Heel pain from plantar fasciitis is a common complaint heard by physicians who treat foot and ankle pain. Patients with resistant heel pain from chronic plantar fasciitis are more commonly treated by surgical plantar fasciotomy than by long-term casting or extracorporeal shockwave therapy. Recently, percutaneous, endoscopic, and minimally invasive approaches to plantar fasciotomy have gained acceptance and popularity.

Although ultrasound-guided procedures have been described for various foot and ankle conditions, to my knowledge there are no previous studies of ultrasound-guided plantar fasciotomy. Standard sonographic views of the plantar fascia require placement of the transducer on the plantar aspect of the heel. Therefore, the plantar percutaneous fasciotomy techniques of Lane and London, White, Licopantis, and Brekke and Green may be difficult to adapt for ultrasound guidance.

Fortunately, the Weil medial percutaneous approach can be easily adapted for ultrasound guidance with minimal modification. Benton-Weil et al. reported that this approach met or exceeded expectations in 83% of their patients an average of 34 months postoperatively.

**Case Report**

A 48-year-old woman presented for surgical consultation. She noted persistent aching left heel pain for 9 months that she rated 8 on a 10-point visual analog scale. The pain was initially a tight first-step pain in the morning that later became more constant and severe. She was treated conservatively (icing, supportive shoes, stretching, foot orthoses, corticosteroid injections, and piroxicam) by another physician, without long-term relief. Radiographs of the patient’s left heel were negative for heel spurs. Preoperative diagnostic ultrasound study identified inflammation and thickening of the proximal plantar fascia, with no indications of a plantar fascia tear or rupture.

The patient elected to proceed with an ultrasound-guided percutaneous plantar fasciotomy, as described in the following section. Postoperatively, the patient was given acetaminophen with codeine for postoperative pain control and was instructed to remove her surgical dressings after 3 days. She was instructed to rest, elevate, and ice her foot for 1 week.

The patient was seen for follow-up 7 days after the procedure. The surgical incision healed uneventfully, and her pain decreased to a 3 on the 10-point visual analog scale. The patient gradually resumed normal walking and standing activities. She denied any pain in her foot 5 weeks after the procedure, and she remained pain free at 3-month follow-up.

**Procedure**

Local anesthesia is achieved with a proximal posterior tibial block of lidocaine, 1%. I avoid anesthetic block in the surgical field because this could make the sonographic images more difficult to interpret. The foot is prepared and draped in a sterile manner. The heel is scanned with a 7.5-MHz ultrasound probe with real-time imaging in the longitudinal and transverse views.

First, a longitudinal real-time ultrasound view is used to locate the insertion of the plantar fascia at
the anterior and inferior junction of the medial calcaneal tuberosity (Fig. 1). A 1.25-inch, 25-gauge needle is inserted medially into the heel perpendicular to the long axis of the foot aiming for the plantar fascia insertion. The needle appears as a small hyperechoic point moving in and out of the screen. If the insertion is not localized appropriately, the needle can be reinserted more proximal, distal, inferior, or superior. Subsequently, the needle is removed, and a minimal-incision beaver-type blade is used to make a vertical incision at the predetermined location.

Next, the ultrasound probe is switched to the transverse real-time ultrasound view (Fig. 2). An incision is made with the blade to release the medial one-third band of the plantar fascia from a deep to a superficial direction. Care is taken to avoid damaging adjacent soft-tissue structures when releasing the plantar fascia. The release is confirmed with real-time imaging, which demonstrates gapping in the plantar fascia. The procedure ends when the blade is visualized to move back and forth without resistance.

The fasciotomy is documented with final transverse (Fig. 3) and longitudinal (Fig. 4) views. The blade is withdrawn, and a sterile dressing is applied. Sutures are not required for wound closure.

**Discussion**

Ultrasound guidance offers some potential improvements over the original Weil procedure. Placement of the blade at the plantar fascia insertion may improve accuracy. Visualization of the blade during plantar fascia release may minimize trauma to adjacent soft-tissue structures and confirm a successful release. On the other hand, critical inspection of Figures 3 and 4 suggests that visualization for this procedure may still be weak or inadequate for some surgeons. Visualization could potentially be improved by using a transducer with a frequency higher than 7.5 MHz.

There are also potential disadvantages of this modified procedure. The operator must be proficient in sonography and must be able to accurately interpret the real-time images. The use of diagnostic ultra-

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**Figure 1.** A needle is used to locate the insertion of the plantar fascia. The ultrasound probe is placed on the medial heel parallel to the long axis of the foot for a longitudinal view of the heel.

**Figure 2.** The medial heel percutaneous incision is demonstrated with the ultrasound probe placed for a transverse view of the heel. The probe is placed perpendicular to the long axis of the foot and parallel to the blade.

**Figure 3.** Transverse heel image taken immediately after plantar fasciotomy displays the blade (B) inserted medially into the plantar fascia (PF) superficial to the calcaneus (C). The blade appears as a strongly hyperechoic linear object and is noted to move up and down freely at the medial insertion of the plantar fascia after release.
sound may increase the unit cost to the patient per procedure. Furthermore, the total time required to complete the procedure is increased.

Conclusions

An ultrasound-guided Weil percutaneous plantar fasciotomy technique was used to successfully treat a 48-year-old woman with chronic plantar fasciitis. This technique can be performed in an office or hospital surgical setting. Further studies are required to determine whether this ultrasound-guided fasciotomy improves patient outcomes over the original Weil technique. The details of this technique may be useful to podiatric physicians and surgeons who treat chronic plantar fasciitis.

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References