Endoscopic Tendon Sheath Release for Trigger Finger
In conjunction with Yasushi Nakao, M.D., Smith & Nephew has developed an endoscopic approach to “Flexor Tendon Sheath Release” for triggering and stiffness of fingers/thumb due to stenosing tenosynovitis. This minimally invasive approach is designed to maximize patient outcomes while incorporating the maximum safety element of releasing the A1 Pulley under direct endoscopic visualization. The system and technique combine to minimize patient risk commonly associated with conventional “Open” or “Blind Percutaneous” techniques.

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**Introduction**

Triggering and stiffness of fingers/thumb are common symptoms of tenosynovitis affecting the digital flexor tendon. In the morning, these phenomena are more apparent and hand function is significantly obstructed. In the advanced condition, patients show difficulty completing flexion or extension of digits and experience painful contracture at the PIP joints. Operative treatment is generally performed via a 2.0–2.5 cm palmar incision and involves resection of the A1 pulley and proliferated synovial sheath. Although this conventional open release of the flexor tendon is considered a safe and reliable procedure, postoperative discomfort due to scar tenderness and delayed wound healing has been reported. The procedure of endoscopic release of the flexor tendon was designed for triggering and stiffness of fingers/thumb as a minimally invasive surgery to achieve rapid return to daily activity.

It is well known that triggering and stiffness of fingers/thumb frequently occurs in patients with diabetes mellitus, especially in a multiple manner. In addition, delayed wound healing, infection, and hypertrophic postoperative scarring are common complications in a patient with diabetes mellitus. Taken together, the endoscopic tendon sheath release appears to be an appropriate alternative in diabetic patients or for multiple trigger fingers.

**Procedure**

**Surgery for Fingers**

**Step 1: Incision Location**

Preoperative palpation should be performed to determine accurate outline of flexor tendons and location of A1 pulleys. Make two transverse incisions on the flexor tendon, 2.5 mm in length, for each finger (Figure 1). Proximal incisions (1 cm proximal and 1 cm distal to the A1 pulley) should be carefully positioned since flexor tendons converge at the proximal palm. Distal incisions are located on the palmar digital crease at the center of the fingers.

**Step 2: Positioning and Subcutaneous Tissue Release**

Surgery is performed using a pneumatic tourniquet under local anesthesia or wrist block, and fingers are positioned in a hyperextended manner at the MP joints. After incisions are made, separation of the flexor tendon and subcutaneous tissue is performed using curved, blunt dissector (Figure 2).
Endoscopic Tendon Sheath Release for Trigger Finger

**Step 3: Cannula Placement**

The window cannula assembly is inserted subcutaneously along the flexor tendon from the proximal portal and advanced until it passes through the distal portal (Figure 3). The obturator is then removed.

*Note: Hand size will dictate the use of either the short or long cannula assembly.*

**Step 4: Endoscopic Visualization**

A 2.7 mm, 30° Light Post Opposite Endoscope is passed into the proximal portal to confirm the extent of stenosed A1 pulley and proliferative synovia, and to examine the anatomy through the cannula window (Figure 4). A probe can be used to palpate tissue, confirm anatomical structures, and pinpoint the proximal edge of the A1 pulley. Cotton-tipped applicators can be used to clear the operative site and to wipe the endoscope lens.

*Note: If marked proliferative tenosynovitis interferes with clear visualization of the A1 pulley, go back to Step 2 and separate the synovia from the A1 pulley using a curved, blunt dissector.*
**Step 5: Release**

A retrograde knife (Figure 5a) is inserted into the operative site from the distal portal. The proximal edge of the A1 pulley is hooked, and the entire length is sectioned under direct endoscopic vision (Figure 5).

After completion of the A1 pulley release, the synovial sheath may be released if the flexor tendon is longitudinally covered with synovium. A triangle knife (Figure 5b) is useful for incising the synovial sheath.

After release is performed, the cut edges of the A1 pulley fall away, and the underlying flexor tendon is visualized (Figure 6).

