CHAPTER 19

INSERTIONAL ACHILLES TENDINITIS: A Different Perspective For Selected Patients

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There are probably a number of different sources for pain at the Achilles tendon insertion. Many of these patients will present with significant osseous spurring which may serve as a precursor to the symptoms, and once present, may contribute to local irritation, inflammation, and pain. However, in some circumstances spurring may be absent, or of such a small degree that one may not be satisfied that this is a true component of the symptoms. While certain biomechanical or structural faults may be identified in some patients, there are others with similar symptoms, where these findings may seem to be lacking. In other patients, there may be some mechanical problem noted, but one which may not be traditionally associated with pain at the Achilles insertion. It is this latter circumstance which has led the author to review the traditional approach to this condition in selected patients.

NOMENCLATURE

Puddu et al. felt that the generic term "tendonitis" was inappropriate for pain associated with the Achilles tendon. They proposed that there were three different forms of chronic Achilles tendon pathology: (A) Inflammation which involves the surrounding tissue without involving the Achilles tendon itself was termed *peritendinitis*. (B) The term *peritendinitis with tendinosis* was preferred whenever the surrounding tissues were inflamed and there was an associated degenerative process within the Achilles tendon. (C) The term *tendinosis* denoted a pure degenerative process within the tendon which was asymptomatic since the surrounding tissues were not inflamed.[1] The current author also prefers to use an additional term, *insertional Achilles tendinitis,* when referring to the pain and inflammatory changes which may be seen at the posterior heel. This would seem a logical designation as the primary pain typically does not involve the more proximal aspects of the Achilles, and may or may not be associated with osseous spurring. While some patients may present with concomitant symptoms, which extend into the distal or central extent of the Achilles, the origin of the pain is clearly noted to emanate from the insertional component of the tendon.

ETIOLOGY

The specific etiology of insertional tendinitis may be the same or different from that of other inflammatory conditions of the Achilles tendon. While this paper is not intended to provide a complete review of Achilles tendinopathy, it would appear that arthritides and biomechanical problems may be consistent with symptoms in either anatomic area. When present, the insertional spurring may provide a unique potential means of instigating pain. However, experienced clinicians will recall that like patients with plantar heel spurs, the presence of a posterior spur does not absolutely mean that symptoms will be present or necessarily develop at some later time. All of the factors that lead to symptoms in patients with posterior heel spurs are not completely known, but it has been the author's experience in patients undergoing excision of these fragments, that portions of the spurs are loosened or else freely moveable within the Achilles tendon. Excision of the spurring has been the primary means of surgical treatment for the condition, with most patients sustaining significant relief.

However, this again leads to the question as to what initiates the symptoms of patients without posterior spurs and what is the most reasonable approach for treatment when conservative options fail. Certainly, if the patient possesses either a gastrocnemius or gastrosoleal equinus, then appropriate lengthening of the Achilles tendon may alleviate the mechanical stress and associated symptoms. Yet in patients without spurring that the author has evaluated, good ankle motion has been consistently noted. Most of the patients have been reasonably young and without any history or findings suggestive of arthritic involvement. The only

significant structural or mechanical finding has been a pes cavus of varying degree. Usually this manifests as an anterior equinus deformity. This being the case, the author has attempted to re-evaluate the condition when contemplating surgical intervention in selected patients.

PREOPERATIVE EVALUATION

The author will present the following case presentation of a patient who had been referred for chronic insertional Achilles pain of each heel. This 39-year-old male had undergone extensive conservative care consisting of oral anti-inflammatory medications, physical therapy, padding, multiple changes in shoes, and immobilization. Clinical evaluation revealed distinct pain over the posterior calcaneus in the area of the Achilles tendon insertion. No swelling was noted and no tenderness was present in the Achilles tendon proximally. The ankle joint demonstrated a good range of motion, and radiographs demonstrated no overt problems at the posterior heel. The only significant finding appeared to be a pes cavus condition, particularly an anterior equinus (Fig. 1A-1C). There was no history or other symptoms consistent with arthritis.

