

## THE LATERAL APPROACH TO INSERTIONAL CALCIFIC TENDINOSIS OF THE ACHILLES

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This article reprises the author's Update 2002 article on another approach to posterior heel surgery. This surgical approach to retrocalcaneal Achilles tendinopathy continues to be my preference, I have now done my last 13 cases over the last 3 years in this fashion and patients are satisfied and I have had no wound complications and no avulsions. No procedure, especially for the often problematic spectrum of Achilles tendinopathy and associated insertional calcific deposits is a panacea, but my change to this approach 3 years ago has all but eliminated my perioperative stress and fears with this procedure and these patients and that lurking potential I frequently feared for catastrophic failure due to wound healing problems on the posterior heel.

What is clearly understood today is that the cause of posterior heel pain is multifactorial, that surgery is a viable option for those patients that fail to respond to conservative care, and that surgery is by no means 100% curative. The reasons for unsuccessful results or incomplete resolution of preoperative symptoms include inadequate spur resection, wound healing complications, tendon rupture or continued enthesopathic type pain and the fact that the causative factors of retrocalcaneal pain include the negative biomechanical forces of equinus and uncompensated or partially compensated hindfoot and forefoot deformities.

The author has personally witnessed chronic wounds secondary to posterior heel surgical exposure, complications from retained and superficial mitek anchors causing non healing ulcerations, chronic edema and scarring in the surgical zone and continued discomfort from inadequate spur resection in combination with persistent retrocalcaneal bursitis and posterior heel prominence. Recurrence of radiographic spurs is not uncommon and may or may not be associated with recurrence of symptoms.

The myriad of surgical approaches all attempt to "tweak" the tendon approach and minimize disruption of its attachment, allow for adequate spur resection and removal of intratendinous calcifications if present and address underlying biomechanical deformity such as equinus if at all possible.

### SALIENT CLINICAL FEATURES

Haglunds deformity is a purely superolateral prominence of the posterior calcaneus, readily approachable through a straight lateral incision and is not the focus of this paper.

It is the author's experience that the vast majority of patients with mechanically induced posterior heel pain suffer not only from the physical and psychological discomfort of the presence of a posterior spur and its associated enthesopathy but also from a pure posterior prominence that causes a "bulky" posterior heel. This consistently leads to difficulty and pain from the heel counter and generalized shoe irritation. Retrocalcaneal bursitis is a frequent accompanying complaint. A significant confounding issue is that patients often find it difficult to understand why a "bump" on their heel is perceived as so difficult to treat by their physician and not rapidly rectifiable.

The role of equinus in causing posterior heel pain is difficult to quantify but it seems logical and probable that the patient subset that suffers from this malady, often obese and deconditioned, have triceps or gastrocnemius equinus either as a primary deforming force or as a response to guarding from posterior heel pain. A local anesthetic block around the insertion of the Achilles during the clinical exam can help clarify the true contribution of equinus to the posterior heel pain.

Those patients failing all accepted standards of conservative care are offered a surgical approach to their condition and immediately admonished that "if they are 75% better by one year after surgery it is considered an excellent result" This is an integral component of the informed consent discussion and promptly engages the patient in realistic expectations of the surgical outcome.

### STANDARD RADIOGRAPHS

The standard angle and base of gait plain films are improved upon by the modified lateral heel view as described by Gabbay and Ruch which internally rotates the foot 30 degrees to the xray plate. This very effectively gives a truer view of the posterior aspect of the heel by

compensating for the obliquity of the posterior face of the heel and allowing more direct visualization of retrocalcaneal spurring. The standard "sunrise" view or 10 degree calcaneal axial as well as soft tissue enhancement by decreasing KvP also enhance the preoperative appreciation of the amount of posterior or intratendinous spurring.

### PERTINENT ANATOMIC FEATURES

An intimate knowledge and appreciation of the anatomy of the Achilles insertional zone is mandatory to effectively perform posterior heel surgery.

