

# SmartRelease®

## Endoscopic Plantar Fascia Release



**MICROAIRE®**  
*For Surgery. For Life.™*

Endoscopic Plantar Fascia Release Surgical Technique

**NOTE:** The SmartRelease® Lower Extremity System is not yet CE approved.

## Introduction

This Surgical Technique is provided as an educational tool and clinical aid to assist medical professionals in the proper protocol for the MicroAire® SmartRelease® endoscopic plantar fascia release instrumentation. For effective use, surgeons must possess a thorough knowledge and understanding of foot anatomy and the endoscopic technique using the MicroAire® SmartRelease® system. Instructional videos and cadaver workshops are available through MicroAire Surgical Instruments.

Those considering using the MicroAire® SmartRelease® system should only do so after successfully completing MicroAire's required surgical training as well as the relevant training mandated in the professional guidelines of any pertinent hospital, institution or society. For training dates and locations, visit [www.microaire.com](http://www.microaire.com).

Failure to follow the Surgical Technique may result in permanent injury to the patient. If, while performing this technique, any problems should arise, such as anatomical anomalies, inadequate visualization, inability to identify anatomy or questions concerning technique or instrumentation, the surgeon should abandon the endoscopic plantar fascia release and convert to another plantar fasciotomy procedure.

These pages are not intended to provide medical advice or physician instruction on the appropriate use of products produced or supplied by MicroAire Surgical Instruments, its affiliates, related companies, or its licensors or other partners.

**NOTE:** The MicroAire® SmartRelease® system uses a dry procedure. No fluid or gas should be introduced into the surgical site during this procedure.

## System Description and Intended Use

### Intended Use

The MicroAire® SmartRelease® Endoscopic Soft Tissue Release System is comprised of an endoscope and a handpiece that holds a disposable blade assembly. The plantar fascia device attaches to any standard video camera and light source used in endoscopic/arthroscopic procedures. The surgeon introduces the disposable blade assembly into the medial skin incision portal. Viewing of the plantar fascia through a window at the tip of the instrument, the surgeon elevates the blade to cut the fascia as the instrument is withdrawn.

### Contraindications

The MicroAire® SmartRelease Endoscopic Plantar Fascia Release System is not intended for use in patients with severe or significant abnormalities of the foot, including patients with congenital anatomical abnormalities, blood supply limitations and previous infections that may retard healing.

### Warnings

The surgeon is specifically advised not to use the instrument to explore and/or treat any structure other than the plantar fascia. Failure to heed this warning can lead to damage of the surrounding tissues and structures.

If the surgeon is unable to clearly visualize the plantar fascia with definite medial and lateral edges, the blade assembly should be withdrawn and the procedure should be converted to another plantar fascia release procedure.

If the surgeon has any questions or concerns regarding patient anatomy, the surgical approach or the instrument function — or if the view is any less than adequate — the instrument should be withdrawn and the procedure converted to another plantar fascia release procedure.

Failure to follow the proper training and surgical technique can result in permanent injury to the patient. Endoscopic release of the plantar fascia using the MicroAire® SmartRelease® system should not be attempted until the surgeon has been trained at a MicroAire-sponsored workshop. This training requires thorough familiarity with this Surgical Technique, the Instructions for Use and gaining hands-on experience with a trained surgeon who is experienced with the device. The procedure should be performed on cadaveric specimens before initial use. Operating room staff should thoroughly review the MicroAire® SmartRelease® Instructions for Use prior to set up of this system.

### Definitions

**NOTE:** Indicates the easiest means of carrying out techniques.

**CAUTION:** Indicates special procedures or precautions that must be followed to avoid damaging the system instrumentation.

**WARNING:** Indicates that the safety of the patient and hospital personnel could be involved.

*Review full list of Notes, Cautions, and Warnings in the Instructions for Use (IM-EPFR-EGR).*

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# Instrumentation

## SmartRelease® Instruments and Accessories

<b>A</b>	SmartRelease® Aluminum Handpiece	REF 85014
<b>B</b>	Disposable Standard Blade Assembly	REF 84040-1 or 84040-6
<b>C</b>	Disposable Onyx™ Blade Assembly	REF 85050-1 or 85050-6
<b>D</b>	2.9mm Eyepiece Autoclavable Endoscope	REF 81025
<b>E</b>	Endoscope Light Post Adapter, Storz®/Olympus®	REF 81151
<b>F</b>	Endoscope Light Post Adapter, Wolf®/Dyonics®	REF 81152
<b>G</b>	Elevator	REF 85029
<b>H</b>	Dilator — Small	REF 85026
<b>I</b>	Dilator — Medium	REF 85027
<b>J</b>	Dilator — Coequal to Standard Blade Assembly	REF 84061
<b>K</b>	Dilator — Coequal to Onyx™ Blade Assembly	REF 85061
<b>L</b>	Instrument Sterilization Tray	REF 85040

FIGURE i



For additional information, consult the MicroAir Instructions for Use (REF: IM-EPFR-EGR)

# 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 both the mid and distal portion of the window.
3. Observe for any signs of fogging.