As noted, there was a distinct anterior equinus deformity. Compensation would potentially create problems at the posterior heel through two means. The first would be due to the change in the inclination of the calcaneus, possibly affecting the way in which pressure was applied to the posterior heel. On the other hand, dorsiflexion at the ankle would be required to achieve balanced weight bearing between the forefoot and rearfoot, and could thus create the pseudoequinus previously described by Green and Whitney.[2]

One might consider two different surgical approaches based upon individual philosophy and upon the patient's response to different conservative approaches. If convinced that the tuber of the calcaneus was in-itself a problem, then this might be addressed with a calcaneal osteotomy such as described by Keck and Kelly.[3] Although these authors have generally been credited with describing the procedure, the same technique had been previously presented by Zadek.[4] Each of these authors appeared to develop the procedure with the premise that Achilles tendinopathy and inflammation was due to impingement of the

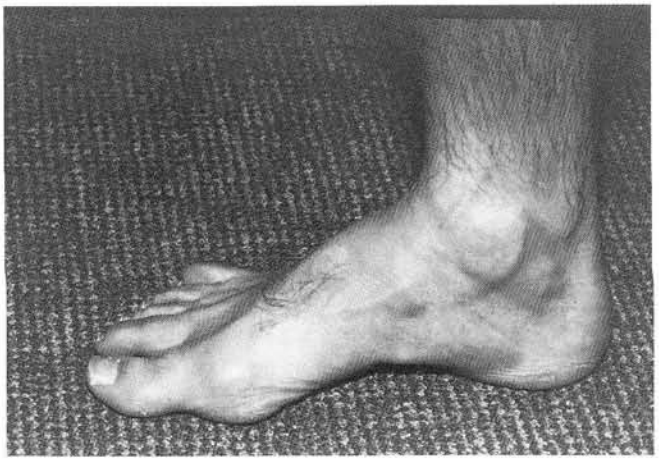

Figure 1A. Weight-bearing photograph.

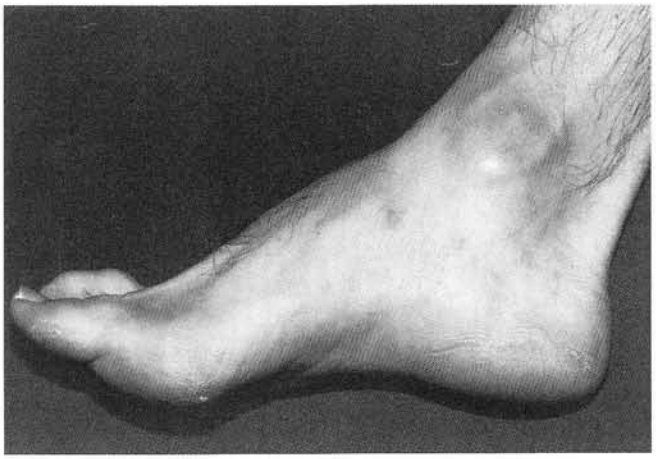

Figure 1B. Non-weight-bearing photograph of the patient.

Figure 1C. Preoperative lateral radiograph. Note the absence of any Achilles insertional spurring.

superior corner of the calcaneus on the tendon itself. Therefore, its use in the treatment of insertional Achilles pain would be extrapolated, as opposed to a primary historical indication. Nonetheless, the procedure has been used by some clinicians with the intent of reducing the prominence of the posterior calcaneus.

The author had employed this calcaneal osteotomy in the past for insertional Achilles tendinitis with less than satisfactory results. Upon closer review, it would appear that the structural change effected via this osteotomy at the posterior portion of the calcaneus was far less than expected. While the prominence of the superior corner of the calcaneus may be adequately addressed, the more central and distal aspects of the posterior calcaneal surface undergo little if any significant structural realignment. Furthermore, direct padding and protection of the posterior heel provided no relief in this particular patient, leading one to believe that primarily addressing the tuber with a similar procedure would be of little benefit.

It was also believed that the Keck and Kelly procedure did little to alter the tension of the Achilles tendon at the calcaneal insertion, particularly in someone with anterior equinus. In this patient, given the lack of spurring present, a basic premise of treatment was that the pseudoequinus created by the sagittal plane forefoot deformity would need to be addressed. Two methods of localizing the specific location or apex of the deformity have been described, Meary's and Hibbs angles. In this patient, both methods appeared to demonstrate the apex of deformity as the naviculocuneiform area (Fig. 2). Appropriate correction of the anterior equinus would appear to be accomplished via the Cole osteotomy.[5] This procedure would theoretically correct the anterior equinus, thus alleviating the imposed weight-bearing stress on the Achilles, but would also seem to exert a more substantive change on the overall pressures of the calcaneal tuber than the Keck and Kelly osteotomy.

