VERSALOK® Suture Anchor, available in Titanium and PEEK from DePuy Synthes Mitek Sports Medicine, were designed to allow for versatile suture configurations in rotator cuff repair that includes single row, dual row, and suture spanning fixations.

This brochure provides three descriptions of rotator cuff repairs, single row fixation and two double row fixation techniques.
Single Row Repair

Initial Arthroscopy and Cuff Assessment

1. The patient is placed in either the lateral decubitus or beach chair position. After diagnostic arthroscopy, subacromial decompression is performed in the usual fashion.

2. The rotator cuff tear is prepared by gently debriding unstable fragments and degenerative tissues.

3. The type of tear is determined, and an assessment is made as to whether a single or double row repair would be appropriate.

Establish a Working Portal

1. Place the arthroscope in the lateral position and establish 3 additional working portals: anterior, posterior, and a second lateral insertion portal. Clear cannulas are placed in these 3 portals.

2. Gently abrade the bone at the anticipated site of rotator cuff attachment to promote a healing bed for the tendon.
**Single Row**

1. Use a suture-passing device, and pass a strand of ORTHOCORD® High Strength Orthopedic Suture or *ETHIBOND® Suture through the edge of the torn rotator cuff. (When multiple sutures are indicated, it is easiest to place all sutures at this point and retrieve them out of an accessory cannula for later use.)

2. Pass all sutures first, progressing from posterior to anterior and retrieve them out of the posterior cannula. Once all sutures are passed, sutures are retrieved one by one and anchored into place from anterior to posterior using the VERSALOK Suture Anchor.

*ETHIBOND is a registered trademark of ETHICON, Inc.*
Placement of Implant

1. The first pair of sutures are retrieved out of the clear cannula in the lateral insertion portal.

2. Pass both ends of the suture through the VERSALOK Suture Anchor using the quick load tab provided.

3. Slide the trochar tip end of the VERSALOK Suture Anchor down the cannula and position approximately 5mm lateral to the anticipated edge of the attached tendon, taking care not to tangle sutures when advancing anchor to fixation site.

4. Using a mallet, tap the back end of the inserter shaft into bone at the fixation site, advancing the anchor up to the distal edge of the laser line directly before the collar of the insertion device.

Tip: When advancing anchor into joint place nominal tension on the sutures with the opposite hand to create a “zip line” effect to guide the VERSALOK Suture Anchor into the joint while minimizing suture tangling. Once VERSALOK Suture Anchor is in the joint you may release all tension on your sutures to position appropriately.
Placement of VERSALOK Suture Anchor Deployment
Gun and Tensioning of the Sutures

**Note:** Properly mobilize the rotator cuff before tensioning.

1. With the gun in the locked position, advance the VERSALOK Suture Anchor delivery gun down the inserter shaft until it clicks firmly into place.

2. Wrap both ORTHOCORD Sutures over the top and one complete turn around the tensioning wheel in a clockwise direction. Once you pass over your initial sutures, give your sutures a firm tug until you hear an audible click. This will confirm that your sutures are locked in place.

3. Tension the sutures using the tensioning wheel to approximate the rotator cuff tendon to the desired location. Rotate the wheel clockwise to add tension; in case of accidental over-tensioning, you may release wheel to relieve tension by moving the switch to the unlock position and using a probe to loosen sutures and then repeat tensioning steps. Once the position is optimal, the suture will be locked into position. This locks the suture into the anchor and expands the anchor so that it locks into the bone.

**Note:** This is an extremely important step. The VERSALOK Suture Anchor will lock the suture and fixate the tendon wherever the surgeon chooses, based on how much tension is placed on the sutures. Once the anchor is deployed and locked, no further tensioning is possible.
Deployment of Anchor and Locking of Suture

1. Fully squeeze the trigger of the delivery gun to deploy the anchor pin into the anchor sleeve until it is fully seated.

2. Release the trigger fully and flip the switch to the unlocked position at the back of the delivery gun to release the gun, as well as to release the sutures from the tensioning wheel.

3. Remove the delivery gun while holding the switch in the unlocked position with your thumb.
4. Unthread the inserter shaft from the distal tip of the VERSALOK Suture Anchor by rotating the inserter shaft in a counter-clockwise direction. Use the end cap to facilitate this step. Once unthreaded, completely remove the inserter shaft.