The location of the majority of spurring is clearly on the ridge of bone that separates the central third and inferior third of the posterior calcaneus. Although the insertion of the Achilles is classically described as the central third of the heel, the author concurs with Sarrafian and Downey that it might more accurately be "the distal  $\frac{1}{2}$  of the posterior heel". This is of critical importance in allowing the authors surgical approach as will be demonstrated.

One must carefully appreciate the confluence of the tendon, fascial and periosseal tissues that surround the Achilles insertion and allow for the tendon to be maintained as a continuum of tissue about the posterior aspect of the heel and on into the plantar fascia. The integrity of these tissues and fascial elements are strong enough to resist dorsiflexion "even in the absence of an intact Achilles tendon" according to Peebles. There exists essentially an envelope of connective tissue that surrounds the Achilles' insertion and merges seamlessly with the periosteum of the calcaneus.

The spur location as noted is between the central and inferior third of the posterior heel. Boberg points out that the Achilles therefore inserts proximal to the spur and the spur is not intratendinous but rather subperiosseal. He then advocates a direct transverse approach and states that tendon disruption is minimal if any and the dissection may be extended superiorly as needed to remove intratendinous calcifications. The author has tried this approach and encountered an occasional resistant edema and induration on the posterior heel that becomes painful in shoe gear. Interestingly, this "excessive subcutaneous scarring" was noted as a drawback of the classic Fowler-Philip surgical approach as noted by Sundberg and Johnson in *Jahs' Disorders of the Foot and Ankle Medical and Surgical Management*, 2nd edition.

The remainder of surgical approaches discussed over the last several years all include some direct violation of the Achilles tendon from a direct posterior approach with the need for reattachment or reinforcement dictated by the individual cases.

### AUTHOR'S SURGICAL APPROACH

This approach makes no statement of originality yet adds another technique to the multitude described by other PI faculty members in recent years. In fact, an outstanding article supporting this approach is now published by Watson.<sup>1</sup> This approach was decided on in an effort to ensure complete bone spur removal, allow for reduction of the posterior prominence of the heel, allow for removal of an inflamed retrocalcaneal bursa, avoid any potential wound compromise by avoiding the posterior aspect of the heel and avoiding any disruption of the above described tendinous, fascial and periosteal elements as they envelope the Achilles' insertion.

Incision placement is via a direct lateral approach, located slightly anterior to a conventional Haglund's approach. The most prominent portion of the posterior heel is marked with a skin scribe prior to infiltration of local anesthetic to avoid losing reference after inflation of the soft tissues. This allows a more perpendicular encounter with the lateral wall of the calcaneus which facilitates the posterior heel and spur removal. Periosteal dissection is carried out anteriorly on the lateral wall of the heel and then the spur is immediately identified posteriorly. Dissection is carried out meticulously subperiosteally from the spur both in a superior direction and then inferiorly.

Essentially this approach addresses the spur and Achilles' insertional zone from "inside out" thereby never violating the confluence of connective tissue that envelopes the Achilles' insertion. This dissection is carried out completely inferiorly to the most inferior aspect of the heel. Because the tendon starts its insertion in the central third of the posterior heel, some initial DEEP fibers are detached but no tendon weakening is noted because the superficial connective tissue and fascial elements remain undisturbed. All other techniques violate this connective tissue envelope by coming at the tendon from a "superficial to deep" or "posterior to anterior" approach via posterior incisions which by design must affect the integrity of tendinous fibers and could potentially weaken them. Meticulous dissection when elevating the Achilles tendon via subperiosteal dissection maintains this sleeve of the insertional zone in tact and minimizes the risk of avulsion. Clinicians typically find this hard to believe but it is true. I have had no avulsions to date of the Achilles and have not used a single soft tissue anchor.

