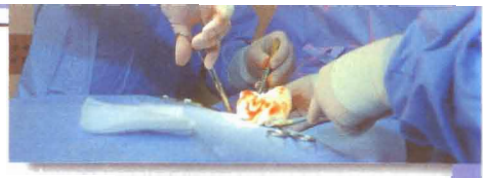
By Richard T. Braver, DPM



SURGICAL SOLUTIONS FOR TREATING POSTERIOR HEEL DEFORMITIES

Picking the correct surgical procedure is as important as drawing the initial skin incision if you want to ensure an exceptional outcome for your patient. Granted, there is an array of surgical procedures for correcting Haglund's deformity. However, there are some pertinent guidelines you should consider in order to make the correct call.

First, you need to assess the cause of posterior heel pain. This dilemma is usually caused by several of the following:

- a hypertrophied posterior superior surface of the calcaneus;
- a high inclination angle of the calcaneus, which causes its posterior superior surface to tilt backwards, leading to irritation of the Achilles tendon or skin;
- a long horizontal calcaneus; or
- Achilles insertional calcification/exostosis (calcaneal step deformity), which occurs across the distal two thirds of the posterior surface of the calcaneus, leading to irritation of the Achilles tendon.

Keep in mind that biomechanical factors can also contribute to a painful posterior heel in terms of sheer and pressure upon the Achilles tendon and/or skin.

Certainly, you should exhaust conservative treatment measures before looking at surgical options. You may use orthotics for structural and biomechanical faults. Also consider the merits of physical therapy, corticosteroid injections, heel lifts and shoe changes. Be sure to rule out arthritic disease, as well as any other degenerative disease processes, prior to performing surgery.

Is It Haglund's Deformity?

When you analyze a lateral weight bearing X-ray of a patient suffering from Haglund's deformity, be aware that the Fowler-Philip angle of the calcaneus is usually greater than 75 degrees.[1] However, do not rely upon this measurement as the sole criteria for performing Haglund's surgery. Keep in mind that many patients who had a painful Haglund's deformity had less than a 75 degree Fowler-Philip angle and still needed surgery.

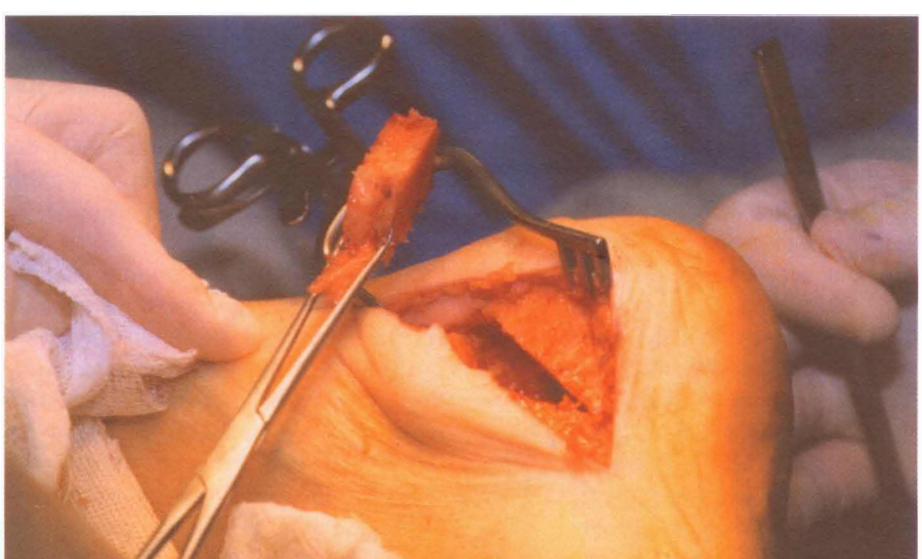
In addition, be aware that several patients who had the Haglund's deformity removed have had recurrences. This is particularly the case when you're treating patients who have high arched feet.

Why is this happening? I believe the posterior tilt of the calcaneus plays a key factor in recurrence. Therefore, you should also consider Ruch's total angle measurement on the lateral X-ray, the summation of the Fowler-Philip Angle and the Calcaneal Inclination Angle. According to Dr. Ruch, when the sum of these angles is greater than 90 degrees, this is a more accurate diagnostic indicator of a clinical Haglund's deformity.[2]

When There Is A Normal Or Low Calcaneal Angle

In order to keep this surgical treatment simple, you should address the size, shape and angle of the heel bone. If there is a normal or low calcaneal inclination angle with a hypertrophied posterior superior process, then you should remove this hypertrophied prominence while the patient is in the prone position.