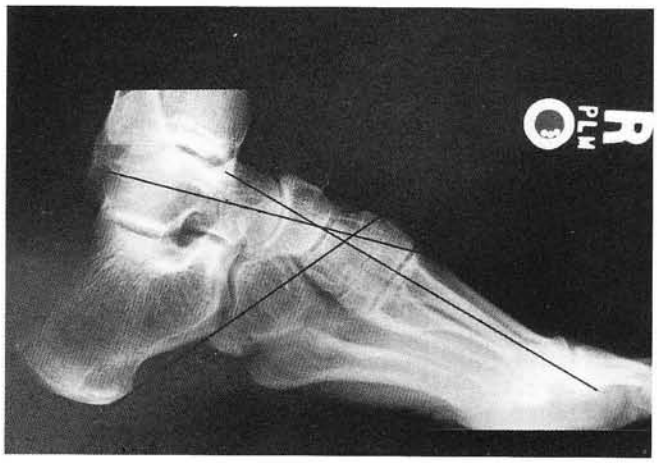

Figure 2. Preoperative radiograph demonstrating the convergence of Meary's and Hibbs angles indicating the apex of deformity.

The author considered the Cole with some reticence, having cautioned against its use in the past despite a lack of personal experience with the technique.[6] In addition, the procedure had not been viewed with wide approval by other members of the Podiatry Institute. However, more recent favorable experiences with the Cole osteotomy by Downey had demonstrated that the procedure could be performed with a minimum of morbidity and with good functional results.[7,8] Accordingly, the procedure was recommended to the patient with the understanding that this would work in theory, but had not been employed previously in actual practice.

The patient underwent surgery and recovered uneventfully, sustaining complete relief of his symptoms (Figs. 3A, 3B, 4A-4C). The Cole osteotomy was performed on the contralateral foot one year later, again with complete resolution of symptoms. In the author's opinion, this was a real test for this approach as no osseous spurring was present at the posterior heel. Therefore, the reorientation of the forefoot had a pronounced effect on rearfoot symptoms.

Since the success with this patient, the Cole osteotomy has been used in one other individual who also underwent resection of significant spurring at the posterior heel. This patient noted that a large dorsal prominence had posed a problem with her shoe wear for a number of years. She similarly experienced a full resolution of symptoms, as well as an alleviation of shoe pressure across the dorsum of the foot.

DISCUSSION

Fiamengo et al. proposed three factors which interact to create a symptomatic posterior heel. As noted earlier, a prominence at the posterior superior corner of the calcaneus can be an irritant. However, in most of these instances the specific difference in the origin of the symptoms can be appreciated clinically. It was also proposed that

Figure 3A. Immediate postoperative radiographs following the anterior tarsal resection.

Figure 3B. Immediate postoperative radiograph.

Figure 4A. Weight-bearing photograph of the patient at one year following surgery.

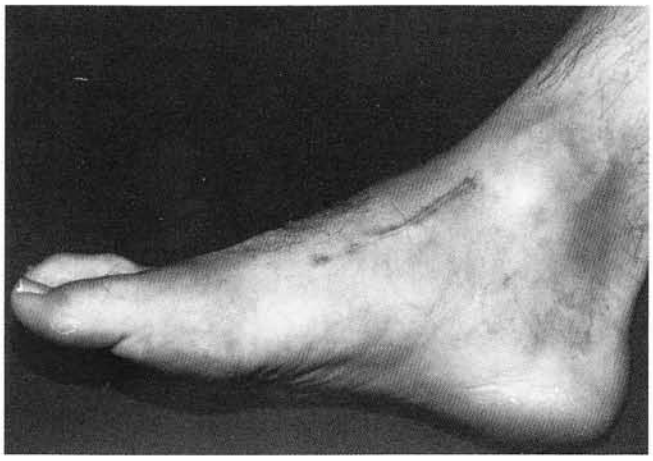

Figure 4B. Non-weight bearing photograph at one year postoperative.

