

## ATYPICAL HEEL PAIN

*M. Jay Groves, IV, D.P.M.*

Heel pain is one of the most common conditions evaluated by the foot and ankle specialist. It is estimated that 15% of adults have biomechanical plantar heel pain or heel spur syndrome. Variants of mechanical heel pain include plantar fasciitis, heel spur syndrome, inferior calcaneal bursitis, and prominent plantar protrusion. While the most common etiology of heel pain is biomechanically based, several other causes exist which need to be considered when evaluating heel pain (Table 1). The purpose of this paper is to describe the evaluation of patients with atypical (non-biomechanical) heel pain.

**Table 1**

### NON-BIOMECHANICAL CAUSES OF HEEL PAIN

- I. Metabolic
  - A. Arthritides
  - B. DISH
  - C. Hypertrophic osteoarthropathy
  - D. Paget's disease of bone
  - E. Crystal deposition disease
  - F. Sarcoidosis
  - G. Sickle cell disease
- II. Infection
- III. Vascular
- IV. Trauma
- V. Neurologic
  - A. Entrapment
  - B. Peripheral neuropathy
  - C. Radiculopathy
- VI. Neoplasm
  - A. Primary
  - B. Secondary

### EVALUATION

The patient's history and physical provide initial evidence of atypical heel pain. Frequently, patients with atypical pain describe the symptoms of classic heel spur syndrome, however, they also relate unusual or inconsistent symptoms, with uncommon sites of pain. The patient's chief concern and history of present illness (HPI) are the initial reference points in evaluating atypical heel pain. When compiling the HPI, documentation of the type, quality, exact location, onset, length, and progressive nature of the heel pain are essential. Perhaps the most important element of the HPI is the history of previous treatment and response to that treatment, because most often it is the lack of response to conservative heel spur syndrome treatment that indicates a diagnosis of unusual causes of heel pain. The HPI should also detail any previous heel trauma, infection, and surgery so that related heel pain can be identified.

The patient's past medical history, review of systems, and history of hospitalization will also be helpful in evaluating the etiology of atypical heel pain. Metabolic heel pain associated with autoimmune disease, sickle cell disease, the arthritides, crystal deposition disease, etc. will require systemic treatment in addition to local care. Because the calcaneus is the most common site for metastasis (as well as primary bone tumor) in the foot, the history of prior or recurrent visceral, bone, skin, or other neoplasm should be determined. Finally, systemic vascular and neurological etiologies of heel pain are often gleaned from the past medical history and review of systems.

Physical examination of atypical heel pain should focus on identifying the most painful site, and the primary structures involved. The exam begins by visually noting erythema, edema and the presence of lesions or cicatrices about the heel. The foot is also assessed for apparent spasm. Next, the foot is palpated beginning away from the most painful site and progressing toward this location. The presence of neuritic radiation with percussion

of pedal nerves is documented. The calcaneus is specifically compressed with medial and lateral pressure, and palpated posteriorly and inferiorly. The plantar fascia, accessible tendons, sinus tarsi, and edematous sites are also palpated.

Finally, range of motion is then evaluated for all pedal joints. The patient's ability to flare the lesser digits, particularly the fifth, will help determine entrapment of the first branch of the lateral plantar nerve. Muscle strength is graded by placing the patient's foot in the position of strength for the corresponding muscle group, and manually testing the muscle.

Plain radiographs should also be performed upon initial examination to assess osseous structures. The presence of disrupted cortex, sclerotic lines, structural/architectural changes, or overt tumor will hasten the diagnosis. The lateral foot radiograph will provide the most significant information. Calcaneal, axial, and Harris-Beath views may also be helpful. All radiographs need to be scoured under magnification and heat lamp to uncover subtle changes. Radiographs may be initially described as negative for osseous pathology. However, when re-evaluated after the final diagnosis is made, the original radiographs may suggest the primary pathology (Fig. 1A).



Figure 1A. Initial visit radiograph. This patient was treated for heel spur syndrome for three months.

Treatment is based upon the etiology of heel pain. If an atypical source is not identified, patients are usually treated for heel spur syndrome with a protocol consisting of biomechanical control, non-steroidal anti-inflammatories, physical therapy, and local steroid injection therapy. Unresponsive patients with worsening pain, odd symptoms, or an unusual physical exam should be studied further.

The final workup of patients with atypical heel pain involves laboratory tests, special imaging, and ultimately biopsy. An arthritis profile, CBC and Chem-22 are necessary laboratory tests to initially evaluate systemic causes of resistant heel pain.

EMG-NCV can help identify possible neurological causes of heel pain. Special imaging, including bone scans, CT and MRI are used to evaluate bony and soft tissues (Fig. 1B). If a definitive or presumptive diagnosis cannot be appropriately made, then calcaneal bone biopsy will provide definitive diagnosis (Figs. 1C, 1D). Soft tissue biopsy may also be required. Specimens should be sent for histopathologic examination and bacterial culture.

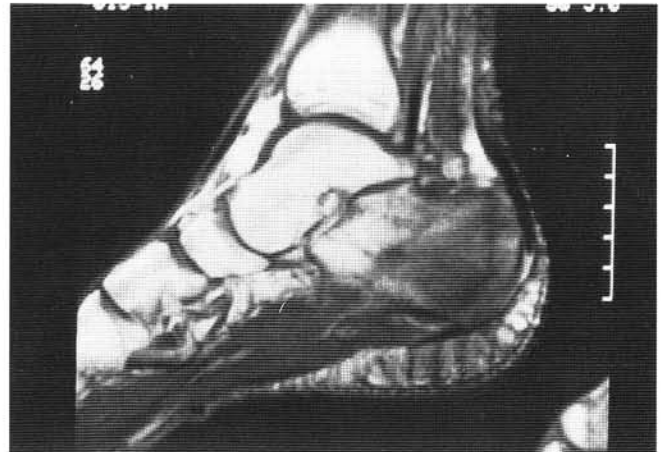


Figure 1B. T1-weighted MR image of same patient. Note decreased signal intensity and presence of calcaneal fracture. Infection could not be ruled out since the patient had been admitted for same leg cellulitis.



Figure 1C. Calcaneal trephine biopsy of the same patient. Calcaneal biopsy is usually performed posterior and inferior to the peroneal tendons and sural nerve.



Figure 1D. Lateral radiograph, two months after stress fracture diagnosis. Note sclerotic line posterior to the posterior facet representing fracture healing. The patient had been non-weight bearing for six-weeks.

### CONCLUSION

Heel pain is of the most common ailments evaluated by the foot and ankle specialist. Atypical heel pain is rare, however, it usually has components of classic heel spur syndrome thereby delaying the eventual diagnosis. Atypical heel pain is often dependent on the past medical history, and the etiology will usually be discovered by investigating the review of systems and history of present illness, as well as performing a thorough physical exam. Ultimately, special studies and biopsy may be necessary. The etiology of heel pain needs to be determined so that effective treatment may be instituted for these patients.

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