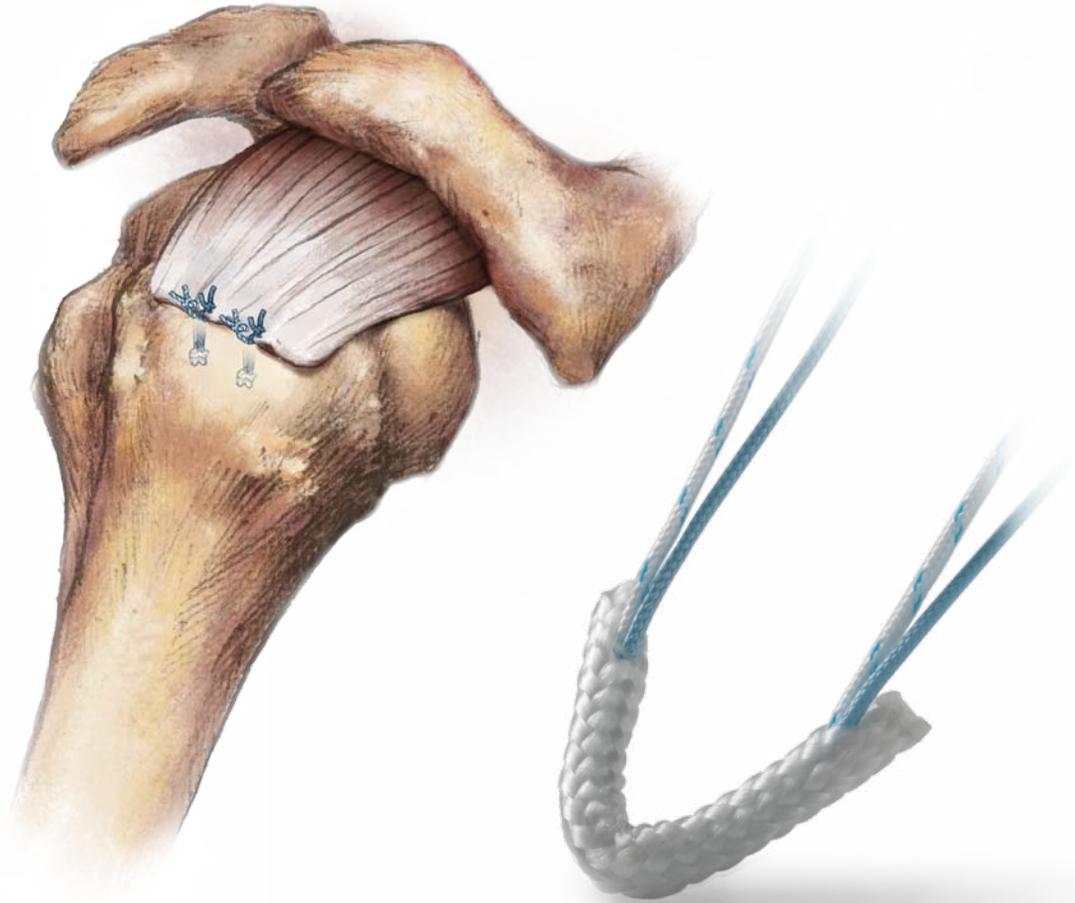


JuggerKnot™ SOFT ANCHOR



**Rotator Cuff Repair using
JuggerKnot™ Soft Anchor—2.9mm
Surgical Technique**

BIOMET®
SPORTS MEDICINE

It's small. It's strong. And it's all suture.

The **JuggerKnot™ Soft Anchor** represents the next generation of suture anchor technology. The 2.9mm deployable anchor design is a completely **suture-based** system, and is the **first of its kind**.

Suture Configuration

- Double loaded with #2 MaxBraid™ Sutures
- Blue-white & Blue colored suture



Soft Material

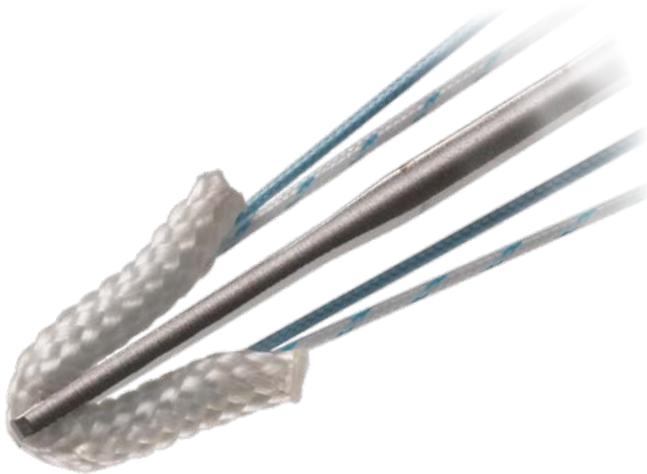
- Soft anchor deployment system—completely suture based implant
- Eliminates the possibility of rigid material loose bodies in the joint
- Polyester implant