5. After placement of the VERSALOK Suture Anchor, its integrity in bone and suture tension on the repaired tendon should be assessed utilizing a soft tissue probe. The suture limbs are then cut using the Cord Cutter.

6. Completed repair. If necessary, additional VERSALOK Suture Anchor may now be placed using the same technique.

**Variation:** Inverted Mattress stitch or 2 Simple stitches.

*As an advanced technique, these suture limbs may be utilized again, passing one limb through additional cuff tissue and tying a non-sliding arthroscopic knot.*
Double Row Repair

Medial and Lateral Cuff Fixation Technique

1. The medial row of sutures is placed utilizing an “anchor first” technique. Depending upon the size of the tear, 1 or 2 VERSALOK Suture Anchors are utilized.

2. Load suture into the VERSALOK Suture Anchor outside the joint, then insert VERSALOK Suture Anchor adjacent to the articular margin, at the medial edge of the rotator cuff footprint. Deploy the anchor into place.

3. Pass a suture approximately 2 cm from the free edge of the rotator cuff tear utilizing the any one of a variety of suture passing devices. Repeat this step for the other sutures. Retrieve all four suture ends through the posterior cannula and clamp for later tying. The medial sutures are tied after the lateral row has been completed.

4. Place lateral row sutures using a “suture first” technique. Place the lateral anchors at least 5mm lateral to the anticipated final position on the free edge of the cuff tear. Once desired position of the rotator cuff on the tuberosity is achieved, fully squeeze the trigger on the VERSALOK Suture Anchor to deploy the VERSALOK Suture Anchors and lock sutures in place.

5. After all lateral sutures are locked into place, tie the medial row of sutures using a non-sliding knot technique.
Double Row Medial Fixation Suture Cross Spanning Technique

1. After placing the medial anchor and passing the sutures medially, tie the medial sutures. Then utilize these same sutures to cross over the tendon and lock the suture ends into the lateral cortex using 2 additional VERSALOK Suture Anchors. This gives a large footprint of tendon compression.
Double Row Medial Fixation
Criss-Cross Spanning Technique

For larger tears, 2 medial anchors may be placed. Two double loaded suture anchors are used and two free ends of suture from each anchor are passed and tied in a horizontal mattress configuration. The other suture limbs from each anchor are then passed in a criss-cross pattern and fixated to the lateral cortex with VERSALOK Suture Anchors to achieve optimal footprint compression.

Open Technique Variation
1. After the subacromial decompression is performed, a mini-deltoid splitting approach is performed. Sutures may be placed through the open incision, or placed arthroscopically and retrieved through the open incision.
2. The procedure is performed in the same fashion as the arthroscopic technique, with elimination of the need for a cannula.

Tips and Pearls
For hard bone, always use the awl to penetrate the cortex prior to inserting the anchor. Try to avoid twisting the sutures in the cannula when passing the anchor down the insertion cannula.

If the cuff is being over-tensioned, the anchor may start to back out a couple of millimeters prior to deploying. If this occurs, release the tension on the suture by releasing the tension wheel (unlocked position). Once tension is released, return the button to the locked position and then the surgeon may impact the anchor further.

As with all anchors, try to avoid placing anchors too close to one another. It is best to leave a 5mm minimum bridge between anchors if possible.
Dual Row Spanning

Setup and Positioning

The important element of positioning is being able to adduct the arm to allow proper anchor placement in the Deadman’s angle at the medial aspect of the footprint.

Portal Placement

There are 3 main portals that are necessary to perform this technique:

1. A standard posterior portal is made approximately 2 cm medial and 2 cm distal to the posterolateral tip of the acromion
2. An anterior portal in the rotator interval just lateral to the coracoid
3. A lateral portal which is approximately 1 cm posterior and 3 to 4 cm distal to the anterolateral tip of the acromion

Diagnostic Arthroscopy

Inspection of the glenohumeral joint is performed to diagnose the presence of concomitant pathology to the biceps tendon, labral tissue, and articular surfaces. The cuff tear is thoroughly inspected to determine tear size, tissue quality, amount of retraction, the tear pattern, and the number of tendons involved. Based on this inspection, a plan is devised to address.
Anchor Placement

