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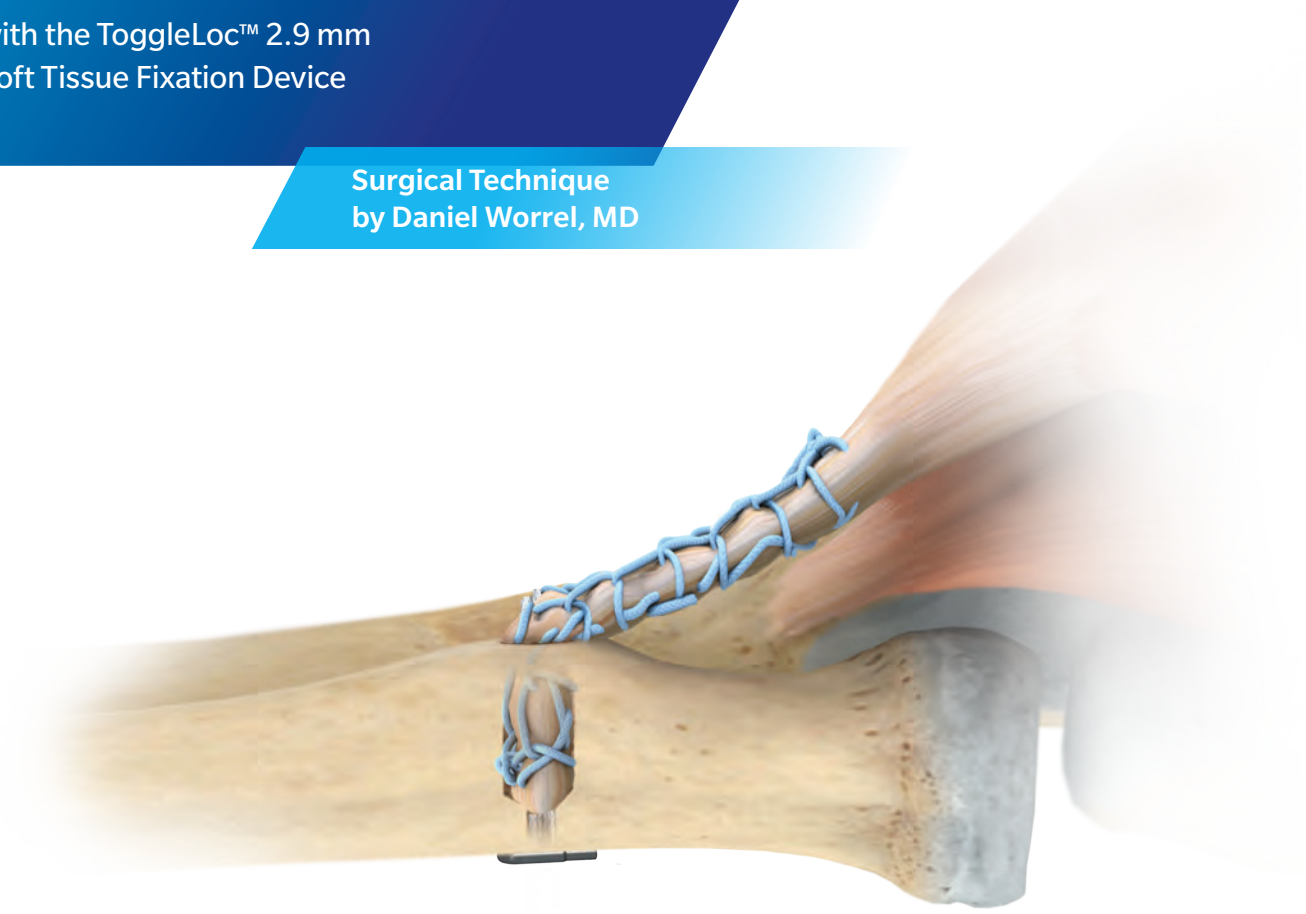
Distal Biceps Tendon Reattachment