Proceed to make a linear longitudinal incision approximately one cm. lateral to the posterior margin of the heel. Your incision should extend from just above the superior margin of the calcaneus to the distal one third of this bone. Deepen the incision via sharp and blunt dissection, and make sure you retract the sural nerve. Then make a deep incision directly to the



You should consider doing the Keck and Kelly osteotomy (shown above) when your patient has a high arched foot with a high calcaneal inclination angle.

periosteum of the bone. Direct your attention posteriorly, using a periosteal elevator to free up soft tissues from the superior half to one third of the posterior calcaneus.

Perform the dissection anterior and proximal to the Achilles tendon. Keep in mind that you should retract the Achilles medially. Examine the soft tissues directly superior and posterior to the calcaneus and keep an eye out for enlarged retrocalcaneal bursa, which you may excise. Use an osteotome and mallet to resect (lateral to medial) the hypertrophied bone of the superior posterior surface of the calcaneus. Remodel the bone accordingly and rasp it smooth.

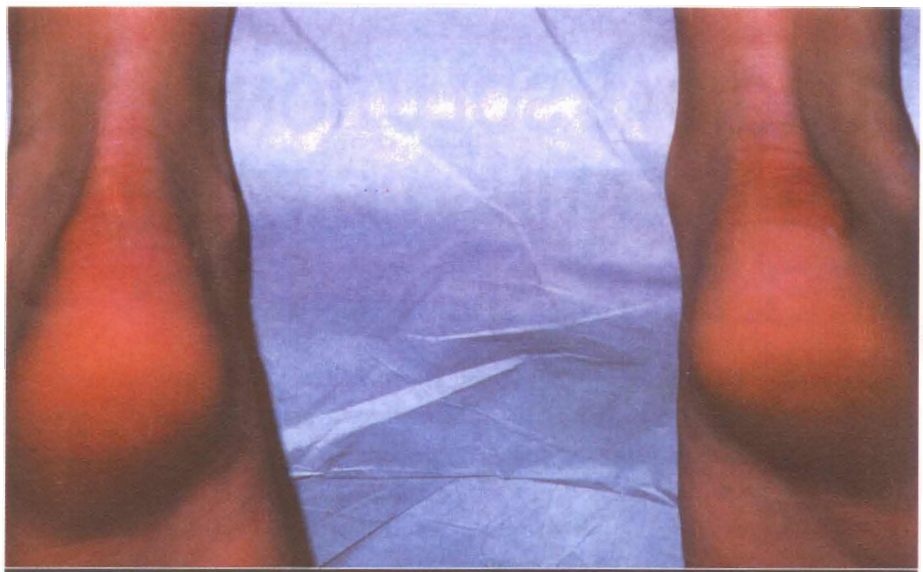
Do a vigorous irrigation. Proceed to reunite and close the soft tissues, using 2-0 vicryl in a simple interrupted suturing technique. Use a 4-0 vicryl suture to close the subcutaneous tissues. Then close the skin by using a running subcuticular suturing technique via 4-0 vicryl or prolene sutures.

Treating A High Arched Foot With A High Calcaneal Angle

When your patient has a high arched foot with a high calcaneal inclination angle, you should consider the Keck and Kelly osteotomy instead of the solitary Haglund's bump removal.

(You may also use this osteotomy to treat the painful Achilles insertional calcification/calcaneal step deformity, providing that you don't see any significant degeneration or thickening of the Achilles tendon. If there is Achilles involvement, remove the step deformity and proceed to repair and re-attach the Achilles tendon via bone anchor.)

When performing the Keck and Kelly osteotomy, shift the posterior heel forward and tilt it upward. This allows you to create a clinical lengthening of the Achilles tendon, which reduces tension at its insertion. With your patient lying in the prone position, use the skin-marking pen to draw the outline of the calcaneus. Make a curvi-linear/hockey stick incision, starting approximately 3 cm. above the superior aspect of the calcaneus and just lateral to the Achilles tendon. Extend this incision downward around the curve of the calcaneus, coursing along the inferior aspect of the calcaneus and ending near the calcaneal cuboid joint.



Take note of the right posterior heel deformity. In order to make the right surgical call, you need to assess the cause of the posterior heel pain.