This brochure is presented to demonstrate the surgical technique and postoperative protocol utilized by Vivek Agrawal, M.D., Patrick Connor, M.D., Don D'Alessandro, M.D., David J. Chao, M.D., Scott Kuiper, M.D. Biomet Sports Medicine, as the manufacturer of this device, does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient.

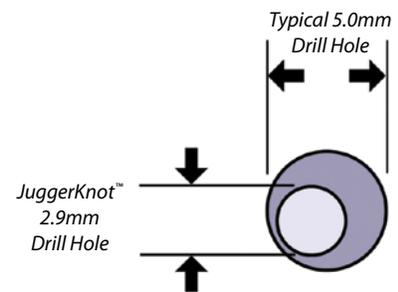
JuggerKnot™

SOFT ANCHOR



Minimal Size

- Smaller drill guide is less invasive to surrounding tissue
- Smaller anchor diameter allows multiple anchors to be placed
- Reduces likelihood of intersecting anchors when placing multiple anchors



Reduced Bone Removal

- The volume of bone removed with the 2.9mm soft anchor is less than that of a 5.0mm traditional anchor.

Surgical Technique

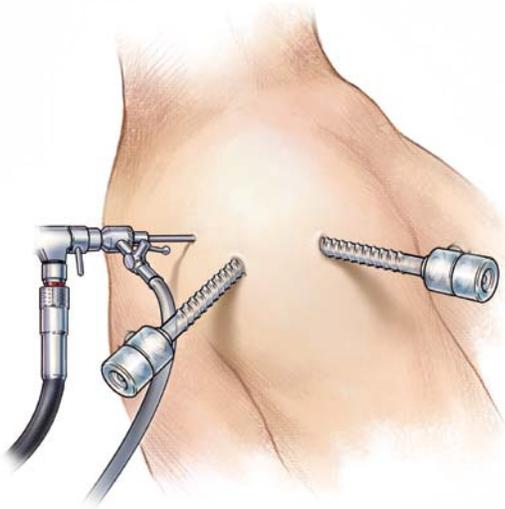


Figure 1

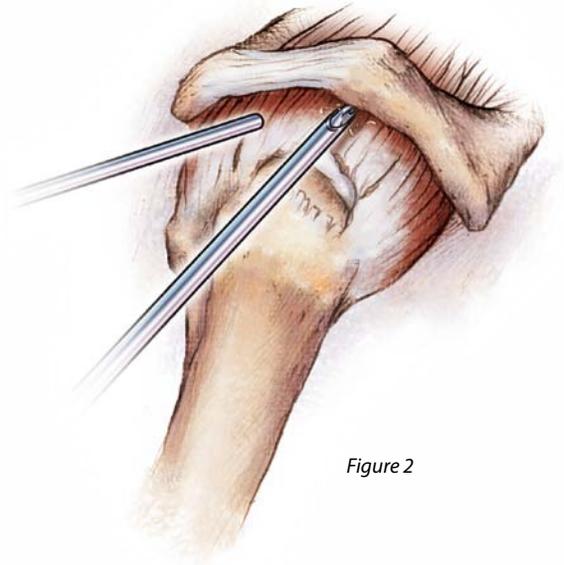


Figure 2

Portal Placement

Place the shoulder in either a Beach Chair or Lateral Decubitus position, depending on surgeon preference. Utilize a standard posterior portal along with a traditional anterior portal for diagnostic arthroscopy and instrument passage. Address intra-articular pathology and evaluate the undersurface of the rotator cuff. Debride frayed or damaged cuff tissue. Then pass the arthroscope into the subacromial space via the posterior portal (Figure 1). To accomplish the subacromial aspects of the procedure, create lateral and anterior portals. As an alternative to the anterior portal, a posterolateral portal can be created. Place the lateral portal about 3 cm directly lateral to the anterior acromial margin. Use this portal for the shaver, burr and suture passing instruments. If desired, place the posterolateral portal midway between the lateral and posterior portals. Placing the arthroscope through this portal allows for improved visualization of the cuff and keeps the posterior portal available for suture management (Figure 1).