with the ToggleLoc™ 2.9 mm
Soft Tissue Fixation Device

Surgical Technique
by Daniel Worrel, MD



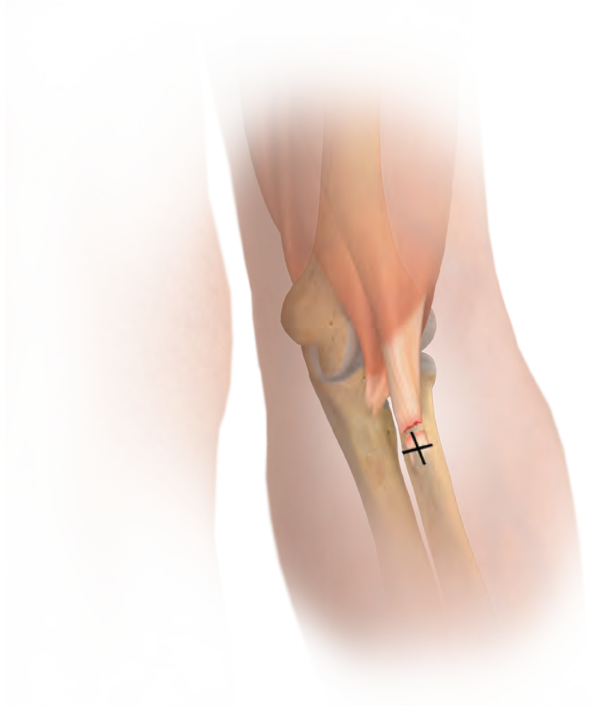


Figure 1

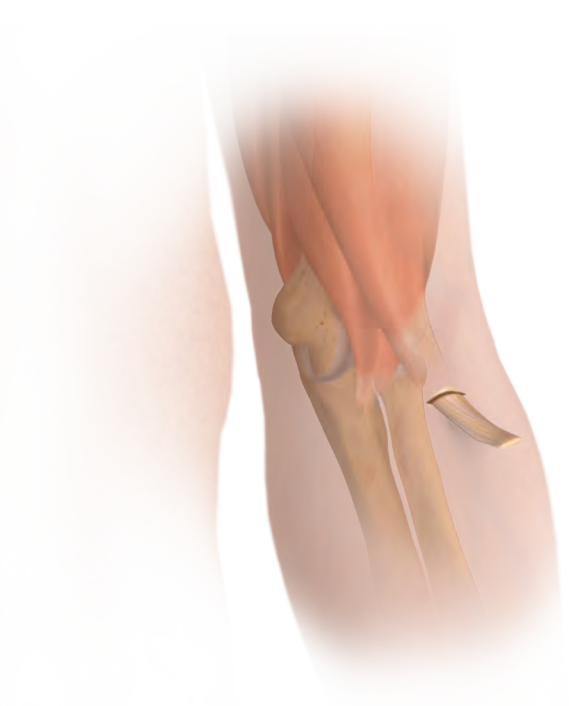


Figure 2

Incision

With the patient in the supine position and the arm extended on a radiolucent hand table, place the arm in supination to protect the posterior interosseous nerve and expose the bicipital tuberosity. During exposure, care should be taken to identify and protect the lateral antebrachial cutaneous nerve and not to traumatize the interosseous membrane.

For an acute rupture, use a 2.5 cm transverse incision 2 cm distal to the elbow flexion crease. This is directly overlying or immediately proximal to the bicipital tuberosity on the radius. Center this over the volar forearm to minimize retraction on the soft tissues (Figure 1).

After incising the skin, use electrocautery for hemostasis in the superficial tissues. Identify and protect the lateral antebrachial cutaneous nerve. Use scissors to spread the superficial fascia and open the biceps tendon sheath. While opening the sheath, note there may a frequent flush of serous fluid in acute ruptures. In order to retrieve the ruptured tendon without much difficulty, flex the elbow and insert a blunt retractor (Army Navy) (Figure 2).

