

POSTERIOR HEEL PAIN: Mechanical vs. Non-mechanical Etiologies

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INTRODUCTION

*The physician cannot apply the proper therapeutics
without a correct diagnosis.*

Aurelius Cornelius Celsus, 25 BC to 50 AD

Posterior heel pain is a common complaint by patients presenting to the podiatric physician. Pain in this area can be rather incapacitating and difficult to manage either non-operatively or operatively. An accurate diagnosis of the etiology of posterior heel pain is critical to planning management strategies and predicting prognosis. The diagnosis of posterior heel pain for purposes of identifying an etiology can be broken down into two broad categories: mechanical and non-mechanical. The mechanical type of posterior heel pain is primarily associated with subacute local symptoms and has a biomechanical etiology resulting in enthesopathy pain of the posterior heel region. Non-mechanical posterior heel pain may present similar to mechanical posterior heel pain but is generally more severe and acute in presentation. Non-mechanical posterior heel pain is a symptom of a more systemic disease process. When non-operative treatment of mechanical posterior heel pain fails, surgery may become an option. The purpose of this paper is to emphasize the need and discuss the methods for clinical assessment of posterior heel pain. It is important, prior to any consideration for surgical intervention of unresponsive mechanical posterior heel pain, to rule out the presence of non-mechanical posterior heel pain with a systemic etiology due to the potential impact on response to treatment and prognosis.

CLINICAL SYMPTOMS

Mechanical posterior heel pain typically involves discomfort at the insertion of the heel cord into the calcaneus posteriorly. The pain is localized primarily to the posterior heel and can potentially involve all the various soft tissues about the retrocalcaneal area. Skin lesions or skin irritation due to shoe counter pressure on bony exostosis formation at

the heel cord insertion area may be present. There may be adventitial bursal inflammation and pain subcutaneously over the posterior calcaneus or anatomical bursal inflammation between the heel cord and the calcaneus itself. A bony spur, with or without calcifications of the heel cord, may develop near the insertion of the heel cord. Such exostosis and ectopic bone formation may be part of a deep pain symptom complex of enthesopathy at the insertion of the heel cord. Tendinosis or tendinitis of the Achilles tendon can further aggravate local symptoms to the posterior heel region.

The mechanical and non-mechanical pain of the posterior calcaneus under discussion here should not be confused with Haglund's deformity of the calcaneus.(Fig. 1) Haglund's deformity is a structural or positional deformity of the posterior calcaneus resulting in a bony prominence of the posterior superior corner of the calcaneus that may extend along the lateral margin of the calcaneus posteriorly. Haglund's bony prominence of the calcaneus results in patient complaints of shoe irritation from the counter of shoes that is more superior and lateral in presentation than exostosis formation at the heel cord insertion. Enthesopathy type pain of the posterior heel area is not generally associated with an isolated Haglund's deformity presentation. Exostosis of the heel cord insertion or ectopic bone within the heel cord may be a coincidental radiographic and clinical finding combined with a Haglund's deformity, but each is a separate and distinct clinical entity and should not be confused.(Fig. 2)

Non-mechanical posterior heel pain may present similar to mechanical posterior heel pain. Local clinical symptoms involving the soft tissues of the posterior heel may be present as noted in mechanical heel pain. The clinical presentation of non-mechanical posterior heel pain is typically a more inflammatory type of presentation than that noted in mechanical posterior heel pain. The erythema, edema, and induration about the posterior calcaneus is more exaggerated in presentation. The local tenderness and pain to the area may be of a more acute presentation.

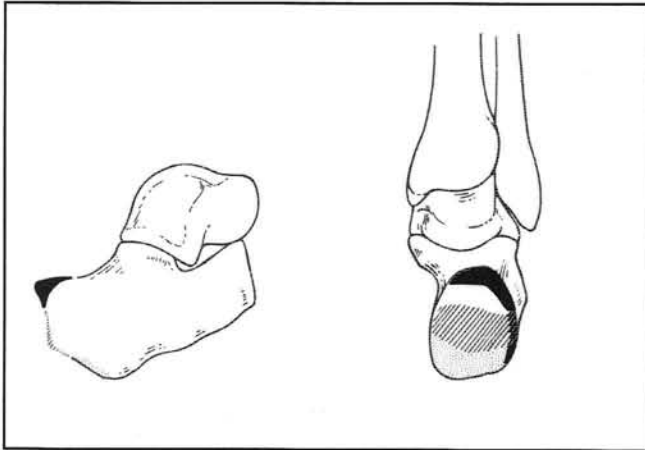


Figure 1A. Haglund's deformity with more superior and lateral bony prominence and little involvement of the insertion of the heel cord.

