple stitch series, so a 36% time savings would result in 5-10 minutes saved per surgery when EasyWhip® is used instead of a Loop Suture Needle. However, correlation to clinical results in humans is unknown at this time.

Conclusion

In bench testing, whip stitching with EasyWhip® is 36% faster than a conventional Loop Suture Needle.

References

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