Visualization of the Subacromial Space

Visualize the subacromial space using the posterior or posterolateral portal while performing a bursectomy through the lateral portal. Use a combination of a shaver and electrocautery to visualize the subacromial space, acromion, coracoacromial ligament and rotator cuff (Figure 2). Perform any other indicated procedures in the subacromial space such as an acromioplasty, distal clavicle resection or Coracoacromial (CA) ligament release addressing AC Joint pathology prior to repairing the rotator cuff.

Visualize the rotator cuff tear via the posterior or posterolateral portal. Debride the avascular or frayed edges of the cuff to prepare the tissue for repair. Examine the tear from both the various portals to determine tear type, configuration, and size, as well as amount of retraction.

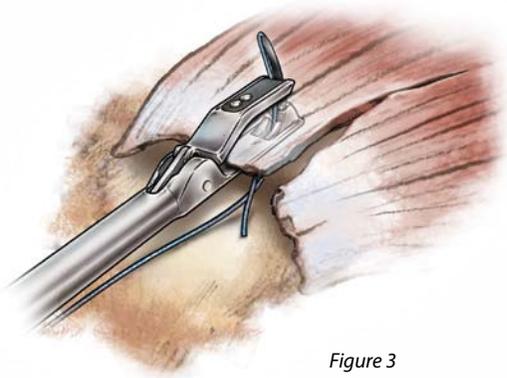


Figure 3

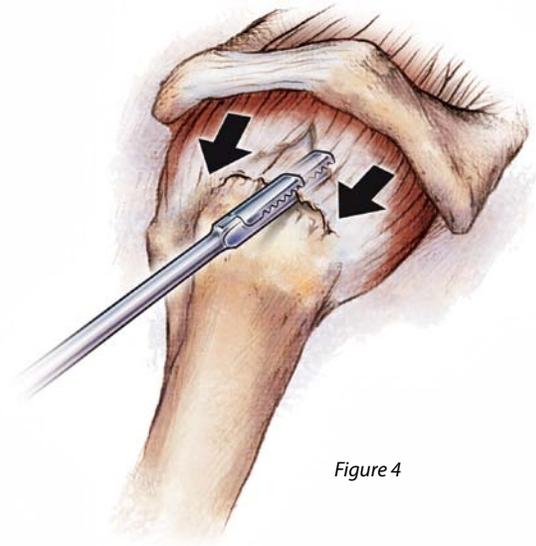


Figure 4

Mobilization of the Rotator Cuff

If retracted, mobilize the rotator cuff by freeing it both superiorly and inferiorly in the planes medial to the glenoid, keeping the anatomic course of the suprascapular nerve in mind to prevent iatrogenic injury. Perform anterior and posterior slide procedures if the rotator cuff is severely retracted and scarred. Utilize margin-convergence techniques to repair splits in the tendon anteriorly and posteriorly. Perform margin-convergence repair using the appropriate passing device or BiPass™ device to pass MaxBraid™ suture across the tear (Figure 3). When repairing anterior and/or posterior splits in the tendon, evaluate the remaining defect for repair to the greater tuberosity.

Utilize a tissue grasper to confirm the tendon can be reduced to bone without any undue tension (Figure 4). While viewing through either the posterolateral or anterior portal and working through the lateral portal, use a high-speed shaver to lightly decorticate the rotator cuff footprint area of the greater tuberosity.

Note: Cortical bone must be present at the sites where suture anchors will be placed.

