

SmartRelease[®]

Endoscopic Trigger Finger



MICROAIRE

Endoscopic Trigger Finger Release Surgical Technique

Table of Contents

Instrumentation	3
Troubleshooting Guide for Endoscope Fogging	4
System Description and Pre-Operative Technique . . .	5
Operative Technique - Finger	6
Operative Technique - Thumb	9



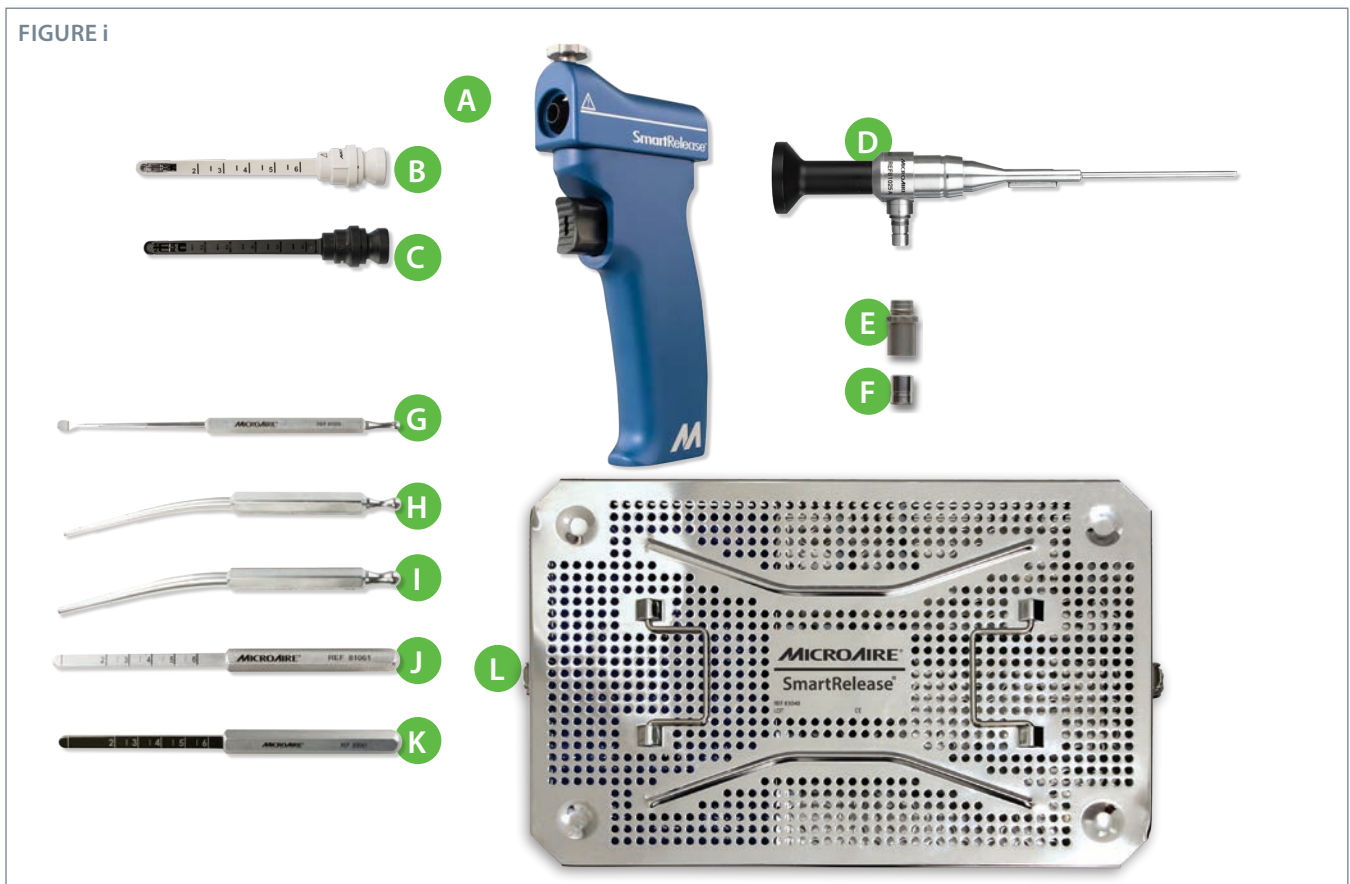
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Instrumentation