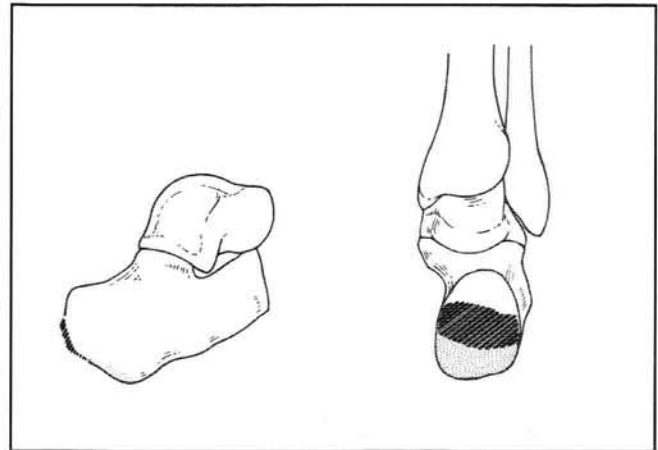


Figure 1B. Diagram of posterior exostosis with a more inferior bony prominence when present and significant involvement of the insertion area of the heel cord.



Figure 2A. Misdiagnosis of posterior exostosis. Preoperative lateral heel radiograph of suspected Haglund's deformity.

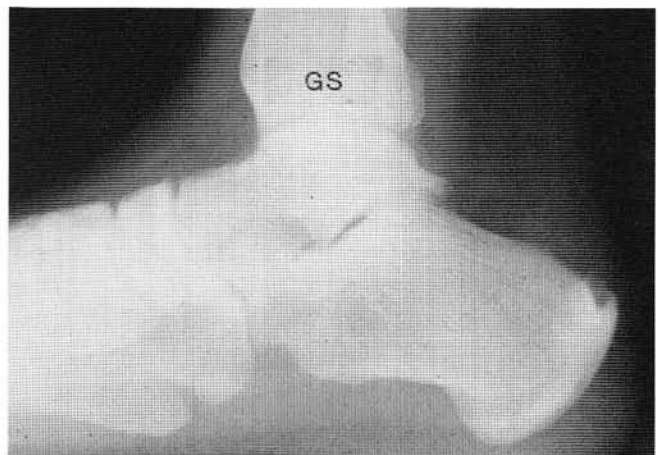


Figure 2B. Postoperative lateral heel radiograph following resection of Haglund's deformity with continued enthesopathy type posterior heel pain

DIAGNOSIS

Mechanical posterior heel pain generally presents as pain of a more sub-acute nature about the posterior calcaneal region than non-mechanical posterior heel pain. The pain may be noted with activity after rest or post-static dyskinesia in character as is commonly associated with plantar heel pain or fasciitis. The pain may be worsened with stance and activity that stresses and stretches the heel cord. The pain is rather localized to the posterior calcaneus and specific tissues may be identified as involved in the painful process. The presentation is non-inflammatory or low-grade inflammation in nature. (Figs. 3A, 3B) A foot or leg biomechanical etiology to the posterior heel pain is often identifiable. Varus or valgus foot types have been associated with non-mechanical

posterior heel pain. Triceps or gastrocnemius equinus, either as a primary deforming force or as a response to guarding from posterior heel pain, is often present. Laboratory studies are not available to aid or confirm a diagnosis of mechanical posterior heel pain, but can be utilized to rule out more systemic etiologies.

Non-mechanical posterior heel pain may present similar to mechanical posterior heel pain. The clinical symptoms are generally far more exaggerated and inflammatory in nature. More acute and generalized type discomfort of the posterior heel may be noted as well as edema, induration, and palpable calor or erythema. (Fig. 3C) The clinical symptoms of non-mechanical posterior heel pain can be more paroxysmal in presentation. They are not necessarily related to activity. They may not be noted following



Figure 3A. Clinical presentation possibilities of posterior heel pain, Haglund's deformity.