Surgical Technique

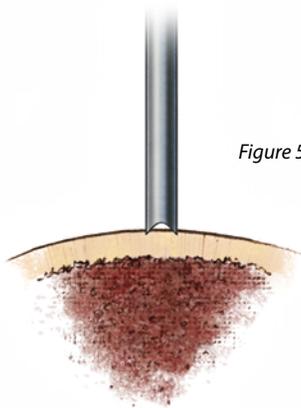


Figure 5

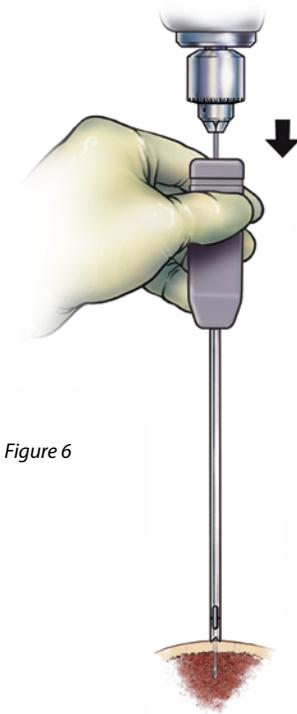


Figure 6

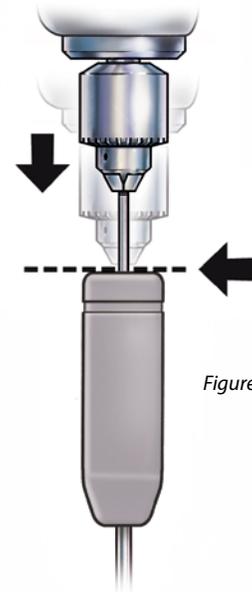


Figure 7

Placement of the JuggerKnot™ Guide

The small diameter of the JuggerKnot™ guide allows easy access to the greater tuberosity for anatomical re-attachment of the cuff. Use a spinal needle to localize and ensure proper location and angle for the guide (Figure 5). Position the JuggerKnot™ guide at the desired angle and location on bone via a cannula or percutaneous portal. For the percutaneous approach use a sharp trocar through a small incision just off the lateral edge of the acromion. Alternatively, use a blunt obturator through a flexible 5 or 7mm AquaLoc® Cannula in the lateral portal.

Drill Pilot Hole

Affix the power drill chuck over the JuggerKnot™ drill bit at the proximal laser-etch line, to determine appropriate depth since the collar of the drill will bottom-out on top of the guide. Insert the JuggerKnot™ drill bit into the drill guide (Figures 6 & 7). Advance drill bit until contact is made between the power drill and the guide. The JuggerKnot in-guide punch can also be used.

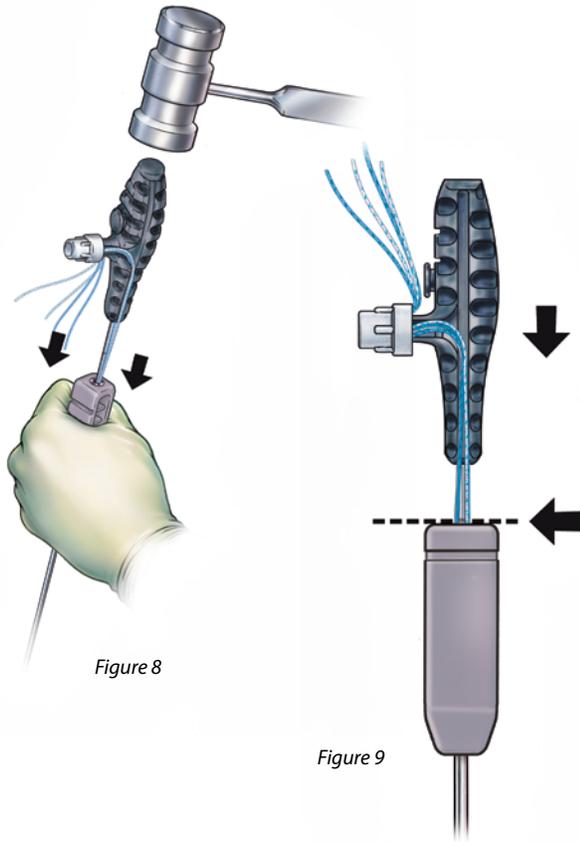


Figure 8

Figure 9

Insert Anchor

Remove the drill. Keeping the guide steady over the drilled hole, do not move it away from hole after drill is removed. **The guide must be positioned exactly over the pilot hole, with no angle deviation with respect to the bone, for proper anchor placement.** While maintaining the guide position firmly against the bone, insert the JuggerKnot™ Soft Anchor through the guide and into the pilot hole. Lightly tap the inserter handle with a mallet until the laser-etch line is even with the top of the guide, to fully seat the anchor into bone. (Figures 8 & 9). **Note: Do not impact inserter handle to the top of the guide, as it may drive the guide through the cortex of the bone.** Double check that the laser etch marks on the inserter are visible in the guide window to ensure anchor is inserted to appropriate depth (Figure 10).

