Technical Note

A New Technique to Improve Tissue Grip:
“The Lasso-Loop Stitch”

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Abstract: In the chain of reattachment of the rotator cuff, links extend from the tendon to the anchor within the bone. Passage of the suture through the tendon is noted at the start of the chain, but as shown before, this is most vulnerable, depending on the quality of the tendon. We present a new technique of suture placement designed to improve tissue grip: “The lasso-loop stitch.” One side of the wire is passed through the edge of the tendon, which is ruptured by the wire in the middle—not at the end. The wire is not pulled through completely. Through this process, a loop is created at the upper side of the tendon. The end of the wire, at the same side used to make the loop, is passed through the loop with a grasp. The wire is passed through the loop, and the end of the wire is brought extra-articularly. Through this technique, the reduction force of a suture is augmented, and a constricting factor is added. We have not changed the location of the anchors. So far, we have used the technique in rotator cuff repair, biceps tenodesis, and the Bankart procedure. Key Words: Shoulder surgery—Arthroscopic repair—Surgical technique—Lasso loop stitch—Soft tissue fixation.

Many different factors contribute to the strength of a tendon repair. In the chain of reattachment of the rotator cuff, links extend from the tendon to the anchor within the bone. Passage of the suture through the tendon occurs at the start of the chain, but as shown before, this is most vulnerable, depending on the quality of the tendon.1,2 The modified Mason-Allen stitch, a massive cuff stitch, and the Mac-stitch have strengthened the tendon—suture interface, although arthroscopic results continue to be discussed.3-6

We present here a new technique that was designed to improve tissue grip; we developed this procedure through our extensive arthroscopic experience. The “lasso-loop stitch” can be used in the side-to-side suture, in distal reattachment of a tendon, and in biceps tenodesis. We even use this technique for Bankart repair.

The goal is to pass a loop through any tendon that is to be repaired and to pass a single free end through the loop for use as a lever arm mechanism. In this way, the force of traction on the tendon is almost 4 times the pulling force on the wire. At the same time, a constricting force is applied to the tissue that is to be fixed, providing improved tissue grip (Fig 1).

TECHNIQUE

The anchor is placed in the appropriate position. One side of the wire is passed through the edge of the ruptured tendon by taking the wire in the middle—not at the end. The wire is not pulled through completely. In this way, a loop is created at the upper side of the
tendon. The end of the wire, at the same side used to make the loop, is passed through the loop with a grasp. The wire is passed through the loop, and the end of the wire is brought extra-articularly. With the use of a grasp, the 2 ends of the wire are taken and brought outside through the same portal. With pulling on the end that does not pass the tendon, the stitch is placed close to the anchor. With pulling now at the other end that passes through the tendon, a lever arm is used to reduce the tendon. Because of this configuration, sliding knots cannot be used. Half-stitch locking knots are used to secure the suture. The end that does not pass through the tendon is used as the post (Fig 2).

APPLICATIONS

Side-to-Side Lasso-Loop Stitch

In the side-to-side situation, no anchor is used. A free wire is taken in the middle and is passed through both sides of the ruptured tissue. In this way, a loop is created at the second side. One free end of the wire is then passed through the loop. Both ends of the wire are brought extra-articularly to make the knot. With pulling alternately on both sides, the suture is tightened and the side-to-side suture closed (Fig 3).

Cuff Edge Lasso-Loop Stitch

For rotator cuff repair, this technique is used for the lateral suture in a double-row technique. When all anchors are in place and all wires have been passed through the tissue, the cuff is reduced with a locking knot made on the lasso-loop stitch at the lateral anchors. With this technique, greater reduction force is applied on the lateral stitches. After the reduction has been completed, mattress sutures on the medial anchors are tightened with the use of sliding knots.

Mattress Lasso-Loop Stitch

If thought useful, as we now think it is for Bankart repair, the other, free side of the wire is also passed through the tendon in the usual normal way. In this way, only 1 side of the wire passes through the tendon directly, and the other side passes through the tendon by means of the lasso-loop technique. Thus, the lasso technique may be used in combination with the mattress suture technique.
Biceps Tenodesis Lasso-Loop Stitch  
(Strangulation Principle)

In biceps tenodesis, the lasso-loop fixes the tendon directly to the bone. When 1 side is passed through the tendon with the lasso-loop technique, the suture is used for strangulation on the fibers of the tendon with double force. In this way, stronger fixation of soft tissue is provided.

CLINICAL EXPERIENCE

With use of this technique in biceps tenodesis, we have attained 27 excellent results in 30 consecutive cases. For rotator cuff and Bankart repair, the results appear promising, as seen in early clinical results, but follow-up is too short. We have not performed any imaging, although this is necessary if anatomic results are to be proved.

DISCUSSION

Arthroscopic repair of the rotator cuff is today’s golden standard in shoulder surgery. Fixation of the soft tissues, however, remains a big problem. We believe that the technique described here provides improved tissue grip and a stronger reduction force on the stitch. The “augmented force” principle and “the strangulation” principle contribute to improved soft tissue fixation. No extra material is needed, so no additional costs are incurred. However, this technique cannot be performed with the use of easily penetrating graspers. This technique will lead to improved results in arthroscopic and open procedures.

REFERENCES
