CHAPTER **3**

LATERAL PAIN SYNDROMES OF THE FOOT AND ANKLE

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The majority of patient encounters with the podiatrist are secondary to pain in the foot and/or ankle. If we draw an imaginary line bisecting the lower leg and extending distally to the third toe, pain in the medial aspect of the foot and ankle is typically straight forward. There is a predominance of medial heel pain, which is usually plantar fasciitis. Medial arch symptoms are seen frequently in the pes valgus foot type such has posterior tibial tendinitis. Less frequently one may see tarsal tunnel syndrome. First ray pain syndromes are typically associated with hallux valgus or hallux limitus; and finally, degenerative joint disease is frequently seen in the medial column and the second tarsometatarsal joint. Evaluation and diagnosis of these disorders can typically be done without much ambiguity.

It has been my experience that pain in the lateral foot and ankle presents challenges in clinical diagnosis. If one draws a silver dollar sized circle on the lateral ankle (Figure 1), one can appreciate the significant number of structures that can be pathologic, which are in close proximity to one another. Moreover, one can appreciate that there is overlap in potentially pathologic structures when doing a palpatory examination. These structures include the fibula, lateral ankle gutter, lateral ankle ligaments, the sinus tarsi, and the peroneal tendons.

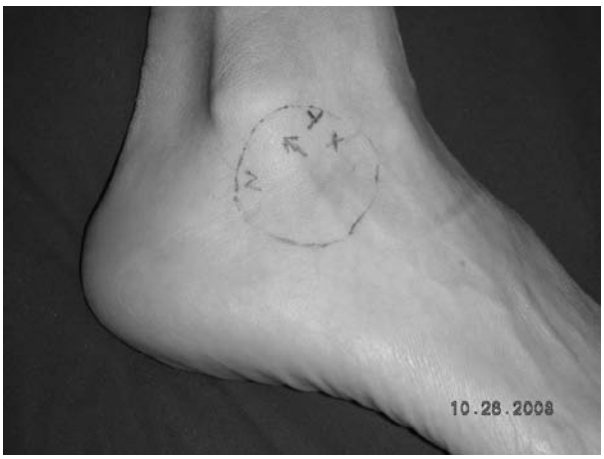

Figure 1. Clinical photograph depicting the close proximity of multiple anatomic sites. X = sinus tarsi; Y = anterior talofibular ligament; arrow = impingement site (talofibular joint); Z = peroneal tendons.

An area the size of your thumb can encompass many of these structures.

Distally in the foot, pain seems to affect the lateral 2 metatarsals and in the region of the styloid process of the fifth metatarsal. When evaluating pain juxtaposed to the fifth metatarsal base, one is usually dealing with peroneal tendon pathology. If the pain is directly on the styloid process, then this is usually what I term an insertional peroneus brevis tendinitis. The other common area of pain will be in the cubital tunnel, which is where the peroneus longus tendon will traverse under the cuboid. Often a radiograph will reveal an os peroneum. When there is pain with palpation between the cuboid and the fibula, then one should be concerned about peroneal tendinosis, especially if there is any edema in the area. Peroneal tendinitis may be noted in the retromalleolar region of the fibula. Also, the syndrome of subluxing peroneal tendons may be in this area. Stenosing peroneal tendinitis can be seen inferior to the tip of the lateral malleolus, more commonly seen in the pes cavus foot type. Pain on the dorsolateral foot overlying the bases of the fourth and fifth metatarsals is a stress syndrome that I term periostitis of the metatarsals.

In this article, I will break down the different elements of diagnosis and treatment. This information is based on my clinical experience and will hopefully provide a more systematic way to approach pain syndromes of the lateral foot and ankle.

STRESS FRACTURE OF THE FIBULA

Stress fractures of the fibula are typically seen in 2 patient populations. Fatigue stress fractures are seen in the athlete who is running and insufficiency stress fractures in the older patient with osteoporosis. Diagnosis of the stress fracture is relatively straight forward. Typically, there will be significant edema, erythema, and warmth over the distal fibula. Always compare both extremities to assess for subtle edema. Pain will be noted with palpation of the fibula. Radiographs will usually reveal the stress fracture as

Figure 2. Radiograph of a stress fracture of the fibula. Note callus formation.

a transverse fracture in the diaphyseal-metaphyseal region of the bone (Figure 2). Magnetic resonance imaging (MRI) is rarely necessary even with an initial negative radiograph. Remember, there may be a 3-week lag period of onset of symptoms and radiographic evidence of a fracture. Typically on subsequent serial radiographs, bone callus will be evident. Treatment of this condition includes fracture boot immobilization, compression, and icing. Since the fibula is a nonweight-bearing bone, and these fractures are stable, nonweight bearing is unnecessary. One can consider a bone growth stimulator to enhance bone healing especially in the patient with associated risk factors such as obesity, smoking, osteoporosis, and/or diabetes.

LATERAL ANKLE LIGAMENT DERANGEMENT AND OSTEOCHONDRAL LESIONS OF THE TALUS

Disorders of the lateral ankle ligaments will generally result in 2 main patient complaints consisting of pain and instability. Some patients only have pain or vice versa, and some patients will have both. I find it helpful to determine which of the 2 symptoms are worse. If instability is the primary concern, then treatment is straight forward. Assuming that the clinical examination is consistent with ankle instability, with a positive anterior drawer and talar tilt tests, then treatment will involve bracing techniques, physical therapy, and/or surgical repair. If pain is the main concern, then things are more difficult because there may be other causes of pain. MRI is helpful in this scenario to rule out other causes of pain such as lateral talar osteochondral lesions.