Figure 10

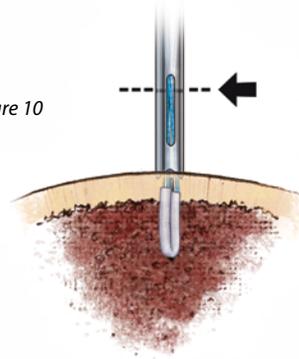


Figure 11

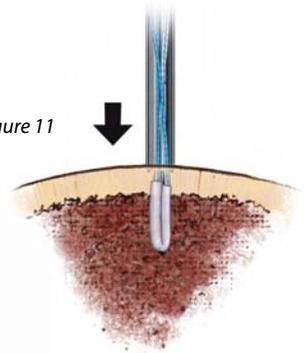
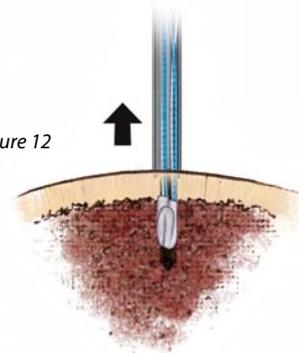


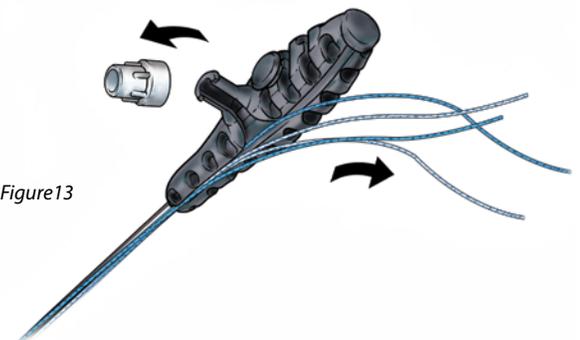
Figure 12



Deploy Anchor

Once anchor is fully seated into bone (Figure 11), pull back firmly until resistance from anchor engagement is felt. This signifies anchor sleeve deployment under the cortex (Figure 12). Once resistance is felt on the sutures, release them from the inserter and remove both the inserter and drill guide. Release sutures from the handle by removing suture retention feature (Figure 13). First remove the inserter by pulling it directly out of the guide, and then remove the guide.

Figure 13



Surgical Technique

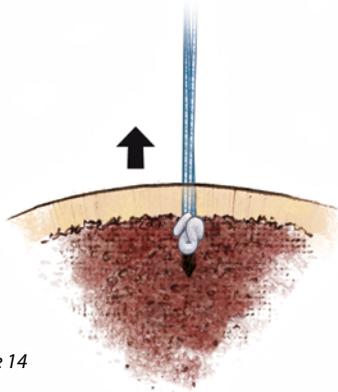


Figure 14

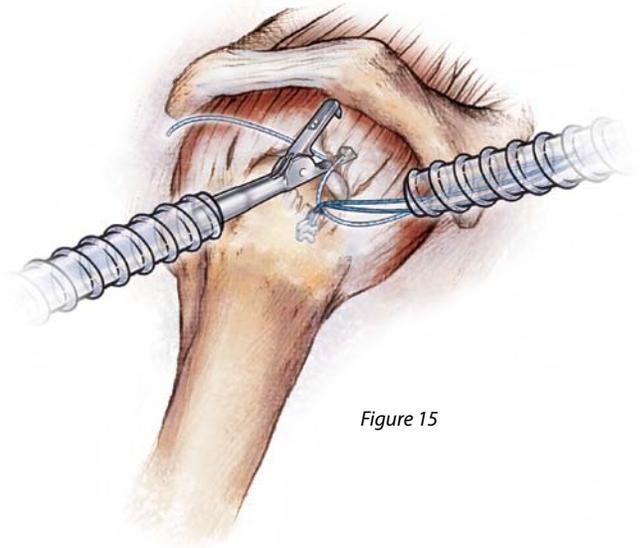


Figure 15

Set the Anchor

Using a slow and steady motion, lightly pull on all four suture limbs by hand to set the anchor. This completes the setting process of the soft suture sleeve expanding up against the proximal cortex. Once the anchor is set, verify that the sutures slide freely for tying arthroscopic surgical knots (Figure 14).