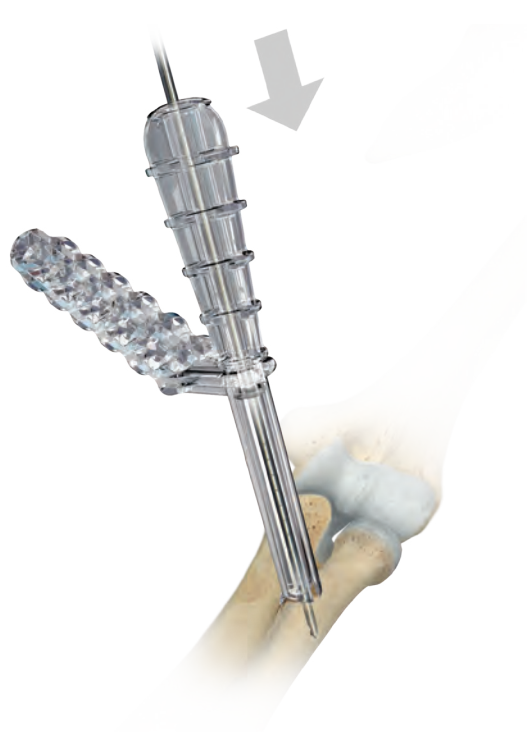


Figure 3

Figure 3a

Tendon Preparation

Identify the ruptured biceps tendon and sharply debride the macerated portions of the tendon. Place an Alice or Labey clamp on the end of the tendon to keep it from retracting.

Drill the 2.9 mm Tunnel

The normal anatomic path of the biceps tendon is generally easily palpated in an acute rupture. To palpate the bicipital tuberosity on the proximal radius, insert the index finger in the incision and gently supinate/pronate the forearm.

After exposing the bicipital tuberosity, place the ToggleLoc distal biceps guide/obturator over the bicipital tuberosity, utilizing the curved foot to help ensure that the guide remains in the proper location. Drill the 2.9 mm guide pin slightly distal and ulnar to minimize the risk of injury to the posterior interosseous nerve (Figure 3).

Note: It is critical that the pin is bicortical, but care should be taken to not plunge through the posterior cortex*. A pin driver is helpful as you can "choke up" to the laser line and eliminate plunging.

*The guide pin has etch lines calibrated at 5mm intervals (referenced off of the drill guide), that can be used to help identify the depth for the tunnel. Use fluoroscopic guidance to verify complete penetration of the opposite cortex (Figure 3a).

Figure 4

Figure 5

Ream the Socket

Keeping the guide pin and guide in place, remove the inner obturator and prepare to ream over the 2.9 mm guide pin with the desired reamer (Figure 4). If the pin is appropriately centered, the proximal cortex should be palpable. Use fluoroscopy to verify the position. Once verified, ream through the first cortex and advance the reamer into the canal. Carefully advance the reamer until contact is made with the far cortex. This depth is approximately 10-12 mm (Figure 5).

Note: Extreme care should be taken not to ream through the far cortex.

Note: While drilling the socket, the tip of the guide pin is clamped to maintain position and keep it from spinning in the soft tissues.

Figure 6

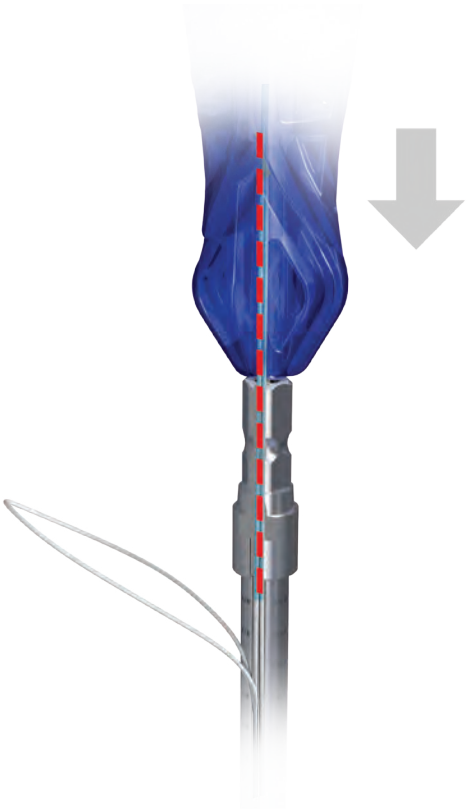


Figure 7

Insert the ToggleLoc 2.9 mm Implant

Detach the drill and remove the guide pin **leaving the slotted reamer in place** (Figure 6). Care should be taken to ensure that the reamer does not move as the guide pin is removed.

Note: It may be necessary to use the drill/pin driver to remove the guide pin.

Align the sutures of the implant with the slot in the reamer and insert the ToggleLoc 2.9 mm implant through the reamer until the handle bottoms out on the back of the reamer (Figure 7).