With the scope in the posterior or posterolateral portal, a spinal needle is used to localize an accessory skin portal that is just at the lateral aspect of the acromion and is usually at the anterior-most aspect of the acromion. The spinal needle is used to confirm that the anchor can be placed at a 45° Deadman’s angle. The first anchor is placed through this accessory portal right at the articular margin of the footprint. After the anchor is seated and checked for stability, the sutures are passed through the cuff.
Suture Passage

1. The lateral portal is preferred as the viewing portal because it permits a “50-yard line” view of the cuff tear. This enables accurate placement of sutures through the cuff. This is especially important in cases of larger tears with delamination of the posterior aspect of the cuff. Sutures are passed approximately 20 mm medial to the free edge of the tendon in a retrograde fashion using a penetrating suture grasper such as the Cleverhook Instrument. A spinal needle and a shuttling device such as prolene suture or the CHIA PERCPASSER® Suture Passer may also be used.

Alternatively, a posterior or posterolateral portal may be used as the viewing portal and sutures may be passed in an antegrade fashion using the EXPRESSEW® III Flexible Suture Passer. In some cases, a Neviser portal made just posterior to the AC joint is created under spinal needle guidance and utilized for suture passage through the central portion of the cuff tear.

The spinal needle is used again to confirm that the 2nd anchor can be placed at a Deadman’s angle approximately 1 cm posterior to the first anchor through the same accessory portal. If this cannot be accomplished through the same portal, then a 2nd accessory portal is made.
Knot Tying – for Medial Row

All 4 sutures from the 2 medial anchors should be passed prior to knot tying. The sutures from each of the medial anchors are tied in a mattress configuration using a sliding square knot. Any type of sliding knot may be used for this technique. Two alternating half-hitches are tied on the post-stitch. The post is switched and 2 additional half-hitches are tied. Do NOT cut these sutures. These suture strands are used to span over the lateral cuff to accomplish the dual row repair.
Spanning Technique

1. With the scope in the accessory lateral portal or the posterolateral portal, if necessary with hard bone, a 2.9 mm VERSALOK Awl or drill is used to place 2 holes about 1.5 cm apart in the lateral cortex of humerus approximately 1.5 cm from the superior aspect of the greater tuberosity. At this point, 1 suture from the anterior anchor and 1 suture from the posterior anchor are retrieved through the lateral portal. These do not need to be retrieved through a cannula. The suture strands are passed through the VERSALOK Suture Anchor using the quick load tab.

2. The anchor is malleted into the lateral humerus to the distal edge of the laser line directly before the collar of the insertion shaft. Before deployment, the suture strands should be tightened manually to remove slack. Each strand can be tightened individually, or both sutures can be tightened at once. Care should be taken not to over-tighten the sutures because this can unseat the anchor out of the drill hole. The sutures can be tightened using the tensioning wheel that is located on the VERSALOK Suture Anchor Deployment Gun by turning the wheel clockwise. The tension on the suture may be checked using a probe. It is possible to loosen the tension on the sutures by releasing the sutures from the tensioning wheel.

3. Once the proper tension is obtained, the trigger on the deployment deployment gun is pulled and this locks the inner sleeve into the outer sleeve of the anchor. The gun is removed and the inserter shaft is turned counterclockwise to remove it from the VERSALOK Suture Anchor. The extraneous sutures that remain sticking out from the anchor may be cut with scissors or the Cord Cutter. Alternatively, the sutures may be used to pass through a portion of the cuff that sticks up in a dog-ear fashion. The same steps are repeated for the other 2 suture strands and the remaining VERSALOK Suture Anchor.
Completed Repair

Anchors are secured medially with sutures from the anchor tied in a horizontal mattress configuration. These limbs are then spanned laterally in a suture criss-cross format to VERSALOK Suture Anchors laterally.

Alternative Repair Patterns

1. In this repair, after securing anchors medially, sutures are then passed through the rotator cuff and spanned laterally and fixated in place with VERSALOK Suture Anchors.

2. In this repair, FASTIN® RC Threaded Anchors are secured medially with sutures from the anchor tied in a horizontal mattress configuration. These limbs are then cut to fixate the rotator cuff medially. Sutures are then passed laterally in a suture-first technique and placed into two VERSALOK Suture Anchors laterally to secure the rotator cuff laterally.
## VERSALOK Suture Anchors & Instruments

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CHIA PERCPASSER Suture Passer
CLEVERHOOK Instrument
IDEAL Suture Shuttle, Grasper
IDEAL Suture Shuttle
EXPRESSEW III Flexible Suture Passer

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