**Step 6: Postoperative Confirmation**

Complete release is confirmed as smooth sliding of the flexor tendon is viewed through the cannula window in passive movement of the fingers by the surgeon (Figure 7).

Remove the scope and reinsert an obturator. The cannula assembly is then removed.

Finally, the patient should move his or her fingers to confirm the absence of triggering.
Surgery for Thumbs

Step 1: Incision Location
Palpate the A1 pulley to accurately confirm its location and mark two incisions (Figure 8). Thumb portal locations are more distal compared to those in the fingers. The distal incision is located midpoint between the IP joint and the MP joint. The proximal incision should be carefully placed since the flexor pollicis longus is difficult to palpate in the palm.

Note: For the proximal incision, the thumb should be in full abduction.

Steps 2 and 3
Refer to Steps 2 and 3 in the Surgery for Fingers Section

Step 4: Endoscopic Visualization
An endoscope is passed into the proximal portal to confirm the extent of stenosed A1 pulley and proliferative synovia and to examine the anatomy through the cannula window (Figure 9). A probe can be used to palpate tissue, confirm anatomical structures, and pinpoint the proximal edge of the A1 pulley. Cotton-tipped applicators can be used to clear the operative site and to wipe the endoscope lens.

Note: If marked proliferative tenosynovitis interferes with clear visualization of the A1 pulley, go back to Step 2 and separate the synovia from the A1 pulley using a curved, blunt dissector.
**Step 5: Release**

The thumb procedure is performed in full abduction to avoid digital nerve injury.

In the thumb, it is common for a gap to exist between the cannula window and the A1 pulley (Figure 10a). The assistant should compress the cannula against the flexor tendon so that no gap exists (Figure 10b).

*Note: Marked proliferative tenosynovitis is common in the thumb. Use a curved, blunt dissector and probe to reveal the proximal edge of the A1 pulley. If access to the A1 pulley is difficult, change your approach to a conventional open technique.*

**Step 6**

Refer to Step 6 in the *Surgery for Fingers* Section

**Postoperative Care**

No suture is necessary for the incisions; a small compression dressing is applied. Patients are allowed to return to their daily activities within the limits of the dressing. The dressing is generally removed five to seven days after surgery and patients are allowed to immerse their hand in water.
## Ordering Information

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<tr>
<td>7207698</td>
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<tr>
<td>7207697</td>
<td>Dissector, Blunt Curved</td>
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<td>7207689</td>
<td>Cannula, Operative, 2.9 mm, short window</td>
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<tr>
<td>7207741</td>
<td>Cannula, Operative, 2.9 mm, long window</td>
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<td>3807</td>
<td>Obturator, Conical, 2.9 mm, short</td>
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<td>7207721</td>
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<td>Probe, 2.2 mm</td>
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<td>7207696</td>
<td>Trigger Finger Sterilization Tray</td>
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### Single Use Items

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<td>7207693</td>
<td>Trigger Finger Triangle Knife, pumpkin, sterile, box of 6</td>
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<td>7207730</td>
<td>Cotton-Tipped Applicators, sterile, 20 pkgs. of 5 each</td>
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### Arthroscopes

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<td>3768</td>
<td>30° Light Post Opposite, 2.7 mm, 35 mm focal length, videoarthroscope</td>
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<td>7205682</td>
<td>30° Light Post Opposite, 2.7 mm, direct-view arthroscope, autoclavable</td>
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<td>3947</td>
<td>30° Light Post Opposite, 2.7 mm, direct-view arthroscope, non-autoclavable</td>
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*MTO: This item can be purchased on a “Made to Order” basis.*
Additional Instruction
Prior to performing this technique, consult the Instruction for Use documentation provided with individual components — including indications, contraindications, warnings, cautions, and instructions.

Courtesy of Smith & Nephew, Inc., Endoscopy Division

Caution: U.S. Federal law restricts this device to sale by or on the order of a physician.