SmartRelease® Instruments and Accessories

A	SmartRelease Aluminum Handpiece	REF 83014
B	Disposable Standard Blade Assembly	REF 81010-1 or 81010-6
C	Disposable Onyx™ Blade Assembly	REF 83030-1 or 83030-6
D	2.9mm Eyepiece Autoclavable Endoscope	REF 81025
E	Endoscope Light Post Adapter, Storz®/Olympus®	REF 81151
F	Endoscope Light Post Adapter, Wolf®/Dyonics®	REF 81152
G	Elevator	REF 81029
H	Dilator – Small	REF 81026
I	Dilator – Medium	REF 81027
J	Dilator – Coequal to Standard Blade Assembly	REF 81061
K	Dilator - Coequal to Onyx™ Blade Assembly	REF 83061
L	Instrument Sterilization Tray	REF 83040

FIGURE i



For additional information, consult the MicroAire Instructions for Use (REF: IM-STRELEASE)

Troubleshooting Guide for Endoscope Fogging

In order to quickly identify the source of the fogging problem and formulate the appropriate solution, you should:

1. Assemble the system before the surgeon makes the skin incision to start the procedure.
2. Turn on the camera, light source and monitor. White balance using a white sponge and then lay a blue or green towel on the window using the fabric of the towel to set the light intensity and to focus on the mid and distant portion of the window.
3. Observe for any sign of fogging.

Condition	Cause	Solution	Prevention
Fogging— before insertion into surgical site	Moisture inside camera coupler and endoscope lens interface. A single drop of moisture can cause fogging at this juncture.	Disassemble and thoroughly dry endoscope lens and camera coupler interface with alcohol or anti-fog agent and sterile cotton swab.	Pre-warm system by connecting light source and camera before surgeon makes the skin incision. Use anti-fog agent to dry before assembly. Thoroughly dry endoscope lens and camera coupler interface with cotton swab before assembly.
	Moisture trapped within endoscope between endoscope lens optics and endoscope eyepiece.	Return to MicroAire Repair Center for repair.	Protect endoscope in its autoclave case during processing or when not in use.
Fogging— after insertion into surgical site	Condensation due to temperature difference between endoscope, SmartRelease handpiece and patient's tissue.	Attempt to warm endoscope to patient's tissue temperature: 1. Keep device inside tunnel until endoscope warms to body temperature, approximately 45 seconds. 2. Dip or wipe endoscope tip in sterile anti-fog agent and wipe dry.	Pre-warm system by connecting light source and camera before surgeon makes the skin incision. For the Eyepiece Endoscope: If there is sufficient time between processing and the skin incision, allow endoscope to air dry in its autoclave case between procedures.
	Moisture inside camera coupler and endoscope lens interface. A single drop of moisture can cause fogging at this juncture.	Disassemble and thoroughly dry endoscope lens and camera coupler interface with alcohol or anti-fog agent and sterile cotton swab.	For back-to-back cases without sufficient time between processing and the skin incision, place the SmartRelease handpiece and instruments into pan of sterile room temperature water/saline immediately following autoclaving.
	Excess fluid inside surgical site.	Soak up fluid with sterile cotton swab.	Avoid injecting anesthetics into the surgical site. Be sure endoscope is completely dry after processing.
Fuzzy or no picture	Moisture trapped within endoscope between endoscope lens optics and endoscope eyepiece.	Return to MicroAire Repair Center for repair.	Protect endoscope in its autoclave case during processing or when not in use.
	Damaged endoscope.	Return to MicroAire Repair Center for repair.	Protect endoscope in its autoclave case during processing or when not in use.

For additional information, consult the MicroAire Instructions for Use (REF: IM-STRELEASE)

System Description and Indications for Use

The MicroAire SmartRelease Endoscopic Soft Tissue Release System is comprised of an endoscope and a handpiece that holds a Disposable Blade assembly. The trigger finger device attaches to any standard video camera and light source used in endoscopic procedures. The surgeon introduces the disposable blade assembly into the finger through a 1-cm incision in the flexion crease of the affected finger. Viewing the roof of the A1 Pulley through a window at the tip of the instrument, the surgeon elevates the blade to cut the pulley as the instrument is withdrawn.

The MicroAire SmartRelease Endoscopic Soft Tissue Release System is indicated for trigger finger release in the hand.

The MicroAire Endoscopic Soft Tissue Release System is not intended for use in patients with known abnormalities of the hand (Trigger Finger), including flexor synovitis, Dupuytren's contracture, active infection digits, or anatomical anomalies.

System Warnings and Cautions

- **Warning:** Used to indicate that the safety of the patient and/or hospital personnel could be involved.
- **Caution:** Used to point out special procedures or precautions that must be followed to avoid damaging the system instrumentation.
- **Note:** Used to point out the easiest means of carrying out a technique.