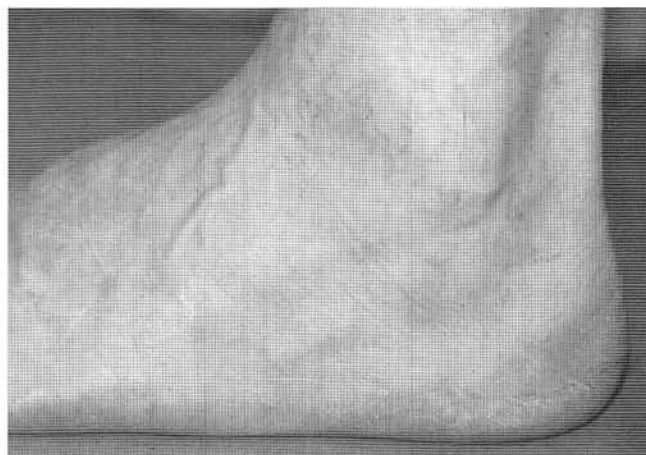


Figure 3B Mechanical posterior heel pain associated with a posterior exostosis with Achilles tendinosis.

rest or after exaggerated activity. They may seem to present episodic in nature and come and go in unpredictable episodes. They are far more inflammatory in nature and more severe and may be noted with good mechanical foot structure.

Of importance is the presence of certain systemic clinical signs and symptoms beyond the heel region. Inquiries concerning such possibilities as nail dystrophy or skin lesions as may be noted with psoriasis can be revealing. Associated lumbar spinal or hip pain of the sacroiliac area are important to discern from the patient. Discussions concerning urethritis or inflammation with pain on urination as well as gastrointestinal symptoms of gastritis or colitis are important to note. The seronegative spondyloarthropathies are the primary non-mechanical diseases associated with posterior heel pain. These diseases include Reiter's syndrome, ankylosing spondylitis, psoriasis, and ulcerative colitis. Rheumatoid arthritis may be concurrent with non-mechanical posterior heel pain. The crystalline arthropathies of gout and pseudogout have been associated with inflammation at or near the insertion of the heel cord. Diffuse idiopathic skeletal hyperostosis (DISH) is a possible consideration if generalized exostosis formation at multiple enthesopathy points presents in addition to the posterior heel area. Laboratory studies may be utilized to diagnosis a systemic disease process and are considered due to the systemic nature of non-mechanical posterior heel pain.



Figure 3C. Non-mechanical posterior heel pain associated with rheumatoid arthritis.

RADIOGRAPHIC EVALUATION

The typical radiographic presentation of a patient with mechanical posterior heel pain is spurring within or near the insertion of the Achilles tendon. The posterior calcaneus has an "added on" appearance of extra bone. (Figs. 4A, 4B) The normal contour of the cortex of the posterior calcaneus may be evident beneath the bony spur formation near the heel cord insertion. Additional bone appears to have been added to the posterior calcaneus near the

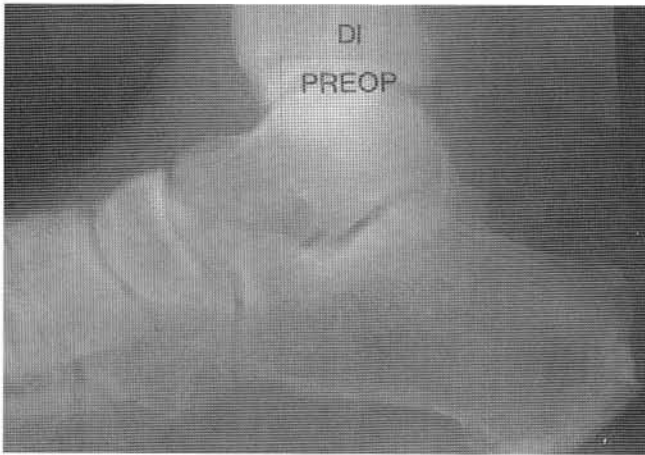


Figure 4A. Lateral heel radiographic presentation of posterior heel pain. Haglund's deformity.

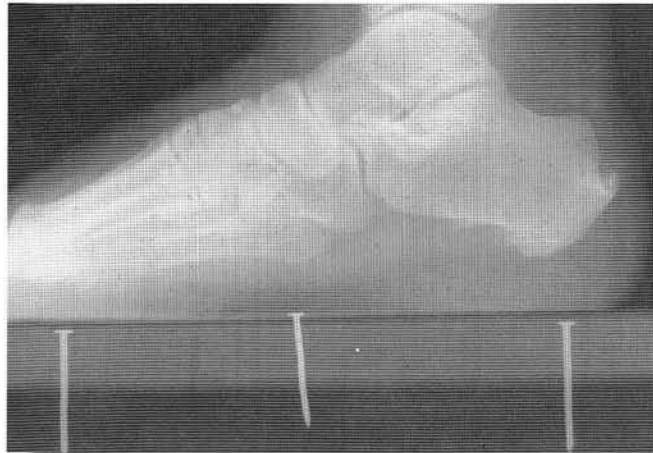


Figure 4B. Mechanical posterior heel pain associated with a posterior exostosis.