It is my belief that this condition is primarily a dysvascular state of the affected Achilles tendon in the region. There is literature to support this and is referenced in the above mentioned Watson's article. Exposure of the raw cancellous bone after the below described partial

calcaneal osteotomy allows an excellent tenodesis bed for the Achilles and I believe allows for an ideal local opportunity for revascularization of the insertional zone of the Achilles thereby minimizing risk of avulsion. Soft tissue anchors may certainly be used to enhance repair but I have not found them necessary. In fact I believe they add another dysvascular element to an already compromised area. My preference would be an absorbable biocorkscrew from Arthrex if the need arose.

A sagittal saw and osteotome are then used to effect a complete through and through resection of the posterior heel and the entire posterior spur with it. An osteotome may be required to completely detach the most medial aspect of the calcaneus and certainly an ancillary medial incision could be made although the author has not found

it necessary to date. This posterior resection is then removed en toto leaving a nice bleeding cancellous bed for tenodesis. No reattachment nor anchors are needed as no superficial tendinous fibers have been detached. This also affects some relaxation of the Achilles' to offset the assumed equinus deformity. Any retrocalcaneal bursa is excised at the same time and this completes the excision of the posterior spurring and posterior prominence at the same time. Palpation of the intact Achilles under forceful dorsiflexion confirms the absence of any tendon compromise. Closure is per routine with careful attention to periosteal closure laterally to preserve the lateral expansions of the deep fascia and tendinous fibers. Non absorbable sutures are avoided as I feel they also add a further dysvascular element to the area.

### CLINICAL CASES



Figure 1. Straight lateral approach to posterior heel.

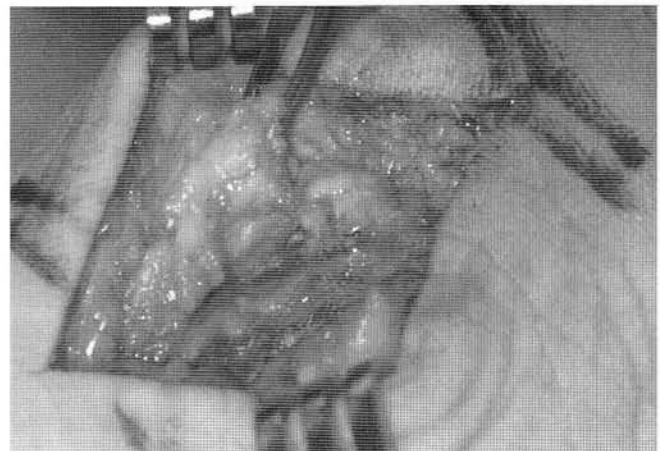


Figure 2. Subperiosteal dissection to identify the spur. All further dissection works off of this point distally and proximally.

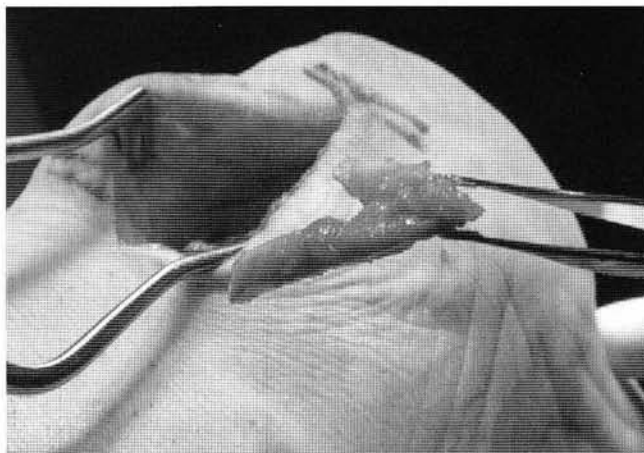


Figure 3. Planar resection of the posterior heel inclusive of the spur.