Figure 8

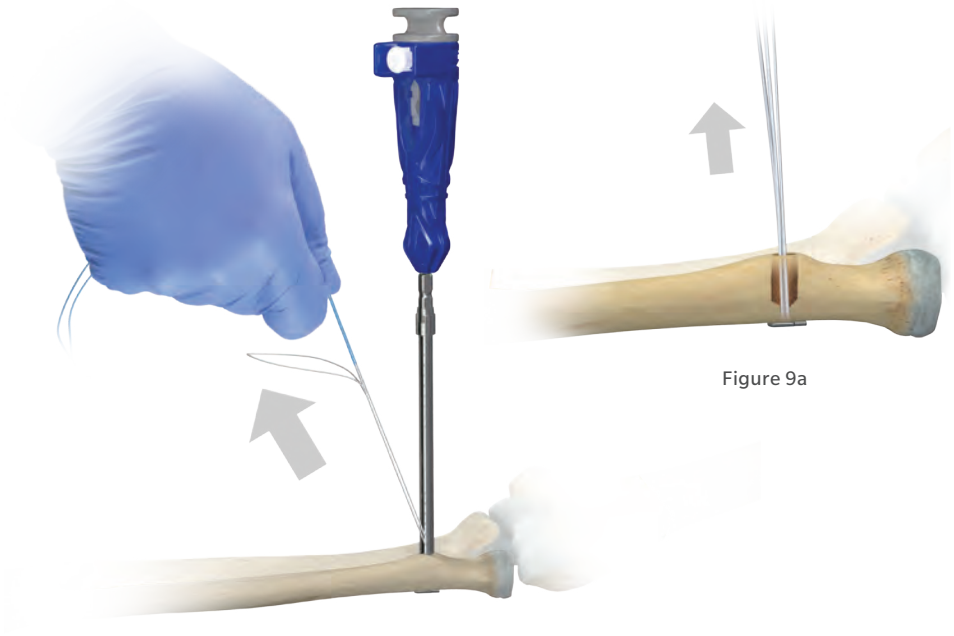


Figure 9

Figure 9a

Insert the ToggleLoc 2.9 mm Implant (cont.)

Remove the foam tab from the center of the handle and press the white safety button. Make sure that the handle remains bottomed out on the reamer and lightly mallet the top of the gray plunger until it bottoms out on the top of the inserter handle (Figure 8).

Deploy the Implant

With the inserter still in position, pull on the blue sutures to set the anchor (Figure 9). Once the anchor is set, remove the inserter and reamer (Figure 9a). The reamer may be removed by attaching the Zimmer – Hudson connection if needed, but **DO NOT SPIN THE DRILL.** Lay the implant suture strands to the side.