**NOTE:** Beware of contamination caused by disassembling the camera and the endoscope in the sterile field.

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 and 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 patient until endoscope warms up 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 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 with out 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 autoclavable case during processing or when not in use.
	Damaged endoscope.	Return scope 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-EPFR-EGR)

# Surgical Setup

Two physical considerations dictate the best surgical setup: the surgeon's orientation with respect to the video monitor and the patient's operative foot. 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 gaze upward from the surgical field to the video image.

The patient is positioned supine on the operating room table with the operative heel hanging off the end of the operating table. A well-padded tourniquet should be used for this procedure. Standard skin preparation should be performed. Sterile draping should leave the lower leg, ankle, and foot fully exposed. The foot and leg should be fully exsanguinated, excessive bleeding could distort image and any venous blood trapped distal to the tourniquet will cause a locally anesthetized patient premature pain.

The surgeon's hand, when holding the instrument, should naturally align the blade assembly so that it points from the medial side of the foot to the lateral side of the foot, perpendicular to the plantar fascia. Adjusting the blade location so the blade protrudes from the top or bottom of the device may prove useful in conserving the device's natural lateral-grip use. The surgeon should stand on the medial side of the foot as the medial portion of the plantar fascia ligament is being released.

To conduct an endoscopic plantar fascia release using the MicroAire® SmartRelease® system, the sterile field should include:

- 1 pair of tenotomy scissors
  - 1 sterile skin marking pen
  - 1 scalpel, #15 blade
  - 2 Ragnell right angle retractors
  - 2 Senn rake retractors
  - 1 dilator — small\*
  - 1 dilator — medium\*
  - 1 dilator — coequal to blade assembly\*
  - 1 elevator\*
- \*(Included with MicroAire® SmartRelease®)

Before exsanguination and elevation of the tourniquet, it is recommended that the surgeon mark key anatomical landmarks on the patient's foot using a sterile skin marking pen: the calcaneal tubercle, and the medial and lateral edges of the plantar fascia (if palpable).

The surgeon should take this time and also plan the incision mark, as described in Step 1 of the Surgical Technique.

## IMPORTANT

In the surgical suite—before the patient is brought into surgery with the intention of performing the procedure endoscopically—the MicroAire® 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

## ANESTHESIA

A general or regional anesthetic is strongly recommended and is dependent on adjunct procedures being performed. Local anesthetic increases tissue fluid, which can obscure endoscopic viewing and cause lens fogging. **Only when the surgeon has gained experience with the surgical approach and instrumentation should the procedure be performed using local anesthesia.**

When local anesthesia is used, the tourniquet is elevated and a volume of one percent lidocaine with epinephrine is injected subcutaneously near the incision site on the medial side of the foot. Use the least amount of local anesthesia possible. Avoid injecting the local anesthesia superficial to the plantar fascia as it will compromise the endoscopic view of the ligament. Local anesthesia may also be used to block the posterior tibial nerve.

## STEP 1

### Making the Incision on the Medial Side of the Foot

Palpate the medial calcaneal tuberosity with the thumb and feel the attachment site of the plantar fascia. Use a skin marker to place a mark (Placement Mark) one cm in front of the medial calcaneal tuberosity, on the plantar aspect of the foot. Place another mark around 2 cm medially from the plantar skin, in line with the Placement Mark (Incision Site). Make a 2 cm vertical skin incision centered on and perpendicular to the skin mark on the medial aspect of the foot. Use a spreading longitudinal dissection to expand the skin incision for other instrumentation. Only cut the cutaneous tissue at this step.

### NOTE

*This medial incision is usually in line with the posterior border of the distal tibia. A line can be dropped from this point to verify correct portal placement.*

### IMPORTANT

When beginning the local anesthesia, it is important that the patient receive minimal or no sedation. A sedated patient may move abruptly in response to discomfort when instrumentation is being introduced into the tunnel. Frequently, local anesthesia requires support with other anesthetic agents as prescribed by the anesthetist or surgeon.

