Arthroscopic Shoulder Instability Repair Using the SUTUREFIX ULTRA Suture Anchor and SUTUREFIX ULTRA Instrumentation System
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Introduction

Arthroscopic instability repair in the shoulder such as capsulorrhaphy, labral repair, and SLAP repair is a demanding procedure. Access to a labral tear, anchor placement, suture management, and proper repair of the affected area can be challenging, and performing a repair properly while limiting the amount of bone removal is essential.

Designed with these challenges in mind, the SUTUREFIX ULTRA Suture Anchor mitigates some of the difficulties typically encountered during arthroscopic instability repair. It is a small suture-based anchor, preloaded with ULTRABRAID™ Suture. Due to its small size, it can decrease bone removal and increase anchor placement options along the glenoid while providing the necessary fixation strength. The SUTUREFIX ULTRA Anchor is designed for use with the SUTUREFIX ULTRA Instrumentation System. This customized shoulder instrumentation, developed primarily for instability repair, is available separately.

The SUTUREFIX ULTRA Instrumentation System includes multiple configurations of guides, tips, obturators, and drills, providing a wide range of options to surgeons. The stainless steel instrumentation is available single-use or reusable, cannulated for percutaneous approach, and in disposable packs. Each guide has an ergonomic handle designed to aid surgeons while accessing the tear site and facilitating anchor insertion.

The SUTUREFIX ULTRA Suture Anchor and SUTUREFIX ULTRA Instrumentation System together enable a targeted repair, with the additional benefits of decreasing bone removal, thus increasing the number of possible fixation points along the glenoid (Figure 1).¹

Figure 1

Patient Positioning

The surgeon can use the SUTUREFIX ULTRA Suture Anchor and SUTUREFIX ULTRA Instrumentation System when the patient is in either the beach chair or the lateral decubitus positions. The SPIDER 2 Limb Positioner (Figure 2), which allows control of abduction, rotation, and forward flexion in both beach chair and lateral decubitus positions, with both forward and downward traction, can be used.
Portal Placement

1. Drape the shoulder so that the surgeon has unrestricted access to the shoulder.
2. Make a posterior skin incision 1.5 cm inferior and 1.5 cm medial to the posterolateral border of the acromion to establish a standard posterior portal at the soft spot.
3. Insert a Smith & Nephew CLEAR-TRAC® COMPLETE Cannula and a blunt trocar through the posterior portal and into the glenohumeral joint. Typically, the posterior portal is used for arthroscopic visualization. Establish an anterior-superior portal in the rotator cuff interval. This portal will be used for the non-operative cannula.
4. Use an arthroscopic needle to define the anterior-inferior portal so that the operative cannula enters the shoulder immediately superior to the subscapularis tendon (Figures 3 and 4).

Joint Inspection And Tissue Preparation

1. Using the arthroscope, inspect the glenohumeral joint. Re-examine the shoulder.
2. Use an arthroscopic probe to assess labral attachment and ligament tension accurately. Ensure that the capsulolabral structures are well-mobilized to allow for an anatomic repair or adequate advancement of tissue, if needed.
3. Confirm the diagnosis of glenohumeral instability.
4. Prepare the tissue as preferred. Debride all soft tissue from the glenoid neck at the rim level and below the rim using a 4.5 mm, concave, curved Smith & Nephew INCISOR® Blade. If necessary, use a Smith & Nephew 4.5 mm Shielded Burr to roughen the bone to promote tissue healing.

Technique

It is necessary to utilize the appropriate Smith & Nephew instrumentation to prepare the insertion site and to maintain axial alignment between the insertion site and the SUTUREFIX Ultra Suture Anchor. Surgeons must use their professional judgment to determine the appropriate suture anchor instrumentation length based on the specific indication, preferred surgical technique, and patient history.
Select a drill bit size that corresponds with the guide size.

1. Place the obturator in the guide to ensure that no tissue or debris obstructs the guide during the procedure. The obturator can be used to lock or unlock to the guide as the surgeon prefers. Ensure that the guide moves freely in the operative cannula (Figure 5).

2. Move the guide tip to the desired position on the glenoid rim or face. Place the distal tip of the drill guide onto the bone at the desired implantation site. Maintain forward pressure on the guide to prevent the guide from slipping off the bone.

3. Remove the obturator and hold the drill guide firmly in place.

4. Choose the appropriate suture anchor drill bit to prepare the insertion site and place the drill bit into the guide.

5. Begin to drill. As the drill bit tip engages bone, be sure to keep the guide and drill bit aligned (Figure 6).

**Note:** Maintain guide alignment throughout drilling to ensure drill bit integrity.

6. Continue to drill until the drill bottoms out against the guide.

**Note:** The depth stop on the drill bit bottoms out on the handle of the drill guide when the proper hole depth is reached.

7. Keeping the drill in forward mode, remove the drill bit from bone and guide.

**Note:** Perform insertion, drilling, and extraction in a single motion if possible.

8. Continuing to hold the drill guide firmly in place, insert the suture anchor into the guide with the desired suture orientation.

**Note:** To insert the anchor, push or gently tap the proximal end of the anchor handle (Figure 7).
9. Once the anchor is in the bone, continue to tap the handle of the inserter until it is completely seated on the top of the guide handle. This positions the suture anchor at the appropriate depth below the surface of the bone (Figure 8).

10. One the anchor is completely inserted in the bone, deploy the suture anchor:
   a. Keep the drill guide in place and maintain downward pressure on the inserter handle (Figure 9).
   b. Press the white lock button on the handle to unlock the sliding ring (Figure 10).
c. To deploy the anchor, pull back on the sliding ring until a click is heard. This click confirms proper anchor deployment in the bone (Figure 11).¹

d. Unwind the suture from the exposed suture cleat (Figure 12).