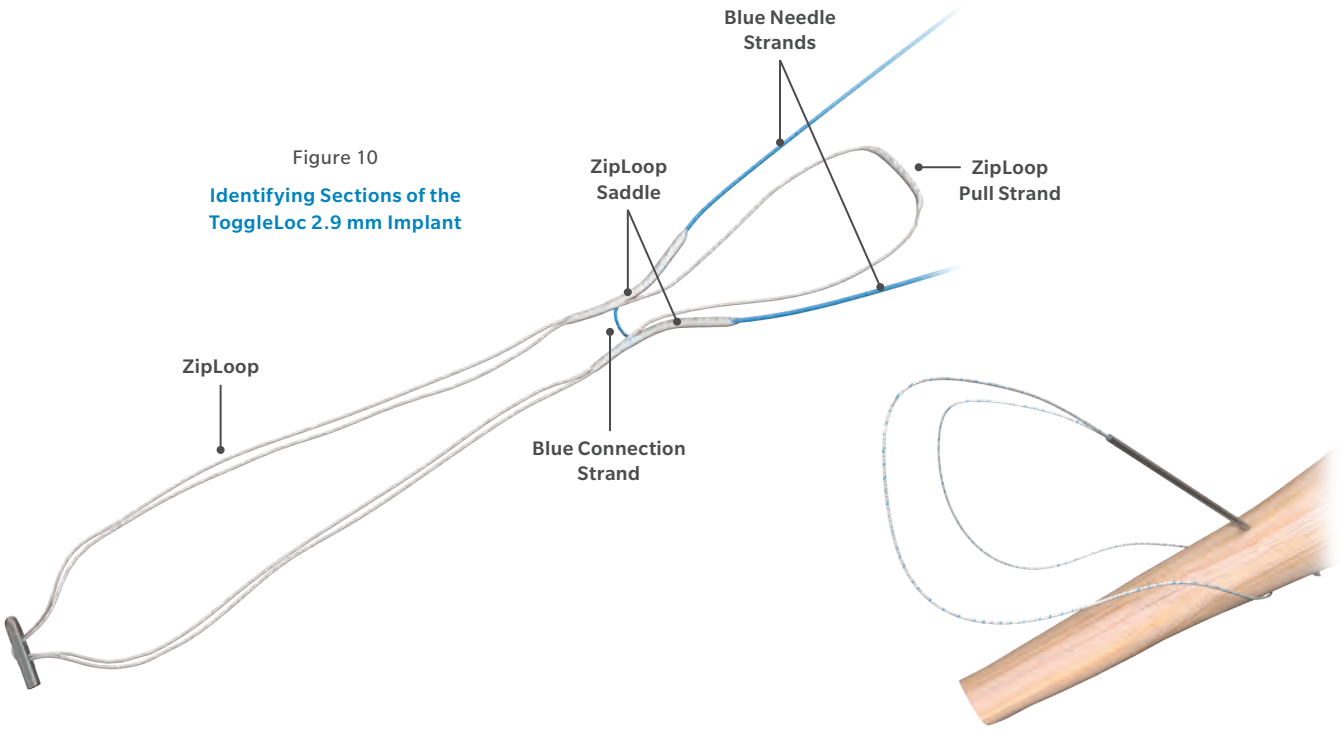


Figure 10

Identifying Sections of the ToggleLoc 2.9 mm Implant

Figure 10a

Attach Tendon to Implant

Utilize the ExpressBraid™ suture to whipstitch the tendon from the proximal to distal end. To begin, place the tendon through the loop of the ExpressBraid suture, and pierce the tendon with the needle such that it comes through proximal to the loop on the opposite side (Figure 10a).

Note: Make sure the white ZipLoop™ pull strand remains separate from the blue needle strands being used to prepare the tendon.

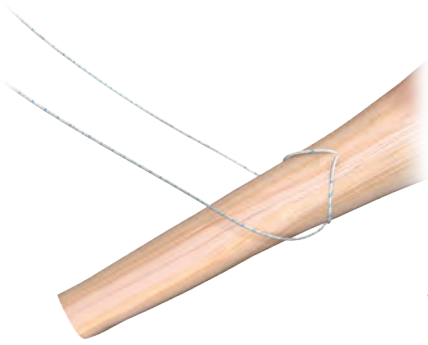


Figure 10b

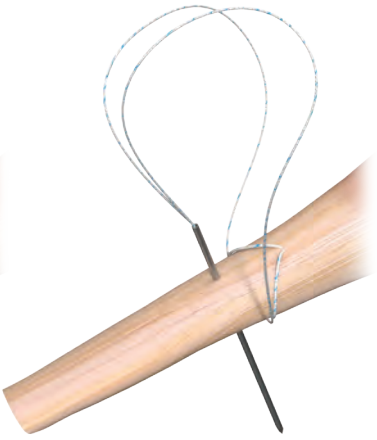


Figure 10c

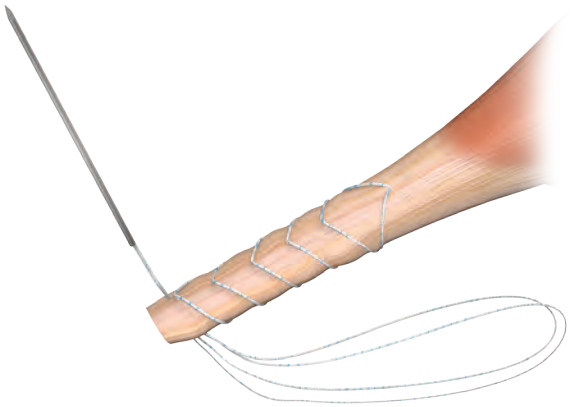


Figure 10d

Attach Tendon to Implant (cont.)