To help minimize the opportunity for patient injury under local anesthesia, **it is very important that:**

- (1) The surgeon and assistant be prepared to manually restrain any sudden movements by the patient; and
- (2) The instruments (i.e. elevator, dilators, and blade assembly) should be inserted into the leg in a manner that will help avoid injury to tissues and structures in the foot should the patient move suddenly.



FIGURE 1

## STEP 2

### Creating the Path for the Instrument

Insert the dilators to expand the tissue gap, starting with the small dilator and ending with the coequal to the disposable blade assembly. Note the texture of the plantar fascia ligament. Push along the ligament on the superficial side to (a) create a larger path for the instrument and (b) attempt to displace some of the fat from the ligament surface.

#### NOTE

*It may help in finding the plantar fascia to dorsiflex the toes to increase the tension of the ligament.*

*This is a good point to take note of the insertion distance to fully cross the plantar fascia ligament. Observing the width of the ligament through palpation and on-instrument markers is useful at this step.*

*The width of the ligament can be noted by the ruler on the coequal dilator; find the measurement needed to cut the desired amount of the ligament and insert the blade assembly to that depth measurement when cutting the ligament.*

*Be sure to create a path on the superficial side of the plantar fascia. Surgically operating from this side may yield better results.<sup>1</sup>*

#### WARNING

The calcaneal nerve (Baxter's Nerve) is located near the recommended incision site. If encountered or visualized, the incision is too proximal.

FIGURE 2



## STEP 3

### Introducing the Blade Assembly

While manually dorsiflexing the toes, insert the blade assembly into the incision and path created in the previous steps. Locate the central band of the plantar fascia, and press the viewing window snugly against the ligament. Taking note of the medial and lateral edges of the ligament, plan to cut the central and medial band of the ligament.\*

#### NOTE

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

*Fat may prolapse into the field of view after proceeding past either the medial or lateral edges of the plantar fascia. This is normal, and may require removal and cleaning of the scope if the adipose tissue fully blocks the endoscopic view.*

#### WARNING

It is advised to not cut over 50% of the plantar fascia (medial, central, and lateral bands). Doing so may result in compromised structural integrity of the plantar foot and foot arch, will prolong recovery time, and may result in more complications.<sup>2</sup> Plan where to cut the ligament carefully.

\*If blade assembly viewing tip is obstructed due to soft tissue/fluid:

1. Remove the handpiece and blade assembly from the surgical site
2. Suction, forceps or sterile gauze can be used to remove excess soft tissue/fluid

FIGURE 3





## STEP 4

### Incising the Plantar Fascia

After confident in a clear endoscopic view of the ligament and a well-planned location to begin the incision of the central and medial bands of the ligament, press the blade assembly against the plantar fascia while manually dorsiflexing the patient's foot. Engage the trigger to raise the blade, cutting the plantar fascia from the lateral to medial direction. Maintain the pressure against the ligament and manual dorsiflexion while proceeding with the cut. Continue until the desired amount of ligament has been fully released, and the underlying muscle can be visualized endoscopically.

#### NOTE

*Multiple passes with the blade may be needed to fully release the desired amount of the plantar fascia.*

#### CAUTION

If adipose tissue prolapses into the field of view and completely compromises the view, lower the blade, remove the assembly, and clean the scope. Do not cut the ligament with a compromised field of view. Once the underlying muscle has been visualized, the release is complete. Do not cut into the muscle as this can cause excessive bleeding which can compromise the endoscopic view.

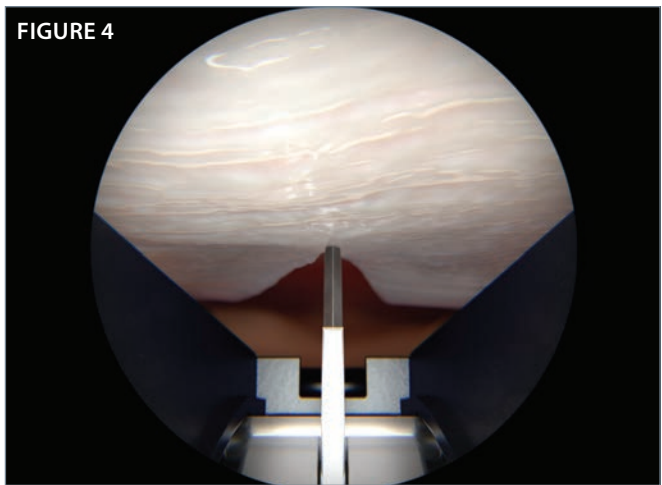
#### WARNING

It is advised to not cut over 50% of the plantar fascia (medial, central, and lateral bands). Doing so may result in compromised structural integrity of the plantar foot and foot arch, will prolong recovery time, and may result in more complications.<sup>2</sup>

Blade extension and retraction should be checked following assembly of the device and before use on the patient. When fully extended, the blade forms an approximate 80-degree angle to the flat surface of the blade assembly and measures approximately 3.5 mm in height. If the blade does not extend and retract properly during system checkout, the device should not be used.