Warnings:

- Do not use the disposable blade assembly if the sterile packaging is open or damaged.
- If the blade fails to retract while inside the surgical site, keep it in-situ and release the locking screw to separate the assembly from the handpiece. If the blade remains extended, keep it in place and convert to an open procedure.
- Failure to lock the blade assembly in place may cause separation from the handpiece and may injure the patient or damage the instrument.
- Do not over-tighten the locking screw on the handpiece; this may result in non-retraction of the blade and may injure the patient.
- Do not dissect tissue unless visualization is clear and unobstructed.
- The blade is sharp.
- Do not use the system without properly attaching the light cable.
- Reusing the disposable blade assembly may result in patient infection due to inadequate cleaning or sterilization.

Cautions:

- Reusable components must be cleaned and sterilized before every use, including first use.
- Small-diameter endoscopes are fragile.
- Do not handle the endoscope at the distal end. Grasp the camera mount end only.
- Do not place other items on top of the endoscope.

Pre-Operative Technique

The surgical suite should be set up to offer the surgeon the best view of the video monitor. The surgeon should be able to easily shift his/her view upward from the surgical field to the video image.

The patient is positioned supine, with the arm abducted 75-80 degrees. Begin with the patient's hand positioned palm up on a hand table equidistant between the surgical assistant and the surgeon.

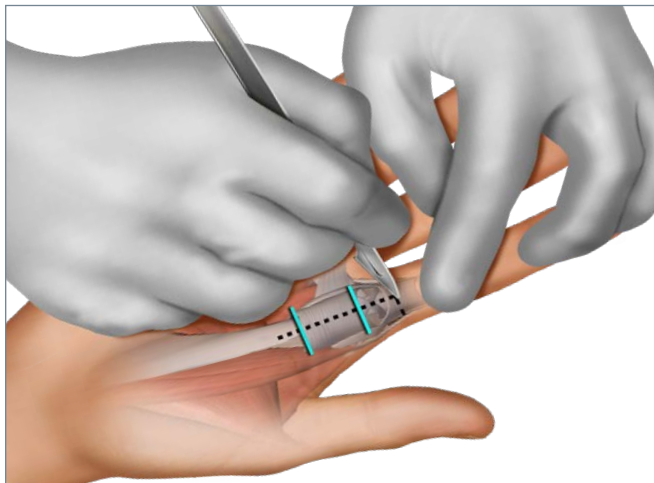
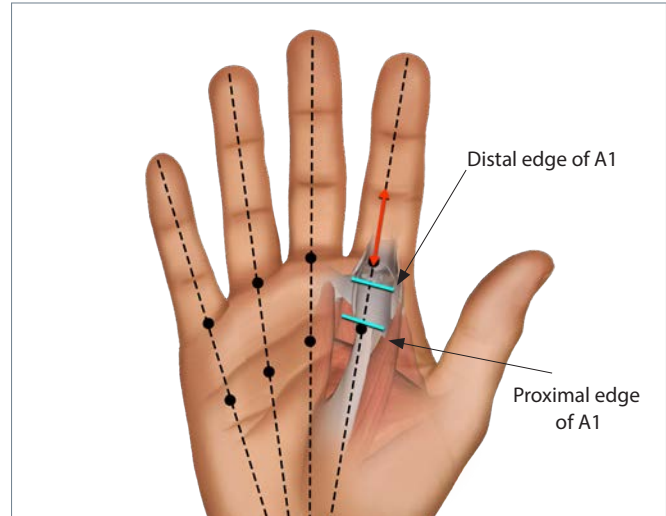
The procedure can be done with the preferred anesthetic (General, MAC, Local or Regional Anesthesia) of the surgeon.

In the surgical suite—before the patient is brought into surgery with the intention of performing the procedure endoscopically—the SmartRelease system should be fully assembled and checked for correct operation, which includes blade elevation and retraction and a clear video image. The equipment, including the instruments and the video monitor, should be positioned relative to the operating table and surgeon's position after the extremity is prepped and draped.

Operative Technique - Finger

STEP 1 · Marking of Landmarks

- Mark the palmar digital crease of the affected digit.
- Palpate the tendon and mark a dotted line along the tendon trajectory proximally
- Measure the distance from the palmar digital crease to the proximal interphalangeal (PIP) joint flexion crease
- Then, measure that same distance from the palmar digital crease proximally along the axis of the tendon to determine the approximate proximal edge of the A1 pulley.
- Mark the proximal edge of the A1 Pulley
- Measure and mark 1 cm distal to the proximal edge identified as the approximate distal edge of the A1 Pulley