Pull the sutures tight, and then pass the tendon through the looped sutures again (Figure 10b). Advance the needle through the tendon in the same direction, just distal to the previous stitch (Figure 10c). Continue this process distally until the sutures are approximately 8mm from the end of tendon. On the last stitch, pass the needle back up from the under side of the tendon so the suture tails are on the top of the tendon (Figure 10d).

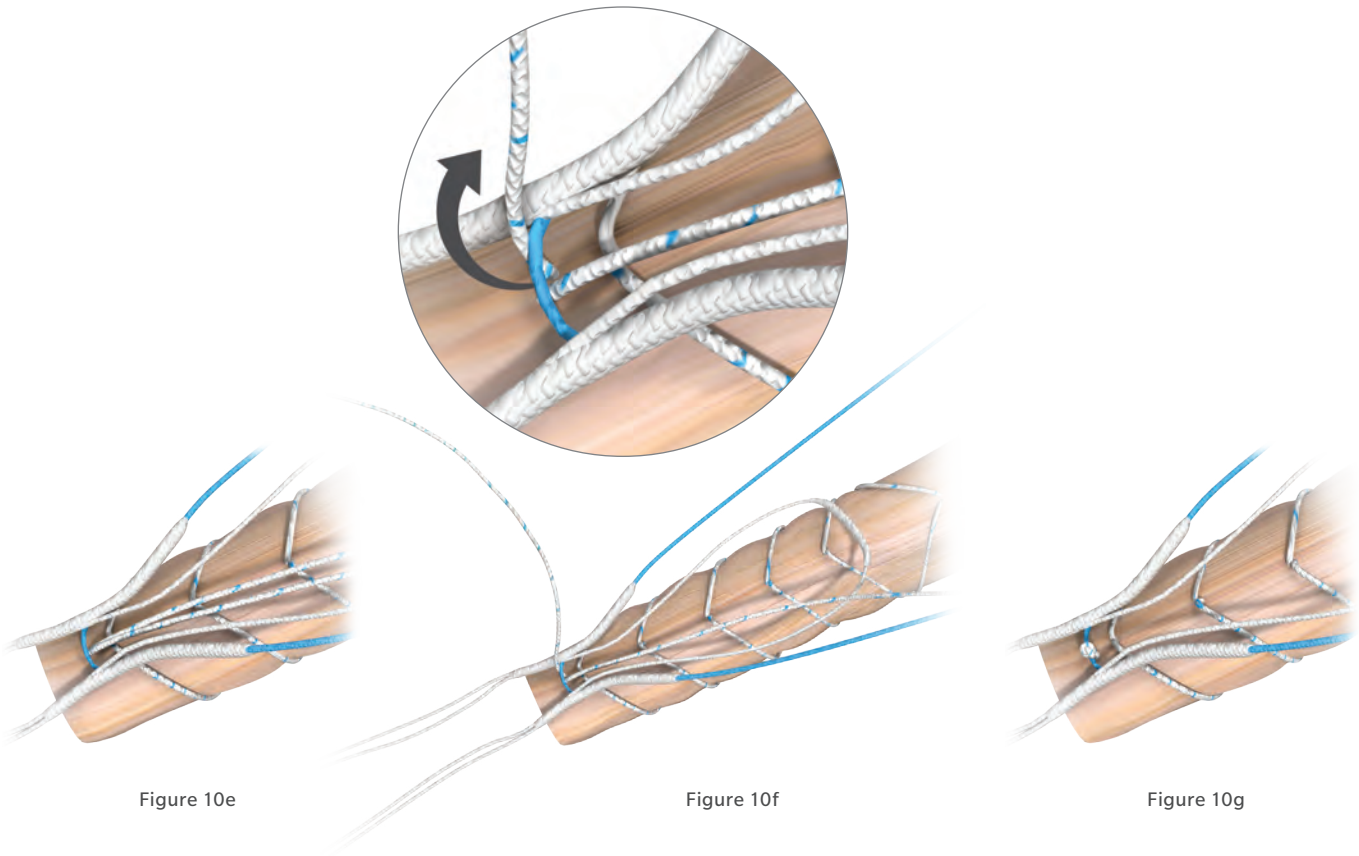


Figure 10e

Figure 10f

Figure 10g

Attach Tendon to Implant (cont.)