#### **If the blade fails to retract after the trigger is released, follow these steps for safe removal:**

1. Release the blade lock screw while supporting the handpiece. Use the scope to view the blade to ensure blade retraction.
2. If the blade remains elevated, carefully separate the blade assembly from the hand piece, leaving the blade assembly in the foot of the patient. Use the endoscope to view the blade position as the handpiece is removed from the blade assembly. The blade assembly is left in the foot.
3. If the blade has not returned to a retracted position, do not remove the blade assembly from the foot through the endoscopic portal. Convert to an open procedure to remove the blade assembly. Inspect the blade assembly to make sure no parts are missing. If a part is missing, take an x-ray of the patient's foot.



## STEP 5

### Inspecting the Plantar Fascia

Fully retract the blade by releasing the trigger. Inspect the ligament division by reinserting the blade assembly. The assembly can be rotated with the blade retracted to fully inspect the cut. A "V" shaped cut should be noticed, since the ligament should not be fully incised. Assure that there are not remaining fibers within the "V" shaped portion of the cut and that the lateral portion of the plantar fascia is still intact.

### NOTE

*Once the blade assembly is removed, palpate the plantar fascia with and without dorsiflexing the foot. Reduced tension should be noticed.*

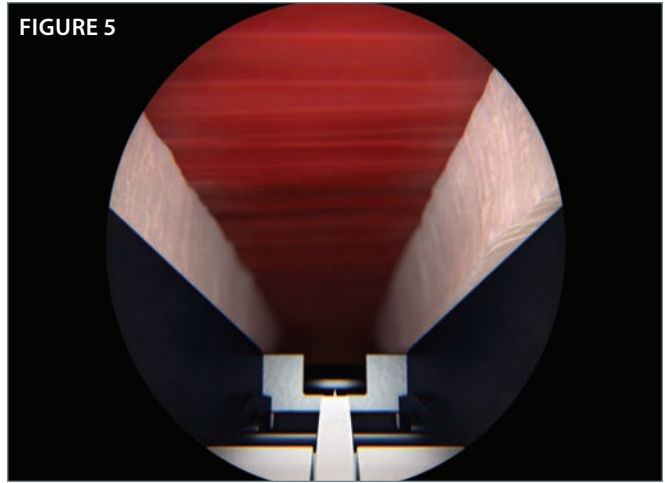
*A lateral band test can be performed by inserting the elevator into the surgical path medial to lateral and engaging the lateral band manually to ensure it is intact.*

## STEP 6

### Closing and Dressing the Wound

Use sutures to close the wound completely and dress the closed wound.

FIGURE 5





# SmartRelease® Ordering Information

## System Components

<b>85014</b>	SmartRelease® Aluminum Handpiece
<b>81025</b>	2.9mm Eyepiece Autoclavable Endoscope
<b>85026</b>	Dilator — Small
<b>85027</b>	Dilator — Medium
<b>85029</b>	Elevator
<b>84061</b>	Dilator— Coequal to Standard Blade Assembly
<b>85061</b>	Dilator— Coequal to Onyx™ Blade Assembly
<b>85040</b>	Instrument Sterilization Tray

## Disposable Blades

<b>84040-1</b>	Disposable Standard Blade Assembly (Single Pack)
<b>84040-6</b>	Disposable Standard Blade Assembly (Six Pack)
<b>85050-1</b>	Disposable Onyx™ Blade Assembly (Single Pack)
<b>85050-6</b>	Disposable Onyx™ Blade Assembly (Six Pack)

## Parts & Accessories

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

## Refurbished Endoscopes\*

<b>81025A</b>	Refurbished 2.9mm Eyepiece Autoclavable Endoscope
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\* Refurbished endoscopes are sold only with a core scope exchange.

1. Catal, B. et al. Endoscopic Plantar Fasciotomy; Deep Fascia I Versus Superficial Fascial Approach: A Prospective Randomized Study. Journal of Foot & Ankle Surgery. 2017; 56:1001-1008.
2. Brugh, AM et al. Lateral Column Symptomatology Following Plantar Fascial Release: A Prospective Study. Journal of Foot & Ankle Surgery. 2002; 41 (6):365- 371.

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