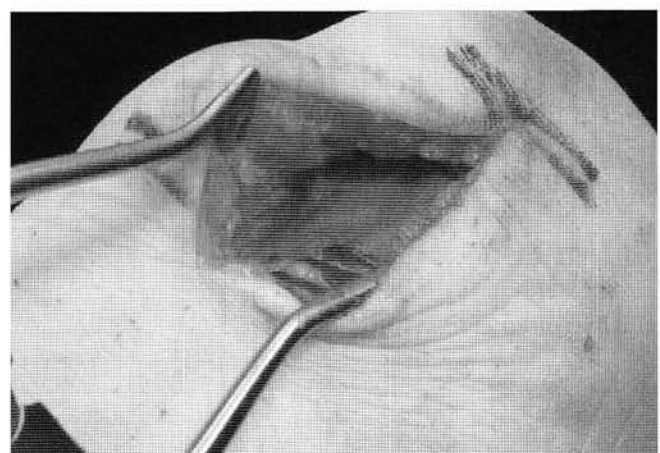


Figure 4. Exposed cancellous posterior heel region.

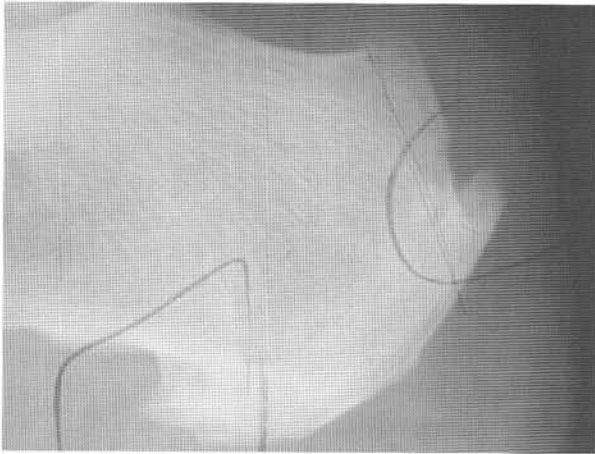


Figure 5. Preoperative example of mild posterior spurring.



Figure 6. Postoperative example.

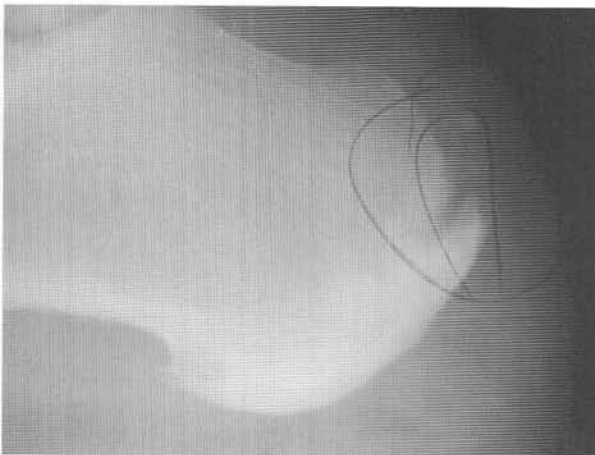


Figure 7. Preoperative of another case of mild posterior spurring.

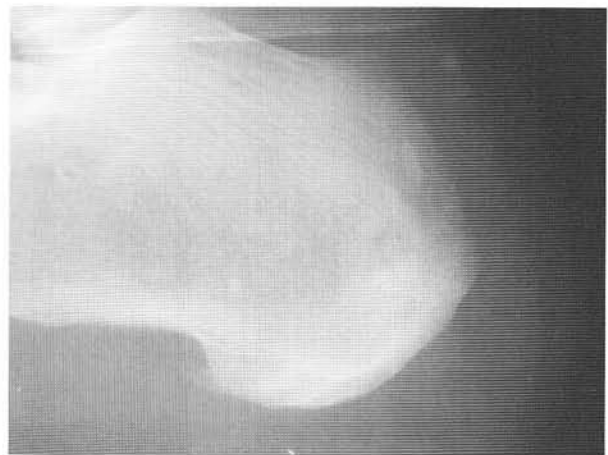


Figure 8. Postoperative of mild spurring.



Figure 9. One year postoperative view of a case of mild postoperative spurring. Notice there is some recurrent spurring. This is not uncommon and may or may not be symptomatic.