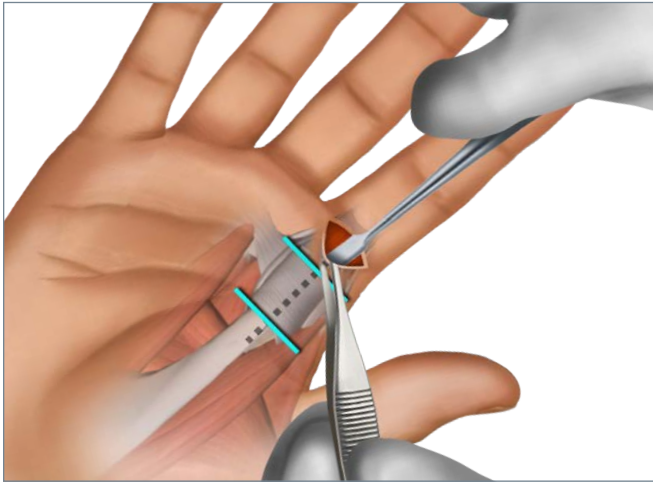
STEP 2 · Making the Incision

Make a 1 cm wide transverse incision at the proximal palmar digital crease of the affected digit.



STEP 3 · Making the Incision, Continued

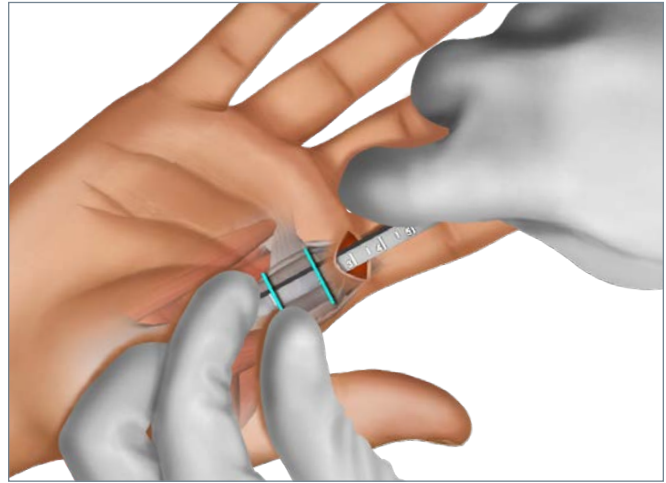
Use blunt tenotomy scissors and forceps to elevate the subcutaneous tissue above the underlying tendon sheath.



STEP 4 · Preparing Path for Instrument

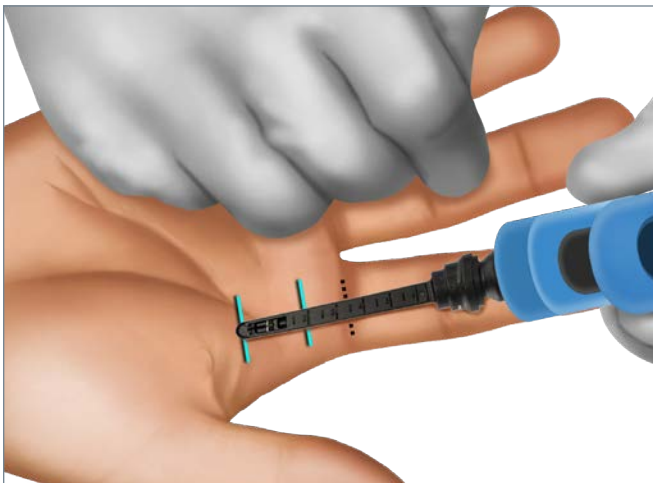
Elevate the subcutaneous tissue from the underlying tendon sheath and create a passage proximally into the palm. The passage created should extend until just above the proximal end of the A1 pulley to allow for easy insertion of the blade assembly. Use the elevator to feel along the tendon sheath and clear any remaining fibers that may be adherent to the tendon sheath.

Note: The septa of Legueu and Juvara attach to the transverse ligament of the palmar aponeurosis superficially and to the soft-tissue confluence deeper and distally. These septa are often encountered and can be bluntly separated by inserting and opening a straight hemostat volar (superficial) to the A-1 pulley and flexor tendon sheath.



STEP 5 · Preparing Path for Instrument, Continued

Insert the coequal dilator (superficial to the tendon sheath) along the path of the tendon to verify that adequate space has been created for the blade assembly.



STEP 6 · Preparing a Path for the Instrument, Continued

Blade extension and retraction should be checked before insertion into the patient's hand.

Prior to flipping the hand palm down, take the complete blade assembly and place the distal tip of the disposable blade at your landmark for the proximal edge of the A1 Pulley.

Then take note of where the tip of the affected finger lays on the handpiece. This landmark can be used as a reference once the hand is turned over to confirm that the blade assembly has been inserted far enough to reach the proximal edge of the A1 pulley.



