

DISORDERS OF THE ACHILLES TENDON

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A common podiatric complaint is pain in the region of the Achilles tendon. A careful examination and history taking helps decipher the condition(s), which ultimately may be inter-related. Rather than just call the diagnosis an Achilles tendinitis or a heel spur, which in part may be true, a straightforward examination, which will be illustrated, gives a more accurate diagnosis and ultimately an appropriate treatment protocol.

The common diagnoses that affect the Achilles tendon include bone conditions such as a Haglund's deformity (Figure 1) and posterior heel spurs with or without intratendinous calcifications (Figure 2). Soft tissue disorders include tendinitis, tendinosis, and retrocalcaneal bursitis. Even though the treatment may be similar for these conditions, there are some notable exceptions.

It is important to ask pertinent questions regarding the patient's symptoms. First, one should determine whether there is an element of post-static dyskinesia, pain after rest and improvement (loosening) as one ambulates. If so, then it is likely that there is at least a condition of tendinitis. Secondly, it is important to assess whether or not pressure to the back of the heel with a closed-in shoe is a source of pain. This would be consistent with a posterior heel spur, Haglund's deformity, and/or distal Achilles tendinosis.

Examination of the Achilles complex is performed first by visualization of both extremities. One should look for areas of asymmetry such as swelling of the body of the tendon (Figure 3) or a notable lump on the back of the heel (Figure 4). These areas are likely pathologic and will be further investigated with palpation and range of motion testing. Palpation of the Achilles complex is typically done in three zones. Zone 1 is the mid-body of the Achilles tendon (the watershed region); zone 2 is in the retrocalcaneal bursa; and zone 3 is at the posterior heel at the attachment site of the Achilles tendon (Figure 5).

When there is pain on palpation of the Achilles tendon in zone 1 without any appreciable thickening, hardening, or swelling of the tendon, then this is a tendinitis. This is typically an acute overuse injury. If however, there is palpable swelling and hardness of the tendon in this region, then the condition is tendinosis, which is a chronic degenerative disease state of the tendon. The treatment for these two conditions is very different, and will be reviewed later.

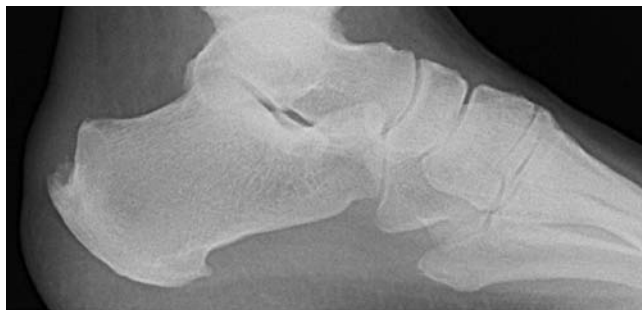


Figure 1. Typical appearance of a Haglund's deformity. Note the sharp aspect of the normally rounded "shoulder" of the posterior superior calcaneus. This patient has a posterior heel spur as well.



Figure 2. Posterior heel spur with intratendinous calcification.



Figure 3. Note the bulbous region of the Achilles tendon located in the watershed region. This is typical for tendinosis.

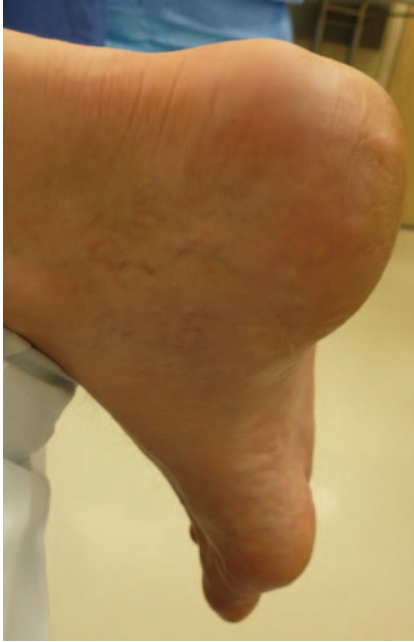


Figure 4. This patient has a “lump” on the back of the heel in a posterior, superior, and lateral location. This is associated with distal Achilles tendinosis and/or a Haglund’s deformity.

