Arthroscopic Rotator Cuff Repair with the Elite™ Shoulder System

James C. Esch, M.D.
Rotator cuff tears are a significant cause of shoulder pain. These tears should be repaired if the patient has pain and weakness that interferes with their lifestyle. A smoothing of the subacromial arch (subacromial decompression) is done at the same time as the repair, unless there is tenuous repair of a massive tear. An MRI will provide the surgeon and patient with an approximation of the tear size. Visualization is enhanced by use of a fluid inflow pump system on the scope (the Smith & Nephew Dyonics® IntelliJET™ Arthroscopic Fluid Management System), by a safely lowered systolic blood pressure to 95 mmHg, and cauterization of any bleeding vessel. The surgeon must be aware of movements of the arthroscope, and must be proficient in the use of the Elite™ Shoulder Instruments, in suture management, and in arthroscopic knot tying.

This guide illustrates creation of a tension-free repair using a combination of side-to-side margin convergence and tendon to bleeding bone using suture anchors. The exact steps depend on an awareness of the tear size and shape.
Introduction

The Elite™ Shoulder System has been specifically designed to offer a complete approach to arthroscopic rotator cuff repair.

In describing this technique Dr. James Esch utilizes specific components of the comprehensive Elite™ system to illustrate the details of repairing an “L”-shaped tendon tear.

The procedure illustrated in this guide utilizes the following components:

**Anchor**

RC5™ Ti™ Suture Anchor (5.0 mm)

**Suture**

#2 braided polyester
(pre-loaded, two per anchor)

**Instrumentation**

Elite™ Calibrated Probe
Elite™ Cuff Stitch™ Suture Relay, 70° Right Bend
Elite™ Cuff Stitch™ Suture Relay, Straight
Arthro-Pierce™ Instrument
Elite™ Suture Manipulating Grasper
Elite™ Combination Tissue/Suture Grasper
Elite™ Knot Manipulator™, Full Loop
Elite™ Double Hook Suture Scissors

* See the *Ordering Information* section on Page 14 for the complete Elite™ Gold and Arthro-Pierce™ Instrument Systems.
Procedure

Operative Site Access

Three portals are used during this procedure – the posterior, anterior and lateral working portals. An accessory anterior incision is also created for anchor insertion.

An arthroscope is inserted into the posterior portal (Figure 1).

An “L”-shaped tear is used to demonstrate this technique. Figure 2 shows an “L”-shaped tear in the anterior part of the supraspinatus tendon.

Reducing the Tear

The Elite™ Calibrated Probe, placed through the anterior portal, is used to reduce the tear (Figure 3). Note: a tissue grasper can also be used for reduction of the tear.

Figure 1. Arthroscope in posterior portal. The circle shows the location of the accessory anterior portal for anchor insertion.

Figure 2. “L”-shaped tear

Figure 3. Calibrated probe reducing tear
**Side-to-Side Suturing**

The arthroscope is repositioned into the lateral portal. A straight Elite™ Cuff Stitch™ Suture Relay from the posterior portal is used to pass a suture across the tear. The suture is grasped with an Elite™ Combination Tissue/Suture Grasper inserted through the anterior portal (Figure 4).

The suture manipulating grasper is then removed. The Elite™ Full Loop Knot Manipulator is inserted through the posterior portal and used to tie a knot (Figure 6a). For more detail on knot tying, see page 12.

The knot is tightened by advancing the knot manipulator into a past point position (Figure 6b).

The sutures are cut using the Elite™ Double Hook Suture Scissors (Figure 6c). Alternatively, the Elite™ Sliding Suture Cutter can be utilized.

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**Figure 4. Suture passed across tear and grasped with tissue/suture grasper**

**Figure 5. Suture manipulating grasper retrieving suture**

**Figure 6a. Knot tied**

**Figure 6b. Knot tightened**

**Figure 6c. Cut sutures**
The Second Side-to-Side Suture

An alternative method for side-to-side suturing is the suture hand-off. The suture is handed from the straight Elite™ Cuff Stitch Suture Relay in the posterior portal to the Arthro-Pierce™ Instrument in the anterior portal (Figures 7a and 7b). The Elite™ Suture Manipulating Grasper is then used to retrieve the suture (Figure 7c).

Figures 7a and 7b. Suture handed from suture relay to Arthro-Pierce™ Instrument.

Figure 7c. Grasper retrieving suture
Inserting the First Anchor

An accessory incision is used for the anchor insertion. It is adjacent to the lateral margin of the acromion (Figure 8).

The first anchor is inserted (Figure 9a). Rotate the anchor approximately 45 degrees so it is more under the articular surface (Figure 9b).