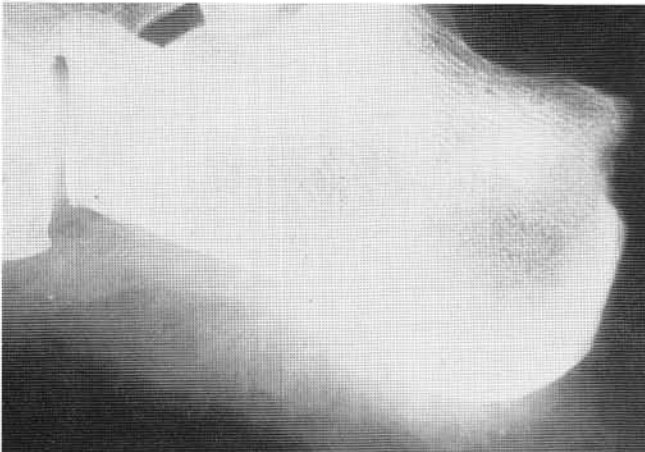


Figure 4C. Non-mechanical posterior heel pain associated with rheumatoid arthritis.

heel cord insertion area. The remaining structure of the calcaneus is typically unremarkable. Soft tissue induration and edema of the posterior calcaneus may be noted but is generally minimal. The radiographs of the calcaneus may also be normal in appearance with no exostosis formation evident.

The typical radiographic presentation of non-mechanical posterior heel pain is more of a "taken away" appearance. (Fig. 4C) Punched out lesions may be noted about the posterior calcaneus. The cortical margin of the posterior calcaneus appears to be violated or indented. The "add-on" appearance of the hypertrophic presentation is not noted. If a combination of additional bone formation as well as erosive changes are noted, typically a non-mechanical type etiology is more likely present. The radiographic appearance of the calcaneus coupled with the other clinical symptoms and

signs, help build a picture of mechanical versus non-mechanical etiologies for posterior heel pain. No particular absolutes are noted.

MANAGEMENT

The management of mechanical posterior heel pain first involves an accurate diagnosis. Most posterior heel pain is mechanical in etiology. Treatment for non-mechanical and mechanical posterior heel pain at the early stages is similar. Initially, non-steroidal anti-inflammatory medications along with immobilization and physical therapy are attempted. Any biomechanical abnormalities of the foot or leg may be compensated with foot orthoses or shoe modifications. The treatment should be rather aggressive and include both rest of the tendon insertion complex as well as measures to reduce inflammation. If adequate relief with this level of treatment is not obtained, then consideration may be given for more formal below-the-knee cast immobilization or oral steroids as a second level of management. If persistence of pain is noted in the presence of a significant bony prominence of the posterior calcaneus or calcifications are present within the heel cord itself, operative intervention to remodel the posterior calcaneus is not an unreasonable consideration when non-operative measures have failed to result in adequate relief.

The treatment of non-mechanical posterior heel pain is initially very similar to mechanical heel pain. If clinical symptomatic response is not appreciated after these measures, then careful re-evaluation and possible consultation with the internist or rheumatologist may be necessary to help

confirm a diagnosis of non-mechanical heel pain. Disease modification and remittive drugs or DMARDS may be a consideration to manage the systemic disease which should result in relief of the posterior heel pain. Surgical options are a consideration if non-operative care lacks adequate clinical response. Surgical intervention should be carefully considered, as the prognosis may be poorer in non-mechanical types of posterior heel pain. The disease causing the posterior heel pain is not eliminated with posterior heel operative intervention, only the local clinical symptoms of the disease presence.

CONCLUSION

The evaluation and management of posterior heel pain can be rather complex. Typically mechanical posterior heel pain will eventually respond to non-operative care. Lack of appropriate response to treatment may be an indication that non-mechanical posterior heel pain may be present. A thorough re-evaluation of the patient with a diagnosis possibility of non-mechanical posterior heel pain should be entertained. Further reassessment of the patient concerning clinical symptoms and signs associated with non-mechanical posterior heel pain should be reviewed in detail. If a diagnosis of non-mechanical posterior heel pain is suspected, further testing and evaluation along with medical consultation may be

necessary prior to any consideration for surgical intervention. The surgical intervention of mechanical posterior heel pain is difficult at best for complete relief of pain and clinical symptoms. The symptomatic relief following surgical intervention for non-mechanical posterior heel pain cannot be expected to be as complete as with mechanical heel pain due to the systemic etiology of the syndrome. Careful evaluation, management, and diagnosis of this condition is necessary to help provide adequate symptomatic relief as well as prognosis for the treatment programs employed.

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