What To Look For In Your Dissection

With sharp and blunt dissection, deepen the incision down to the level of the heel bone. Use the wet sponge technique to free the subcutaneous tissues from the periosteum. After the initial incision, make a sharp linear incision. Using a key elevator, sharply dissect the periosteal tissues from the calcaneus. Make sure you expose the dorsal aspect of the calcaneus so you can see the posterior process of the talus. Proceed with further dissection plantar laterally so you can identify the plantar calcaneal tuberosity.

Now direct your attention toward the posterior superior aspect of the heel bone. Examine the bursa. If it is enlarged, proceed with a total bursal excision. In addition, if you see an enlarged posterior superior aspect of the calcaneus (Haglund's bump), dissect it free of soft tissue attachments and resect the hypertrophic bone from lateral to medial with an osteotome and mallet. Then rasp the bone smooth.

Proceed with further dissection so you can examine the Achilles tendon. Palpate the tendon for rough areas or intra-Achilles ossification. If you discover these things, sharply excise them. Also be sure to excise any frayed portion of the visible Achilles tendon.

At this time, if there is a calcaneal step deformity present, you may retract the Achilles medially. If the step deformity is accessible, you may remove it with an osteotome and mallet or bone rasp. However, keep dissection in this area to a minimum. Make sure you keep the distal one-third of the Achilles insertion intact and attached to the posterior surface of the heel bone.

Now focus on the lateral surface of the calcaneus. You should be able to identify the posterior subtalar joint articulation and the lateral plantar calcaneal tuberosity. Given these landmarks, use a marking pen to draw the wedge of bone you want to remove with the apex plantarly. After your initial skin incision, reflect the periosteum away from the calcaneus. Use a wide sagittal saw (Hall blade # 5053-233) for the bone cut.

Proceed To The Osteotomy

Make the initial bone cut perpendicular to the calcaneus and extend it just posterior to the posterior subtalar joint articulation, ending at the plantar aspect of the calcaneal tuberosity. Then you need to

perform a second osteotomy posterior to the initial cut and angle it in such a way that the apex is plantar. Make the cuts through and through from lateral to medial, and excise the wedge of bone. Keep in mind that a typical wedge of bone may be 1 to 1.5 cm. wide superiorly. Then feather the apex of the cut with a sagittal blade.

It is important to dorsiflex the foot to close down the osteotomy while feathering the cut. Be careful not to make the osteotomy any wider. It is advantageous to leave the medial periosteum intact. Once you've secured a tight closure, insert one or two of the two prong staples across the osteotomy site to maintain closure.

In order to get the staple flush with both the anterior and posterior portions of the osteotomy, insert the posterior prong of the staple first into the posterior aspect of the calcaneus. Since the posterior aspect is wider than the anterior aspect of the calcaneus, doing it this way will facilitate direct contact of the staple against both cortices of bone.

At this time, you'll usually see a dorsal lip of bone at the posterior superior aspect of the calcaneus. You may remove it with a rotary burr, rongeur or bone rasp.

Irrigate the area with sterile saline solution. Then suture the paratenon of the lateral aspect of the Achilles tendon into the subcutaneous tissues and periosteum with 2-0 vicryl in simple interrupted suturing techniques. Perform further subcutaneous closure by using 2-0 and 3-0 vicryl in simple interrupted suturing technique. Hold the patient's foot at 90 degrees during closure. Close the skin, using 4-0 prolene or vicryl in a running subcuticular suturing technique, and apply well-padded dressings. Place the patient in a posterior splint cast, with the foot at 90 degrees or mildly plantarflexed. Keep in mind that the typical post-op course involves a cast change at 10 days with non-weight bearing status for six weeks.

Final Notes

Performing the Keck and Kelly osteotomy enables you to reduce the Fowler-Philip angle; shorten the entire horizontal length of the heel bone; and reduce the prominence of the posterior superior calcaneus, not to mention reducing the tension of the Achilles tendon upon its insertion. While you may find it more time-consuming and/or technically difficult to perform the calcanceal osteotomy, more often than not, it is the correct surgical procedure. ■

References

1) Fowler, A; and Philip, J.F. Abnormality of the Calcaneus as a cause of painful heel; its diagnoses and operative treatment. Br. J. Surg 32: 494, 1945

2) Ruch, J.A.. Haglund's disease. J.A.P.A. 64: 1000, 1974.

Dr. Braver is board certified in foot and ankle surgery by the American Board of Podiatric Surgery. A Fellow of the American College of Foot and Ankle Surgeons, he practices in Englewood, NJ.