Lay the implant out over the tendon so that the blue connection strand is at the base of the suture tails from the ExpressBraid suture. It may be helpful to pre-zip the implant slightly to remove some of the slack from the system. The blue needle strands and ZipLoop pull strand should be extended proximally, and to either side of the tendon (Figure 10e). Remove the needle from the ExpressBraid suture, so two individual strands are left. Pass one of the ExpressBraid suture strands under the blue connection strand, and then tie the two ExpressBraid limbs together over the blue connection strand (Figure 10f). Use 4-5 half hitches. Trim any remaining suture tails from the ExpressBraid sutures (Figure 10g).

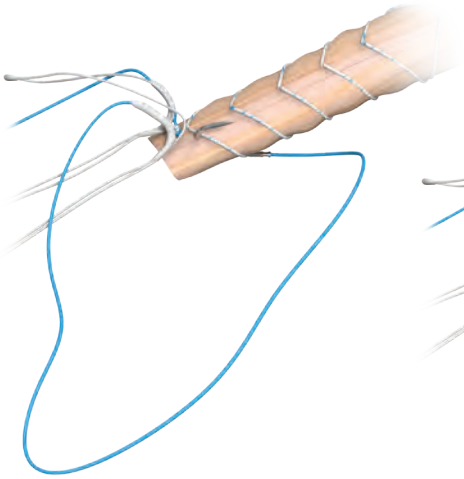


Figure 10h

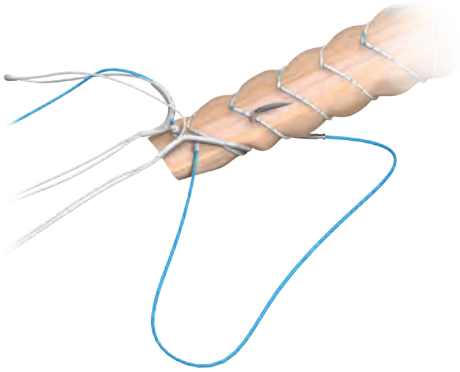


Figure 10i

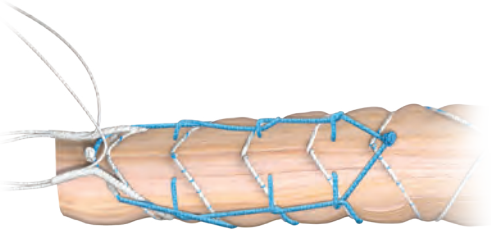


Figure 10j

Attach Tendon to Implant (cont.)

Use the needles from the blue needle strands to attach the implant. Run a Krackow stitch 2-3cm from distal to proximal. Be sure to pull each stitch tight as it is thrown. Do this for both of the blue needle strands (Figure 10h - 10j).

Note: It is especially important to pull the first Krackow stitch tight, as any slack here will be present in the final repair.