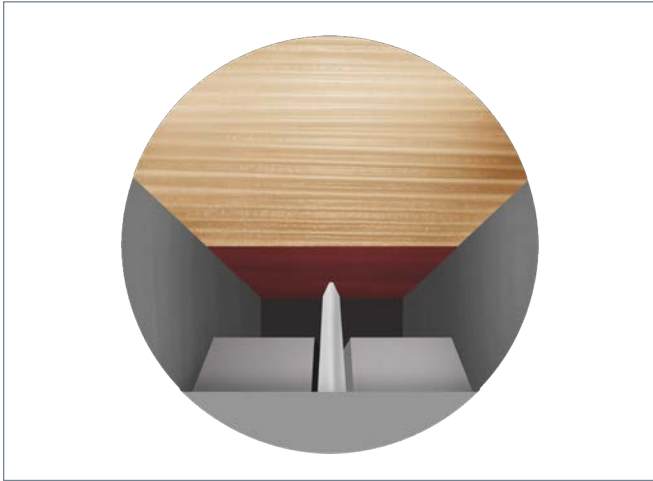
STEP 7 · Introduce the Blade Assembly

Rotate the patient's hand with the palm facing the table. While holding the patient's hand in slight extension, insert the blade assembly into the space with the viewing window facing up towards the pulley.

Ensure that the blade assembly is aiming along the tendon trajectory markings:

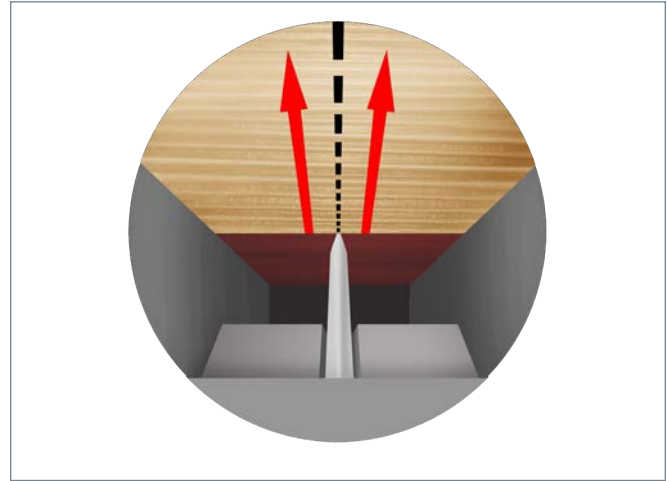
- Maintain alignment of the blade assembly with the finger
- Check your landmarks for the A1 Pulley
- Visually verify on the screen that the blade assembly is centered over the tendon sheath

Use the non-operative hand to help maintain centralization of the blade assembly over the tendon sheath



STEP 8 · Define the Proximal End of the A1 Pulley

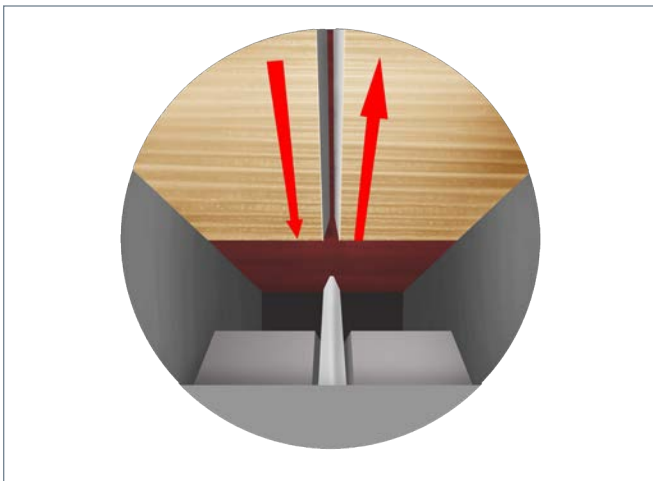
Use a sufficient number of distal to proximal passes to accurately define the edges of the A1 Pulley, ensure that there is a clear view of the pulley, and that no at-risk structures are in the path of the blade assembly.



STEP 9 · Incising the A1 Pulley

Elevate the blade to engage the proximal edge of the pulley and release the A1 pulley from the proximal to the distal edge by slowly withdrawing the handpiece in a distal direction.

Warning: Elevation of the blade's full length should be done with caution to avoid contacting the tendon, deep to the A1 pulley, when possible.



STEP 10 · Inspecting Incised Pulley

Release the trigger to retract the blade. Reinsert the blade assembly to inspect the completeness of the pulley division.

If the patient is awake, confirm complete release by asking the patient to flex and extend the finger while applying gentle pressure over the A1 pulley. Finger movement should be smooth without any noticeable triggering.

STEP 11 · Closing and Dressing the Wound

Use sutures to close the incision. Following wound closure, apply dressing.