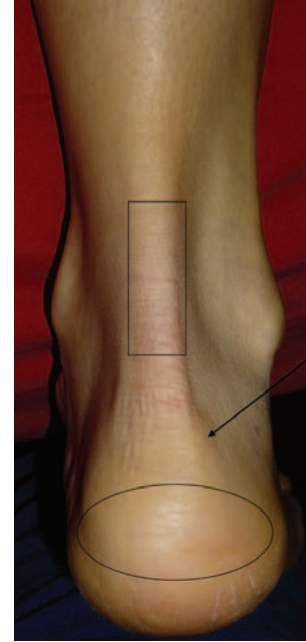


Figure 5. Zone 1 = rectangle, Zone 2 = arrow, Zone 3 = oval. Note that Zone 1 is where tendinitis and tendinosis occur (watershed area), Zone 2 is at the retrocalcaneal bursa, and Zone 3 is where insertional Achilles tendinitis and tendinosis occurs. Note that the medial and lateral expansion fibers can be painful in addition to the central region of the attachment. This is a broad area.

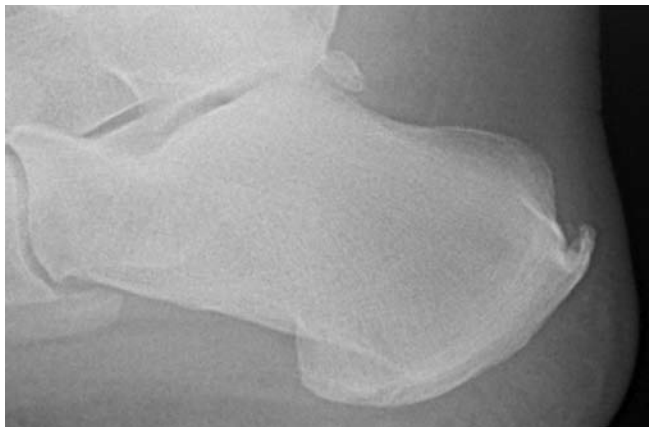


Figure 6. This patient has a posterior heel spur on the left foot that is asymptomatic.

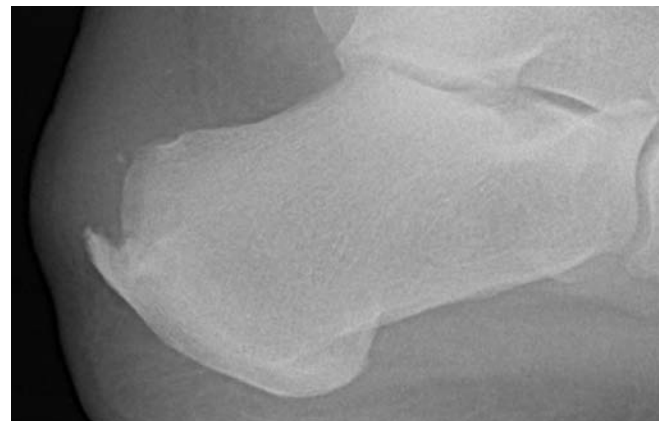


Figure 7. The same patient has a similar heel spur on the right foot, which is also symptomatic. Note the amount of soft tissue swelling that “makes the bump.”

Pain in zone 2 is consistent with a retrocalcaneal bursitis. Patients with a cavus foot type or a Haglund’s deformity may be predisposed to bursitis. Pain in zone 3 is consistent with an insertional Achilles tendinitis and if there is an appreciable lump, then it is more likely an insertional Achilles tendinosis.

In any of these conditions, there may be an associated posterior heel spur. So what does that mean? In the

condition of plantar fasciitis, we tell our patients all day long that the spur does not cause the pain and that it is a soft tissue problem. Is that the case with posterior heel pain? It is my opinion that the spur does not cause the pain (Figures 6 and 7). However, when I do surgery for insertional Achilles tendinitis/tendinosis, I do remove the heel spur. The reason is two-fold. First, it is important to provide a raw cancellous bone interface with the tendon for tenodesis and

the second reason is that the bleeding of the bone provides a good healing environment and vascularization for the diseased state of the distal Achilles tendon. It is no different when performing a Kidner procedure; it is preferable not only to remove the accessory bone, but also to remove overhanging navicular to be flush with the medial cuneiform so that there is good raw bone to provide vascularity to the posterior tendon. This is an analogous condition to the insertional Achilles tendinosis.