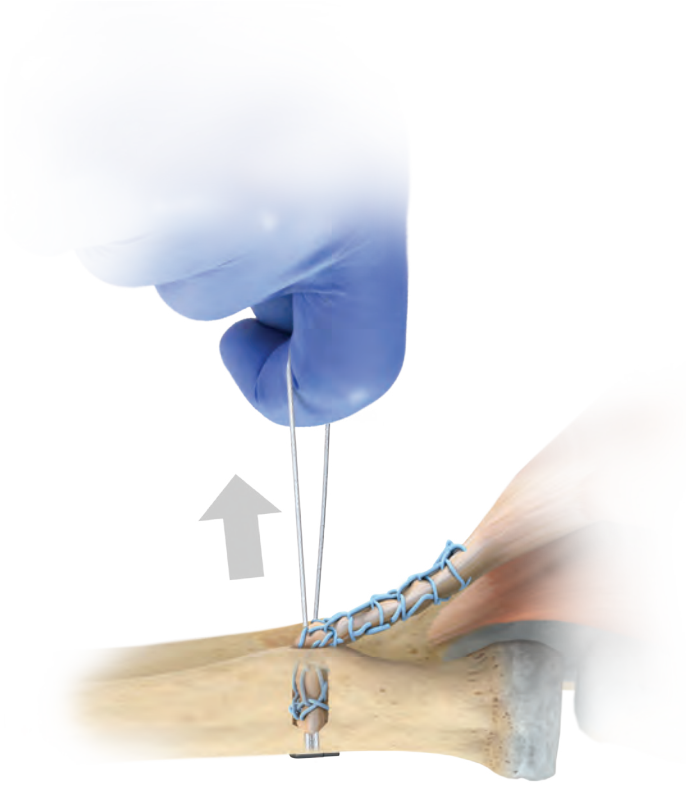


Figure 11

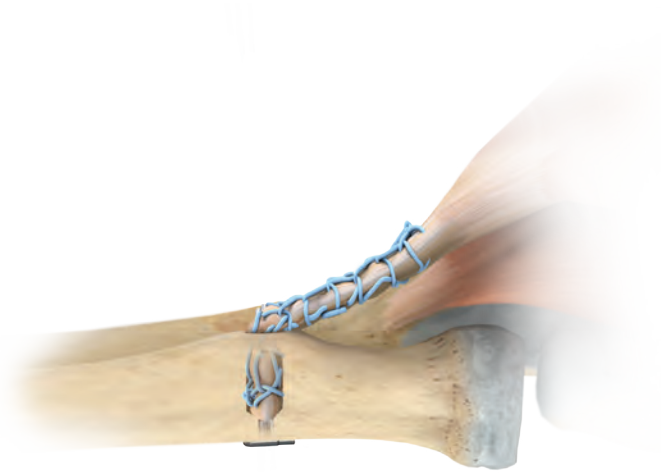


Figure 12

Advance Tendon into Socket

Pull on the white zipping strands to advance the tendon down into the socket (Figure 11). Continue pulling until the tendon bottoms out inside the socket. Cut the zipping strands flush (Figure 12).

Closure

Final fluoroscopic views are obtained. Palpate the tendon to ensure the stump is in the socket. Deflate the tourniquet, maintain the hemostasis, and close up the soft tissues.

Postoperative Rehabilitation

At this point, assess how much tension there is on the repair. If the elbow easily extends to 20° of flexion, it is recommended to set a hinged elbow brace from 30° to full flexion. This may allow for early and active assisted range of motion while protecting the repair.

Ordering Information

Implants

Part Number	Description
110017308	ToggleLoc 2.9 mm Fixation Device with Needles

Instrumentation

Part Number	Description
110018275	JuggerLoc™ 5.0 mm Slotted Reamer
110010371	JuggerLoc 6.0 mm Slotted Reamer
110010372	JuggerLoc 7.0 mm Slotted Reamer
110010373	JuggerLoc 8.0 mm Slotted Reamer
110018366	JuggerLoc 7.0 mm Step Reamer
110026849	JuggerLoc 2.9 mm Short Guide Pin
110017271	JuggerLoc 2.9 mm Guide Pin
110027357	JuggerLoc Disposable Kit (2.9 mm Drill Guide & Guide Pin)

INDICATIONS FOR USE

The ToggleLoc 2.9 and JuggerLoc Soft Tissue System devices are intended for soft tissue to bone fixation for the following indications:

Shoulder
Bankart lesion repair
SLAP lesion repairs
Acromio-clavicular repair
Capsular shift/capsulolabral reconstruction
Deltoid repair
Rotator cuff tear repair
Biceps tenodesis

Elbow
Ulnar or radial collateral ligament reconstruction
Lateral epicondylitis repair
Biceps tendon reattachment

Knee
Extracapsular repair: MCL, LCL, and posterior oblique ligament
Illiotibial band tenodesis
Patellar tendon repair
VMO advancement
Joint capsule closure

Foot and Ankle
Medial/lateral repair and reconstruction
Mid-and forefoot repair
Hallux valgus reconstruction
Metatarsal ligament/tendon repair or reconstruction
Achilles tendon repair

CONTRAINDICATIONS

1. Infection.
2. Patient conditions including blood supply limitations, and insufficient quantity or quality of bone or soft tissue.
3. Patients with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions.
4. Foreign body sensitivity. Where material sensitivity is suspected, testing is to be completed prior to implantation of the device.

Check for country product clearances and reference product specific instructions for use. For complete product information, including indications, contraindications, warnings, precautions, and potential adverse effects, see the package insert or Zimmer Biomet's website.

This technique was prepared in conjunction with a licensed health care professional. Zimmer Biomet does not practice medicine and does not recommend any particular orthopedic implant or surgical technique for use on a specific patient. The surgeon is responsible for determining the appropriate device(s) and technique(s) for each individual patient.

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