Pass the Suture Through the Rotator Cuff

Pass individual sutures from the anchor out the lateral portal. Use the BiPass™ Suture Passer for passing suture through the rotator cuff tendon (Figure 15). Load MaxBraid™ Suture into the slot on the lower jaw of the BiPass, approximately 2 cm from the end of the suture. Pass suture through the tendon, and back out the lateral portal with the BiPass™ Suture Passer. This suture can then be passed out either the posterior or anterior portal for suture management. This procedure is repeated until one limb of each suture has been passed through the rotator cuff tendon for simple suture repair of rotator cuff to bone.

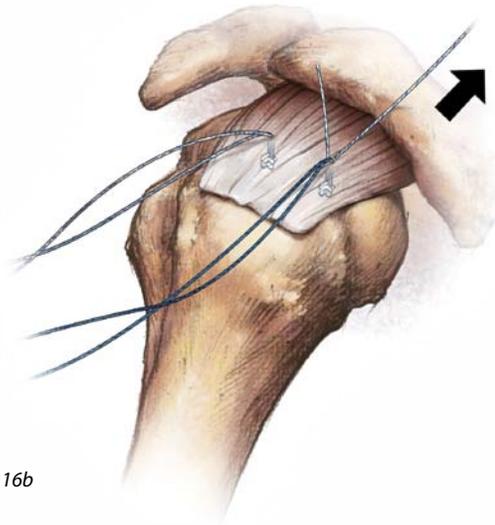
Figure 16a



Single Row Repair

After all sutures have been passed, repair of the tendon progresses from posterior to anterior. Use a secure knot with a minimum of three half-hitches while alternating posts to secure the tendon to the tuberosity. Use a probe to check fixation. Cut the suture limbs with a MaxCutter™ instrument and the Single Row technique is complete using the JuggerKnot™ 2.9mm Soft Anchor (Figure 16a).

Figure 16b



Double Row Repair

If utilizing a double row repair, place the initial anchors along the articular cartilage margin and pass sutures through the tendon 1 cm medial to the lateral edge of the tendon using a horizontal mattress configuration prior to traditional lateral footprint anchor placement (Figure 16b).

Note: A suture can be pulled out of the anchor depending on surgeon preference.



Figure 17

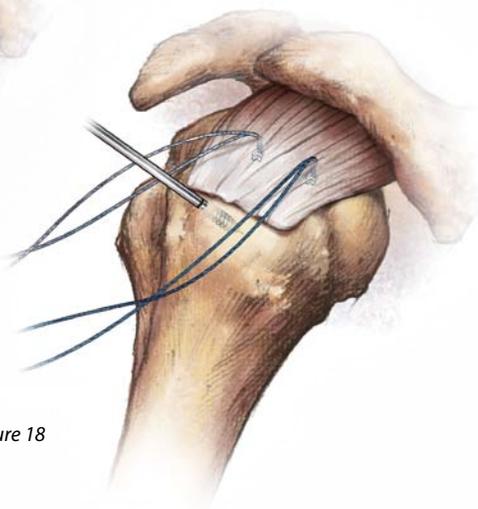


Figure 18

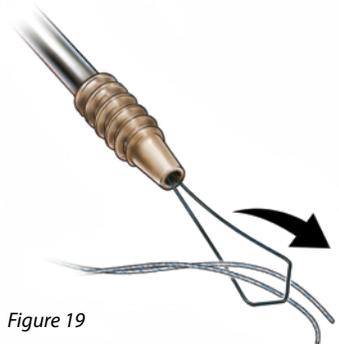


Figure 19

Make a Pilot Hole for the Knotless ALLthread Suture Anchor

Prepare the lateral row pilot hole for the posterior-most lateral anchor through the lateral portal. Debride additional tissue from the tuberosity using a shaver to ensure proper visualization for anchor insertion. Use the Knotless ALLthread Punch to make a pilot hole in soft or intermediate bone (Figure 17). Use a Knotless ALLthread™ Tap to make a pilot hole in hard bone (Figure 18).

Load Suture into Knotless Anchor

Pull one suture limb from the posterior/medial anchor and one suture from the anterior/medial anchor through the lateral portal. Pass approximately 4 cm of each suture end through the passing wire at the tip of the Knotless anchor (Figure 19). Pull the passing wire to deliver the suture ends through the inserter handle and out the slot. Discard the passing wire and hold the suture ends routed out of the slot in the inserter (Figure 20). Up to four suture limbs can be shuttled through the anchor. If shuttling four sutures, load two limbs (2 cm lengths) through one nitinol loop and the remaining two suture limbs (2 cm lengths) through the other nitinol loop.