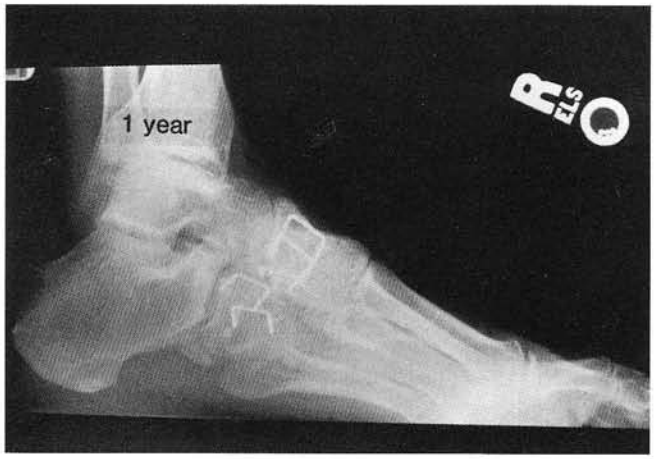

Figure 4C. Postoperative radiograph at one year.

patients with a longer horizontal axis or length of the calcaneus would place greater levels of stress on the Achilles tendon due to an enhanced mechanical advantage associated with this anatomic variation. Lastly, a posterior calcaneal step was found in a significant number of radiographs of symptomatic patients.[9]

Other factors which may create symptoms include a large insertional Achilles spur, especially if part of the spur has fractured or loosened. Pseudoequinus is another factor which has not been discussed by most authors relative to this topic. Whitney and Green noted that this condition was most commonly associated with the anterior cavus foot type. If the forefoot is flexible, then compensation for the deformity may occur through dorsiflexion of the joints within the foot as the forefoot is loaded during weight bearing. However, with more rigid feet, the dorsiflexion cannot be absorbed in the foot, and any available dorsiflexion within the ankle is utilized.[2]

Resection of the dorsal wedge of bone from the foot was originally described by Saunders. He described his results in 102 feet, having sustained excellent results in 28 patients, good results in 31, fair in 41, and poor in 2 feet. Of interest is that of the fair and poor results, most were not because of untoward consequences of the procedure itself, but due to ankle equinus, heel varus deformity, or other coexistent deformities not addressed at the time of the original surgery.[10] Cole proposed the same procedure five years later, but without providing any discussion of his results.[5]

This approach to posterior heel pain is proposed with some hesitation, especially considering the limited number of cases treated in this manner. The Saunders (Cole) procedure should not be used in every case of resistant posterior heel pain, but may be considered in those patients who possess distinct anterior cavus deformity where it is felt that the coexistent pseudoequinus condition is a primary force in the development of heel symptoms.

REFERENCES

1. Puddu G, Ippolito E, Postacchini F: A classification of Achilles tendon disease. *Am J Sports Med* 4:145-150, 1976.
2. Whitney A, Green D: Pseudoequinus. *J Am Podiatry Assoc* 72:365-371, 1982.
3. Keck S, Kelly P: Bursitis of the posterior part of the heel: evaluation of surgical treatment in 18 patients. *J Bone Joint Surg* 47A: 267-273, 1965.
4. Zadek I: An operation for the cure of achillobursitis. *Am J Surg* 43: 542-546, 1939.
5. Cole W: The treatment of claw foot. *J Bone Joint Surg* 22:895- 908, 1940.
6. Banks A: Pes cavus deformity. In Marcinko D, ed. *Medical and Surgical Therapeutics of the Foot and Ankle.* Baltimore,Md: Williams and Wilkins; 1992:506-515.
7. Downey M: Cole osteotomy. In Camasta C, Vickers N, Ruch J, eds. *Reconstructive Surgery of the Foot and Leg, Update '93.* Tucker, GA: Podiatry Institute Publishing; 1993:204-208.
8. Downey M: Cole osteotomy: a follow-up evaluation. In Vickers N, Miller S, Mahan K, Yu G, Camasta C, eds *Reconstructive Surgery of the Foot and Leg, Update '97.* Tucker, GA: Podiatry Institute; 1997:192-196.
9. Fiamengo S, Warren R, Marshall J, Vigorita V, Hersh A: Posterior heel pain associated with a calcaneal step and Achilles tendon calcification. *Clin Orthop* 167:203-211, 1982.
10. Saunders J: Etiology and treatment of clawfoot. *Arch Surg* 30: 179-198, 1935.