Operative Technique - Thumb

STEP 1 • Marking of Landmarks

Mark the (1) interphalangeal crease (2) metacarpophalangeal joint crease (3) halfway between the interphalangeal crease and the metacarpophalangeal joint crease of the affected thumb.

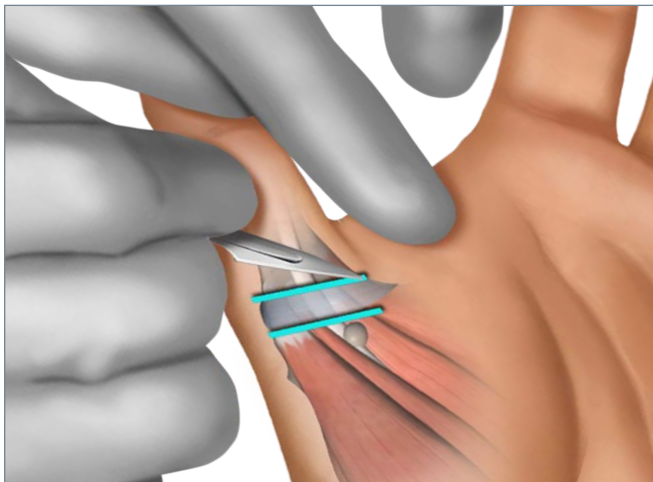
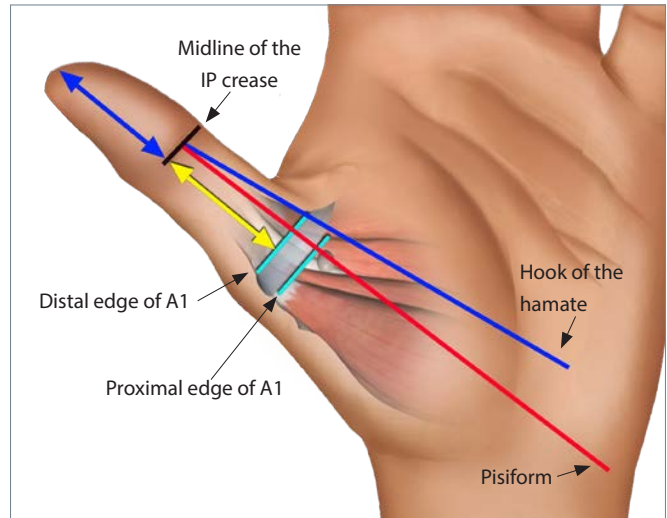
Palpate the tendon and mark a dotted line along the tendon trajectory proximally.

Measure the distance from the marked interphalangeal crease to tip of the thumb.

Then measure that same distance from marked interphalangeal crease proximally to determine the approximate proximal edge of the A1 Pulley.

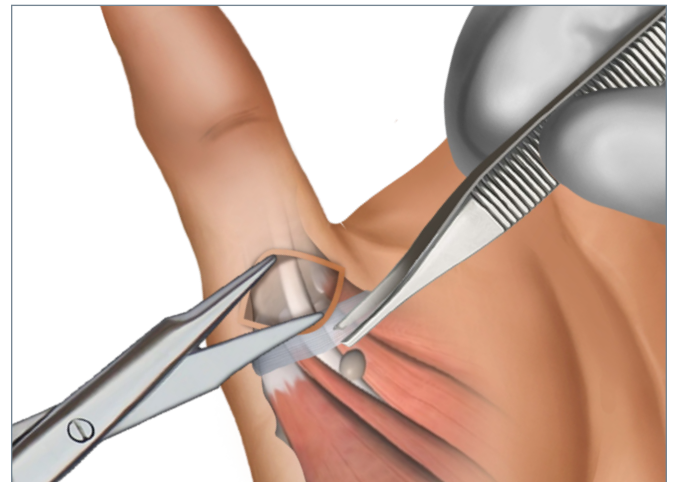
Mark the proximal edge of the A1 Pulley.

Measure and mark 0.5 cm distal to the proximal edge identified as the approximate distal edge of the A1 Pulley.