Once the appropriate diagnosis is made, treatment can be initiated. A treatment algorithm will illustrate a step-wise approach for each condition. There is some overlap as some of the treatments are similar.

For tendinitis, we are dealing with an acute inflammatory condition, which can be treated with any modality that will reduce inflammation. Typically tendinitis is treated initially with rest, icing, and using a heel lift for a 3-4 week period. A referral to physical therapy can be done at this time as well. Typically that is my second line of treatment, however it is appropriate for initial treatment. If these treatments fail, then an immobilization period is initiated by using a fracture boot. If there are no contraindications, I will use a tapered dose of prednisone consisting of 60/40/20/10/5 mg x 3 days each.

After a month of immobilization, if there is still pain, one can consider an intermediary to surgery, which would include injections of PRPs or extracorporeal shock wave therapy. These may be somewhat experimental, but certainly they have a role in the treatment protocol. Only time will tell after the evidence is reviewed if these intermediary treatments will become a standard of care in the treatment of tendon disorders. Finally, surgery can be performed if all else has failed and generally I will do a gastrocnemius recession if there is a significant equinus deformity and radiofrequency coblation of the Achilles

tendon in the area of pain (Figure 8).

For insertional Achilles tendinosis, anti-inflammatory medications do not typically fare well. I will generally start with physical therapy. There are two proven techniques to conservatively treat tendinosis, which include ASTYM (a manual tendon scraping technique using a plastic or metal spoon-like apparatus) and eccentrically loading exercises. If therapy fails, I will try immobilization in a fracture boot with a tapered dose of prednisone as above. From a surgical standpoint, if there is a Haglund's deformity and/or a posterior heel spur, both should be removed (Figure 9). Radiofrequency coblation along with debulking of the distal Achilles tendon is also done (Figure 10). Fixation of the tendon to the heel bone can be done per surgeon preference (Figure 11). In cases where there is no abnormality of the posterior heel (i.e., no heel spur or Haglund's deformity), radiofrequency coblation alone has been quite effective (Figure 12).

For mid-body Achilles tendinosis, a similar protocol for insertional tendinosis is performed. If conservative treatment fails, then surgery will include a gastrocnemius recession to address any equinus (if present), debulking/tubularization of the tendon, and radiofrequency coblation (Figure 13). If there is a severe diseased state of the tendon and/or an element of Achilles weakness, then a flexor hallucis longus transfer is indicated. This will provide vascularity from the muscle belly of the flexor hallucis longus tendon to the Achilles tendon and provide more power to the Achilles tendon (Figure 14).

What about cortisone injections? It is not recommended to inject cortisone into a tendon due to potential rupture. The only area that is safe for a cortisone injection is in the retrocalcaneal bursa. It has been my experience that bursitis alone is the least common condition that is encountered in the realm of Achilles-associated pain. If indeed the only

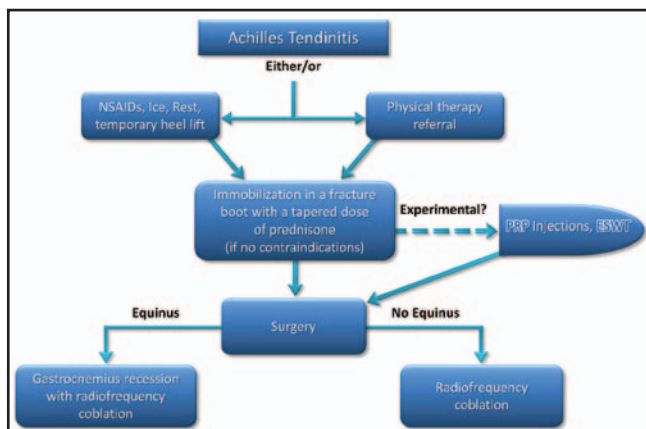


Figure 8. Treatment algorithm for Achilles tendinitis.



