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. 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.

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 ostectomy instead of the solitary Haglund's bump removal.

(You may also use this ostectomy to treat the painful Achilles insertion 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 ostectomy, 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.

**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 periosseum. 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 the Achilles insertion calcaneal bump (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 periosseum 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
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(doxepin hydrochloride cream), 5%
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**For Topical Dermatologic Use Only — Not For Ophthalmic, Oral, or Intranasal Use**

**INDICATIONS AND USAGE:** PRUDOXIN™ Cream is indicated for the short-term (up to 6 weeks) management of pruritus in patients with the following forms of eczematous dermatitis: atopic dermatitis, nummular eczema, and chronic stasis dermatitis. (See DERMATITIS AND ADMINISTRATION.)

**CONTRAINDICATIONS:** Because doxepin HCl has a histamine-like effect and serotonin-like plasma levels of doxepin are anastomosed to topical PRUDOXIN™ Cream application, the use of PRUDOXIN™ Cream in contaminated individuals or with untreated narrow angle glaucoma or a history of urinary retention.

PRUDOXIN™ Cream is contraindicated in individuals who have shown previous sensitivity to any of its components.

**WARNINGS:** Drowsiness occurs in over 20% of patients treated with Doxepin HCl Cream 5%, especially in patients receiving treatment to greater than 15% of their body surface area. Patients should be warned of this possibility and cautioned against driving a motor vehicle or operating hazardous machinery while being treated with PRUDOXIN™ Cream. Patients should also be warned that the effects of alcohol beverages can be potentiated when using PRUDOXIN™ Cream. If excessive doxepin occurs or it may be necessary to re-evaluate the number of applications, the amount of cream applied, and the percentage of body surface area treated, or discontinue the drug.

**SIDE EFFECTS:** Drug Intolerance: Studies have not been performed examining drug interactions with PRUDOXIN™ Cream. However, side effects may occur especially when doxepin is used in combination with alcohol drinks. As plasma levels of doxepin similar to therapeutic ranges for antidepressant therapy can be obtained following topical application of PRUDOXIN™ Cream, it would not be unexpected for the following drug interactions to be possible following topical PRUDOXIN™ Cream administration.

**Monoamine Oxidase Inhibitors:** Serious side effects can occur when doxepin is administered in combination with monoamine oxidase inhibitors (MAOIs) or within 15 days of abrupt withdrawal of MAOIs. Therefore, MAO inhibitors should be discontinued at least 2 weeks prior to administration of treatment with PRUDOXIN™ Cream. Chlorpheniramine: CHLORPHENIRAMINE has been reported to produce paresthesia in patients with doxepin HCl Cream 5% and it is not expected that the following drug interactions to be possible following topical PRUDOXIN™ Cream administration. Higher plasma levels of doxepin may be observed in patients taking CHLORPHENIRAMINE, especially those taking CHLORPHENIRAMINE doses exceeding 4 mg/day.

**DOSAGE & ADMINISTRATION:** Topical application of PRUDOXIN™ Cream is applied four times each day with at least a 3 to 4 hour between applications. There are no data to establish the safety and effectiveness of PRUDOXIN™ Cream when used for greater than 8 days. Chronic use beyond eight days may result in higher systemic levels. However, benzodiazepines may potentiate any respiratory depression. Excessive and forced diuresis generally are not of value in the management of overdosage due to high dose and prolonged use of doxepin HCl.

**DOSAGE AND ADMINISTRATION:** A thin film of PRUDOXIN™ Cream should be applied four times each day with at least a 3 to 4 hour between applications. There are no data to establish the safety and effectiveness of PRUDOXIN™ Cream when used for greater than 8 days. Chronic use beyond eight days may result in higher systemic levels. However, benzodiazepines may potentiate any respiratory depression. Excessive and forced diuresis generally are not of value in the management of overdosage due to high dose and prolonged use of doxepin HCl.

**Hypersensitivity:** PRUDOXIN™ Cream is available in a 45 g (NDC 066-3600-45) aluminum tube. Store at or below 22°C (72°F). It is only distributed by:

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**Surgical Pearls**

perform a second osteotomy posterior to the initial cut and angle it in such a way that the apex is planar. 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 dorsifly the foot to close the osteotomy while feathering the cut. Be careful not to make the osteotomy any wider. It is advantageous to leave the medial plantar intact. Once you've secured a tight closure, insert one or two of the two prong staples to the osteotomy site across the maintenance closure.

In order to get the staple flush with both the anterior and posterior portions of the osteotomy, insert the posterior portion of the staple first into the apex of the posterior 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 on the calcaneus. You may remove it with a rotary burr, rongeur or bone graft.

Irrigate the area with sterile saline solution. Then suture the paratenon of the Achilles tendon into the subcutaneous tissues and platelet with 2-0 Vicryl in simple interrupted suture technique. Perform further subcutaneous closure by using 2-0 and 3-0 Vicryl in simple interrupted suiting 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 10 days cast removal with no 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 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 calcaneal osteotomy, more often than not, it is the correct surgical procedure.

**References**