The anchor should be inserted up to the first laser etched mark on the distal end of the inserter. This ensures that the top of the anchor is below the bone surface. The vertical laser mark can be utilized to place the sutures in the desired orientation.
Suturing Tendon to Bone

The white sutures are transferred from the accessory portal to the posterior portal with the Elite™ Suture Manipulating Grasper (Figure 10a).

The 70° Right Elite™ Cuff Stitch™ Suture Relay with the white suture loaded is then passed through the cuff. The suture is retrieved with the Elite™ Combination Tissue/Suture Grasper from the anterior portal (Figure 10b).

Next, the suture manipulating grasper is used to retrieve the suture from the posterior portal (Figure 10c), leaving the white suture through the tendon with both strands out of the posterior portal.
The green suture is then passed using the same steps. The grasper is used to transfer the green sutures from the accessory portal to the posterior portal (Figure 10d).

The 70° Right Elite™ Cuff Stitch Suture Relay is passed through the cuff with the green suture loaded. The suture is retrieved with the Elite™ Combination Tissue/Suture Grasper from the anterior portal (Figure 10e).

The Elite™ Suture Manipulating Grasper then retrieves the suture from the posterior portal (Figure 10f).

Figure 10d. Green sutures transferred from accessory to posterior portal with suture manipulating grasper

Figure 10e. Suture passed through cuff and retrieved with the tissue/suture grasper

Figure 10f. Suture retrieved with the suture manipulating grasper
Inserting the Second Anchor

The second anchor is inserted, again using the accessory anterior incision (Figure 11). Again, the anchor is rotated approximately 45 degrees so it is more under the articular surface and the anchor is inserted up to the first laser etch mark on the end of the inserter.

White Suture Passage

The white sutures are transferred with the Elite™ Suture Manipulating Grasper (Figure 12a).

The Arthro-Pierce™ Instrument then retrieves one white suture from the anterior portal, passing it through the tendon (Figures 12b and 12c).

The white suture is tied using the suture manipulating grasper through the preferred portal (Figure 12d).
Green Suture Passage

Next, the Arthro-Pierce™ Instrument penetrates the tissue and retrieves one green suture leg through the anterior portal (Figure 13a). The instrument is then removed and inserted into the posterior portal, penetrates the tissue and retrieves the second green suture leg (Figure 13b). Both sutures are brought into the preferred portal using the Elite™ Suture Manipulating Grasper.

The green suture is now ready to be tied (Figure 13c). The last knot is tied, and the suture is cut (Figure 13d).

Finally, the adequacy and stability of the repair is confirmed.

Rehabilitation

The goal of rehabilitation is to keep a full range of motion while protecting the repair for 6–8 weeks until the healing tissue is strong enough to begin active motion. A sling is worn for three weeks. Remove the arm from the sling several times daily to do passive elevation to 90 degrees and passive external rotation to 20 degrees. Active assistive motion is begun at 6–8 weeks and active motion at 8–10 weeks. Resistive exercises are not done until 12–16 weeks postoperatively. During this time passive exercises must be continued to avoid shoulder stiffness.
Hangman’s Knot

One of the first basic sliding knots used in arthroscopic surgery is the Hangman’s Knot.

1. Begin this knot by sliding the suture through the anchor eyelet so that one leg of suture has about 1/3 the length of suture and the second leg of suture is 2/3 the overall length of the suture. The shorter suture leg is the post leg. Pinch both legs of suture between the thumb and index finger. The post leg is colored blue for easy identification.

2. The non-post leg of suture is thrown over the top of the thumb and then looped around both suture legs four times. The wraps do not have to be tightly wrapped at this time.

3. Take the non-post leg of suture and thread through the loop created over the back of the thumb.

4. Use the non-post leg and begin to tighten the knot.

5. Slide the knot down to the tissue surface by pulling on the post suture leg. The knot will begin to tighten and form as it is pulled down.
6. The knot is locked into place by applying alternating half hitch knots, reversing the post leg with each half hitch thrown.

7. Alternate the post leg of the knot and tie a half hitch.

8. The Elite™ Knot Manipulator can be used to push and tighten down the knot.

9. The final alternated half hitch is created and pushed down to the knot surface.

10. The knot is finished by cutting the legs of the suture 3–5 mm from the knot surface. Be sure not to cut the suture to close to the knot surface, causing the knot to loosen.
Ordering Information

The complete Elite™ and Arthro-Pierce™ Systems for Arthroscopic Rotator Cuff Repair include:

**Elite™ Gold Shoulder System**  
**REF 7209143**

**Graspers**

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**Miscellaneous**

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**Arthro-Pierce™ Instrument System**  
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Additional Instruction

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

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