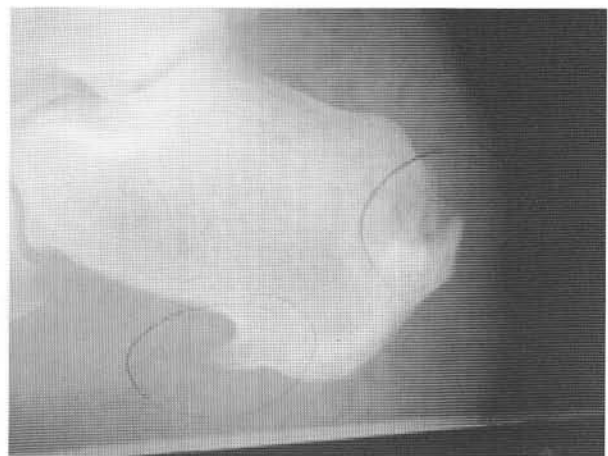


Figure 10. Preoperative of moderate spurring.





Figure 11. Postoperative of moderate spurring.



Figure 12. Two-year postoperative of moderate spurring. Notice again that there is some remodeling as expected of the posterior heel.

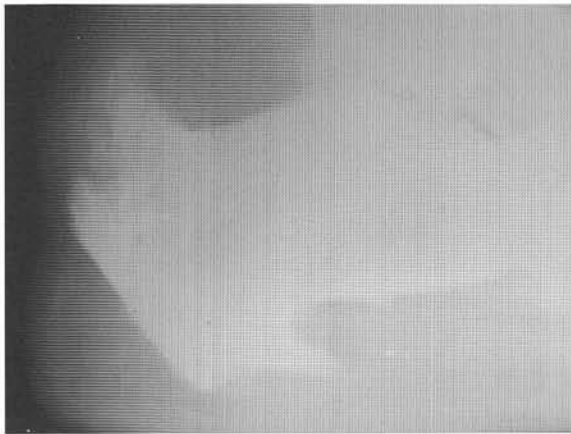


Figure 13. A case of severe posterior spurring with substantial intratendinous involvement. These deposits are shelled out using a number 11 blade and the tendon is thinned down from underneath if deemed necessary. This can often help reduce the posterior bulk and prominence of the posterior heel.



Figure 14. Postoperative view of case in Figure 13.

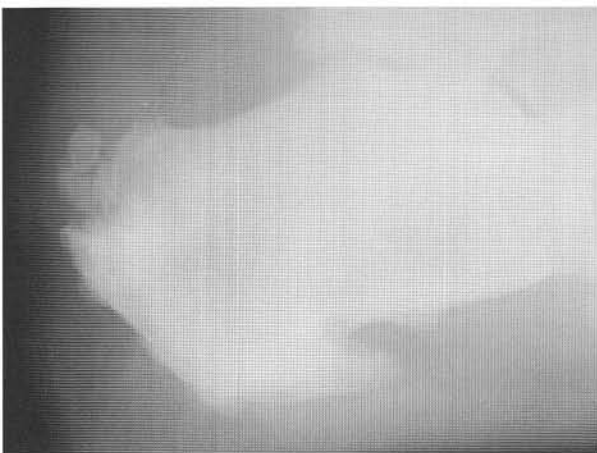


Figure 15. Contralateral foot operated on 6 months later with severe posterior spurring.



Figure 16. Postoperative view of case in Figure 15.

Patients are managed in a non-weightbearing cast for 6 weeks, then protective weightbearing for 2-3 weeks and followed by physical therapy as necessary. This series consists now of 13 patients and I have had had no adverse sequellae from the surgery nor wound complications. These cases illustrate nicely that equal or better posterior spur resection can be performed adequately through a lateral approach with no tendon disruption and no need for tendon reattachment nor retained implants.

#### REFERENCE

1. Watson A. Surgical treatment of calcific insertional Achilles tendinosis using the lateral approach. *Tech Foot Ankle Surg* 2003;2:186-91.