**CAUTION:** *Do not use sharp instruments to manage or control the suture.*

11. Pull back slowly on the suture anchor handle to remove the insertion device from the drill guide. The anchor will remain in the bone and the suture will feed through the handle as it is removed. Discard the insertion device.

12. Remove the guide (Figure 13).

13. Reapply tension to the suture to confirm the stability of the suture anchor in the implantation site. The anchor may migrate 1 mm until it catches the cortex.

¹ 15002117 Validation, SUTUREFIX Ultra, "S" Repair System.
14. Insert the ACCU-PASS® Suture Shuttle through the operative cannula and through the labrum and capsule to be reattached or shifted.

15. Advance the ACCU-PASS device's monofilament loop into the joint space by rolling on both suture shuttle side wheels in a downward motion. Do not remove the suture shuttle from the site.

16. Utilizing the non-operative cannula, pass the ELITE® Premium Loop Vertical Grasper through the monofilament loop and grab one limb of the ULTRABRAID® Suture. Pull the suture back through the monofilament loop and out through the non-operative cannula.

17. Remove the suture shuttle from the joint. The suture that was positioned in the loop will pass through the labrum and capsule tissue.

18. Secure the tissue repair using the preferred technique (Figures 14 and 15).

19. When the anchor placement is complete, use the Smith & Nephew Suture Cutter to cut the suture limbs, removing any excess suture.

20. Repeat Steps 1–19 to place additional anchors and complete the repair (Figure 16).
Alternative Techniques

If using the double-loaded SUTUREFIX ULTRA Suture Anchor:
1. Perform steps 1–18 using the double-loaded SUTUREFIX ULTRA Suture Anchor. This allows placement of one anchor with two points of fixation along the glenoid for more tissue compression (Figure 17).
2. Repeat Steps 13–19 for the second ULTRABRAID colored suture.
3. Tie the suture using the preferred knot tying technique.
4. Secure the repair.
5. Use the Smith & Nephew Suture Cutter to cut the suture limbs and remove any excess suture (Figure 18).

Figure 17

Figure 18
Technique Pearls

- Use a CLEAR-TRAC® COMPLETE Threaded Cannula with a minimum diameter of 8.5 mm or an 8.0 mm x 72 mm CLEAR-TRAC FLEXIBLE Threaded Cannula with ACCU-PASS® Suture Passers to ease access to site.

- The following SUTUREFIX ULTRA instruments and anchors are compatible:

<table>
<thead>
<tr>
<th>Drill Guide</th>
<th>Drill Bit</th>
<th>Anchor</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>1.7 mm S</td>
<td>1.7 mm S</td>
</tr>
<tr>
<td>XL</td>
<td>1.7 mm XL</td>
<td>1.7 mm XL</td>
</tr>
<tr>
<td>S</td>
<td>1.9 mm S</td>
<td>1.9 mm S</td>
</tr>
</tbody>
</table>

- The depth stop on the drill bit bottoms out on the handle of the drill guide when proper hole depth is reached.

- When drilling, ensure that the drill guide is secure on the bone to avoid inadvertent drill slippage.

- Press the lock button prior to deployment of the anchor.

- Do not rotate the suture anchor device once it is seated in the bone.
SUTUREFIX ULTRA Suture Anchor, undeployed

SUTUREFIX ULTRA Suture Anchor, deployed
Ordering Information

To order the instruments used in this technique, call +1 800 343 5717 in the U.S. or contact an authorized Smith & Nephew representative.

Prior to performing this technique, consult the Instructions for Use documentation provided with individual components – including indications, contraindications, warnings, cautions and instructions.

SUTUREFIX ULTRA Anchors and Instrumentation Systems

<table>
<thead>
<tr>
<th>Reference #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anchors</strong></td>
<td></td>
</tr>
<tr>
<td>72203852</td>
<td>SUTUREFIX ULTRA Anchor 1.7 mm S Solid Blue</td>
</tr>
<tr>
<td>72203853</td>
<td>SUTUREFIX ULTRA Anchor 1.7 mm S Cobraid Blue</td>
</tr>
<tr>
<td>72203854</td>
<td>SUTUREFIX ULTRA Anchor 1.9 mm S Cobraid Blue/Blue</td>
</tr>
<tr>
<td><strong>Drills</strong></td>
<td></td>
</tr>
<tr>
<td>72203855</td>
<td>Twist Drill 1.7 mm S</td>
</tr>
<tr>
<td>72203856</td>
<td>Twist Drill 1.9 mm S</td>
</tr>
<tr>
<td><strong>Guides &amp; Obturators</strong></td>
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</tr>
<tr>
<td>72203859</td>
<td>Drill Guide Fishmouth Tip, Reusable, S</td>
</tr>
<tr>
<td>72203858</td>
<td>Drill Guide Spike Tip, Reusable, S</td>
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<tr>
<td>72203857</td>
<td>Drill Guide Crown Tip, Reusable, S</td>
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<tr>
<td>72203862</td>
<td>Obturator, Cannulated, Reusable, S</td>
</tr>
<tr>
<td>72203863</td>
<td>Obturator, Trocar Tip, Reusable, S</td>
</tr>
<tr>
<td>72203861</td>
<td>Obturator, Blunt tip, Reusable, S</td>
</tr>
</tbody>
</table>

ELITE PREMIUM II Shoulder Arthroscopy System

72203053 Flush Suture Cutter

ACCU-PASS* Suture Shuttles

7210423 45º, Left, Sterile
7210424 45º, Right, Sterile

**CAUTION:** U.S. Federal law restricts these devices to sale by or on the order of a physician.