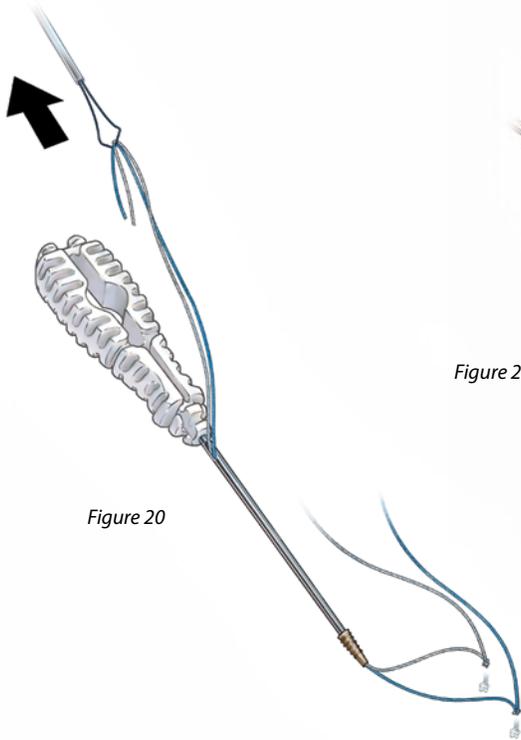


Figure 20

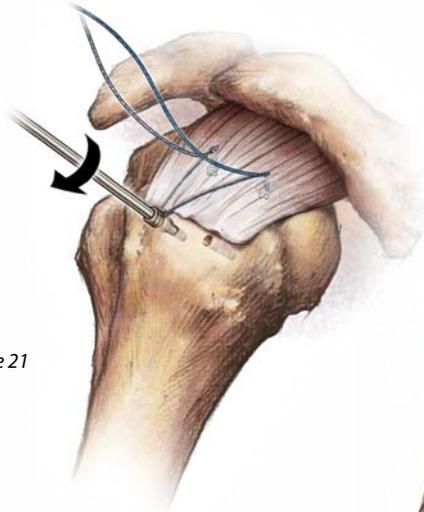


Figure 21

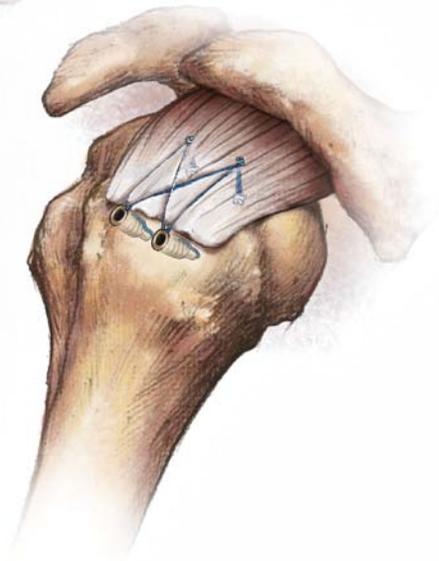


Figure 22

Insert the Knotless ALLthread™ Suture Anchor

Going through the lateral portal, insert the Knotless ALLthread Suture Anchor into the posterior lateral pilot hole (Figure 21). Maintain the same angle of insertion as the Knotless ALLthread™ punch to ensure smooth anchor insertion. The Knotless ALLthread™ Tap may need to be used if it is difficult to find the pilot hole for inserting the anchor.

Completing the Double Row Technique

Lightly pulling the suture ends away from the inserter facilitates control of the suture tension. While maintaining minimal tension on the suture, find the prepared hole with the nose of the Knotless ALLthread™ Suture Anchor. Once the hole is found, apply desired tension for the lateral row anchors and begin screwing in the anchor by hand. As soon as the first threads of the anchor have engaged in bone, surgeons can let go of the sutures and continue firmly screwing in the anchor until it is flush with bone (Figure 21). Pull the inserter handle out of the anchor and cut the suture limbs right over the implanted anchor using a MaxCutter™ suture cutter. Take the remaining sutures from the medial row anchors and repeat the above steps for the spanning technique to secure the lateral/anterior anchor (Figure 22).

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