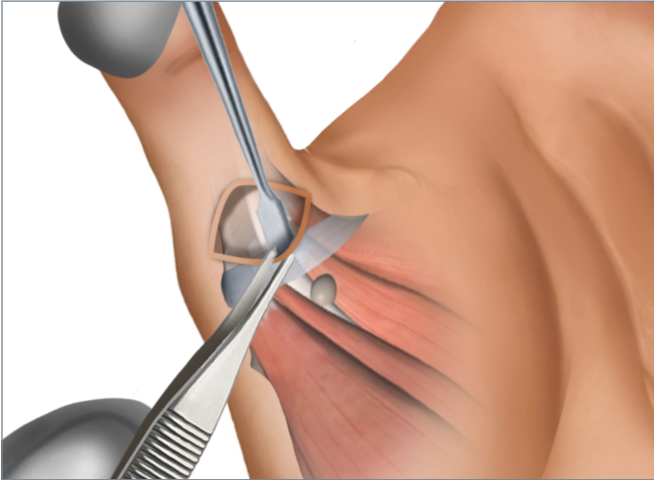
STEP 2 • Making the Incision

Make a 1 cm wide transverse incision at the mark halfway between the interphalangeal crease and the metacarpophalangeal joint crease of the affected thumb.



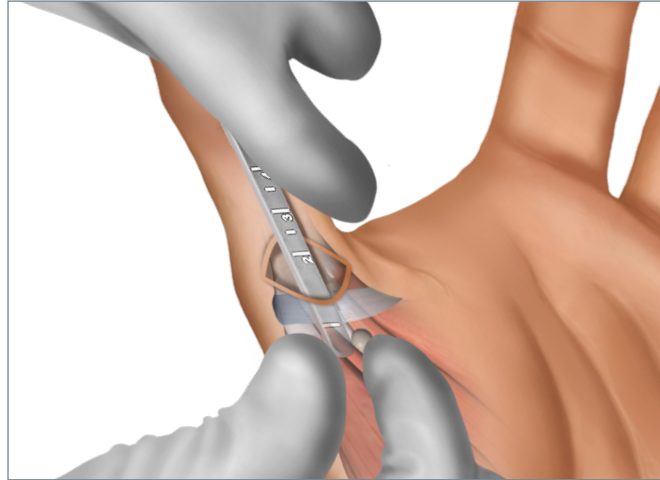
STEP 3 • Making the Incision, Continued

Use blunt tenotomy scissors and forceps to elevate the subcutaneous tissue above the underlying tendon sheath.



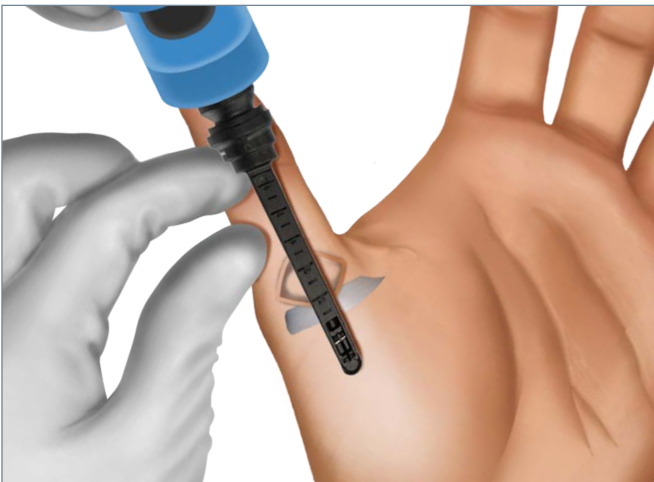
STEP 4 · Preparing Path for Instrument

Elevate the subcutaneous tissue from the underlying tendon sheath and create a passage proximally into the thumb until just above the proximal end of the A1 pulley. Use the elevator to feel along the tendon sheath and clear any remaining fibers that may be adherent to the tendon sheath.



STEP 5 · Preparing Path for Instrument, Continued

Insert the coequal dilator (superficial to the tendon sheath) along the path of the tendon to verify that adequate space has been created for the blade assembly.



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Blade extension and retraction should be checked before insertion into the patient's hand.

Prior to flipping the hand palm down, take the complete blade assembly and place the distal tip of the disposable blade at your landmark for the proximal edge of the A1 Pulley.

Then take note of where the tip of the affected thumb lays on the handpiece. This landmark can be used as a reference once the hand is turned over to confirm that the blade assembly has been inserted far enough to reach the proximal edge of the A1 pulley.

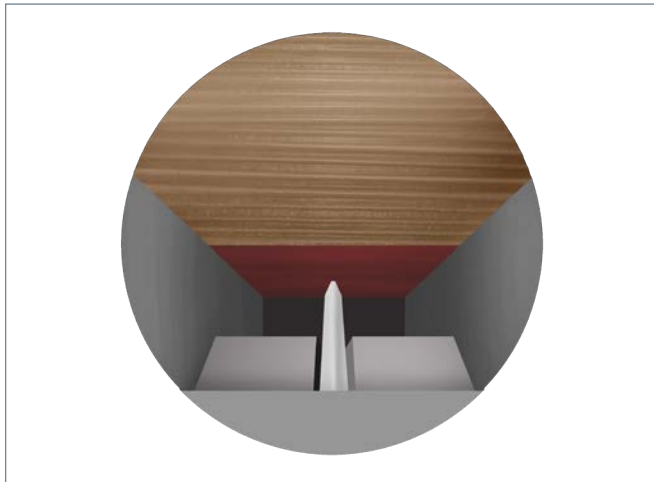


STEP 7 · Introduce the Blade Assembly

Rotate the patient's hand with the palm facing the table. While holding the patient's hand in slight extension, insert the blade assembly into the space with the viewing window facing up towards the pulley. Ensure that the blade assembly is aiming along the tendon trajectory markings:

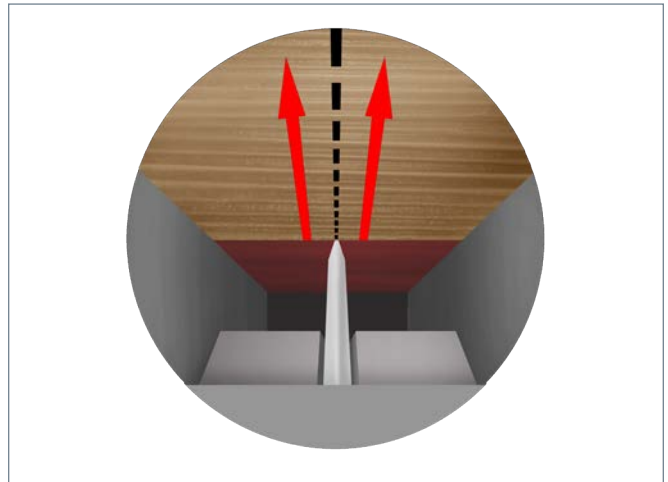
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STEP 8 · Define the Proximal End of the A1 Pulley

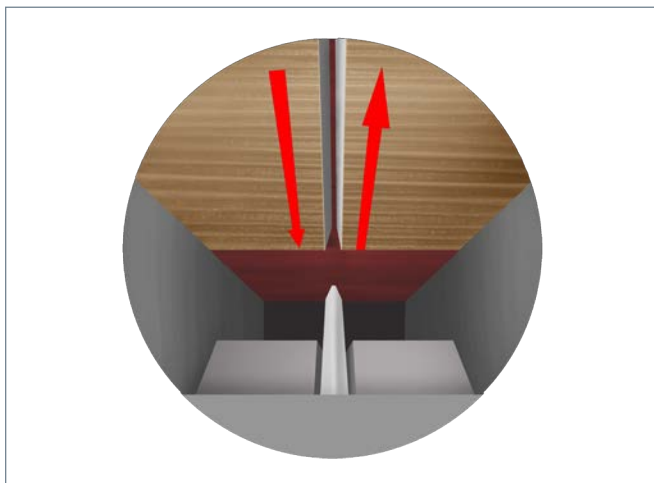
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Release the trigger to retract the blade. Reinsert the blade assembly to inspect the completeness of the pulley division.

If the patient is awake, confirm complete release by asking the patient to flex and extend the thumb while applying gentle pressure over the A1 pulley. Thumb movement should be smooth without any noticeable triggering.

STEP 11 · Closing and Dressing the Wound

Use sutures to close the incision. Following wound closure, apply dressing.

SmartRelease® Ordering Information

System Components

83014	SmartRelease® Aluminum Handpiece
81025	2.9mm Eyepiece Autoclavable Endoscope
81026	Dilator - Small
81027	Dilator - Medium
81029	Elevator
81061	Coequal to Standard Blade Assembly
83061	Coequal to Onyx™ Blade Assembly
83040	Instrument Sterilization Tray

Disposable Blades

81010-1	Disposable Standard Blade Assembly (Single Pack)
81010-6	Disposable Standard Blade Assembly (Six Pack)
83030-1	Disposable Onyx™ Blade Assembly (Single Pack)
83030-6	Disposable Onyx™ Blade Assembly (Six Pack)

Parts & Accessories

81151	Endoscope Light Post Adapter, Storz®/Olympus® fitting
81152	Endoscope Light Post Adapter, Wolf®/Dyonics® fitting

Refurbished Endoscopes*

81025A	Refurbished 2.9mm Eyepiece Autoclavable Endoscope
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* Refurbished endoscopes are sold only with a core scope exchange.

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Olympus® Registered Trademark of Olympus America Inc.
Wolf® Registered Trademark of Richard Wolf Medical Instruments Corporation
Dyonics® Registered Trademark of Smith & Nephew

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MICROAIRE®

MicroAire Surgical Instruments

3590 Grand Forks Boulevard
Charlottesville, VA 22911 USA
800 722 0822 or +434 975 8000
www.microaire.com

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