Figure 9. A postoperative radiograph depicting aggressive removal of a heel spur and Haglund's deformity. The large surface area of raw cancellous bone helps provide vascularity to the tendon and a suitable tenodesis area. Not only is the tendon debulked, but the heel is too.

condition is bursitis, then I will consider either oral anti-inflammatory medication or an injection of 2 mg of decadron into the bursa. Fracture boot immobilization is typically done after a cortisone injection into the bursa for minimizing stress around the tendon during this period. In cases where there is bursitis in addition to insertional Achilles tendinitis, the bursa is typically removed when the Haglund's deformity and/or posterior spur are resected.

In conclusion, careful examination of the Achilles

tendon and associated structures will uncover each of the elements of tendinitis, tendinosis, and bursitis. Although the treatments for these conditions are similar, remember tendinosis is a chronic, degenerative state of tendon and typically anti-inflammatory treatments are ineffective. It has been my experience that radiofrequency coblation works well to resolve pain associated with tendinitis and tendinosis. Finally, more often than not, the posterior bump on the heel is not bone, but rather thickened tendon (tendinosis).

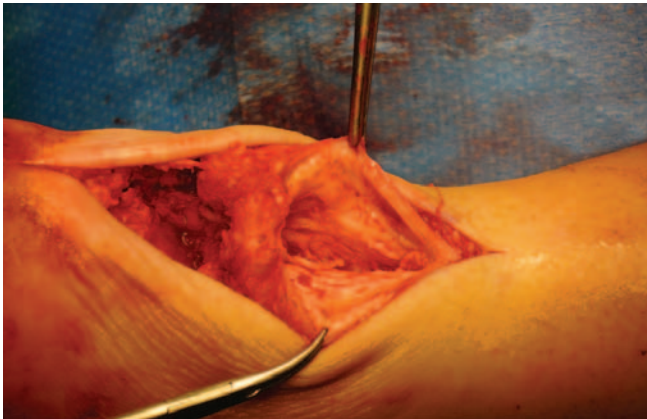


Figure 10. Intraoperative view of debulking the distal Achilles tendon.

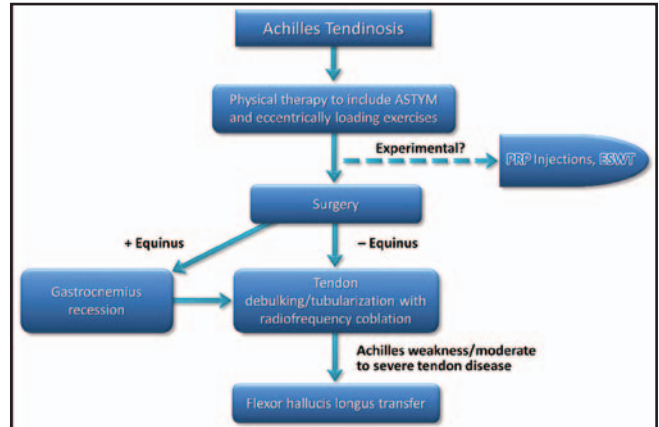


Figure 11. Treatment algorithm for Achilles tendinosis.



Figure 12. This patient had no calcaneal deformities (no spur or Haglund's). A simple radiofrequency coblation treatment resolved her insertional Achilles tendinitis.



Figure 13. Intraoperative view of a gastrocnemius recession, debulking of the tendon, and radiofrequency coblation for mid-body Achilles tendinosis.

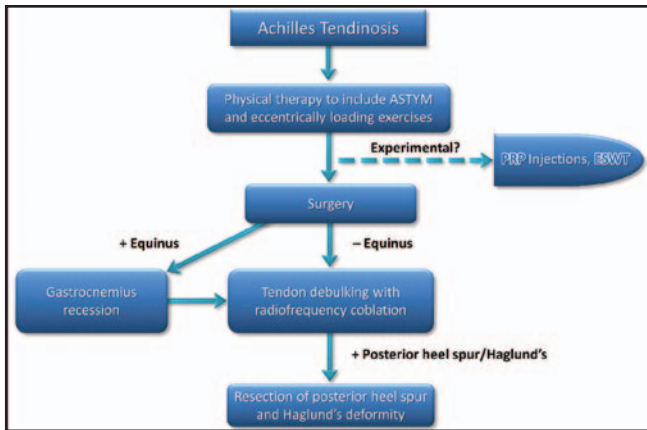


Figure 14. Treatment algorithm for mid-body Achilles tendinosis.