Often, patients will have concomitant pathologies of ligament rupture and osteochondral lesions of the talus. If the MRI is remarkable for lateral ankle ligament derangement and negative for other pathologies, then treatment can be instituted to stabilize the ankle conservatively or with surgery. If however, there is an osteochondral lesion in addition to ligament pathology, then one has to determine if both are contributing to pain or one or the other. One thing to consider with osteochondral lesions is that many lesions are old and/or asymptomatic. Lateral osteochondral lesions are usually secondary to an injury, so we want to get that information from the patient. MRI can reveal how much bone marrow edema is present under the lesion. If significant, then more likely than not, the lesion is playing a role. Diagnostic injections into the lateral ankle are of limited benefit because there will be improvement with both pathologies. If however, there is any concern of sinus tarsi syndrome, then a sinus tarsi injection with local anesthesia can rule out that potential source of pain.

When it comes to surgical repair of the unstable ankle, I will generally do a Brostrom technique. Using the standard incision for ligament repair, one can access the lateral shoulder of the talus where the majority of osteochondral lesions are located. Plantarflexion of the foot will usually allow you to see the cartilaginous defect. Debridement of the cartilage defect and subchondral drilling is performed followed by the ligament repair. At 1 week postoperative, I will have the patient start ankle joint active range of motion avoiding any inversion/eversion maneuvers to protect the ligament repair. At 3 weeks, the patient will start weight bearing in a fracture boot and return to shoes at the 6 week anniversary of surgery. Physical therapy is commenced at this point as well.

PERONEAL TENDON PATHOLOGY

There are 3 anatomic areas of the foot and ankle where the peroneal tendons will have pathology. Proximal to the tip of the lateral malleolus is where one may encounter subluxing peroneal tendons or tenosynovitis. The former is usually associated with a traumatic event to the ankle and the latter is usually due to an over-use injury. The region between the tip of the fibula and the fifth metatarsal base is where ruptures occur and more commonly will have tendinosis, a chronic degenerative state of tendon with interstitial tears, and bulbous hypertrophy. Finally, pain that is located near the fifth metatarsal base is generally a tendinitis/enthesopathy. MRI is useful if one is

concerned about tendinosis. Conservative treatments are rarely helpful for tendinosis and will generally require a surgical intervention.

There is a favorable prognosis with conservative treatment for peroneal tendinitis that generally will include some combination of anti-inflammatory medication, immobilization, physical therapy, and orthoses. A word of caution with cortisone injections is prudent in peroneal pathology. One may consider a cortisone injection into the cubital tunnel for localized pain that does not respond to other treatments. The injection into the cubital tunnel is inferior to the peroneus brevis tendon. For other areas along the course of the tendons, unless the patient will be immobilized, I will not consider a cortisone injection. I have seen too many tendon ruptures in this area after cortisone injections (Figures 3 and 4).

SINUS TARSI SYNDROME

This is one of those disorders that nobody really knows exactly what it is, but it can be successfully treated. Diagnosis of sinus tarsi syndrome is straight forward. When there is pain in the sinus tarsi on palpation and symptoms resolve after injection of local anesthetic, one can be confident with the diagnosis even without further testing. Certainly radiographic evaluation is necessary to assess for advanced arthritis of the subtalar joint. MRI can be done to exclude other pathologies. My personal opinion is that sinus tarsi syndrome is a synovitis whether it is a chronic condition caused by mechanical influences of the pes valgus foot type or some kind of acute inversion injury.

Instability of the subtalar joint has been postulated as a source of apparent ankle instability. If there is disruption of the talocalcaneal ligaments and the cervical ligament, then it seems likely that like the ankle, this can contribute to instability. It is difficult to make a clinical call on subtalar joint instability. Stress testing of the subtalar joint is difficult to do without influence of the ankle joint. My personal opinion is that if the talar tilt test is equivocal and the anterior drawer test is positive for laxity, then it is generally ankle ligament instability. Conversely, if the anterior drawer test seems normal and the talar tilt test is not, then subtalar joint instability may be playing a role. We know that in ankle sprains, it would be unlikely that the calcaneofibular ligament ruptures leaving an intact anterior talofibular ligament.

If instability of subtalar joint plays a clinical role, then why aren't there reports of instability following sinus tarsi decompressions that involve excision of the entire contents including the ligaments? It would seem likely that everybody who had a sinus tarsi decompression would have symptoms of instability postoperatively, however that does not seem to be the case.

Treatment of sinus tarsi syndrome will typically involve oral anti-inflammatory medications, cortisone injections, physical therapy, and/or biomechanical control with orthotic devices. In cases of arthritis, subtalar arthrodesis may be necessary. Sinus tarsi decompression may be of benefit in recalcitrant cases. In confirmed instability of the subtalar joint, a split peroneus longus tenodesis ankle stabilization procedure may be a good approach as the 2-ligament repair will also cross the subtalar joint. Therefore, both the ankle and subtalar joints are stabilized.

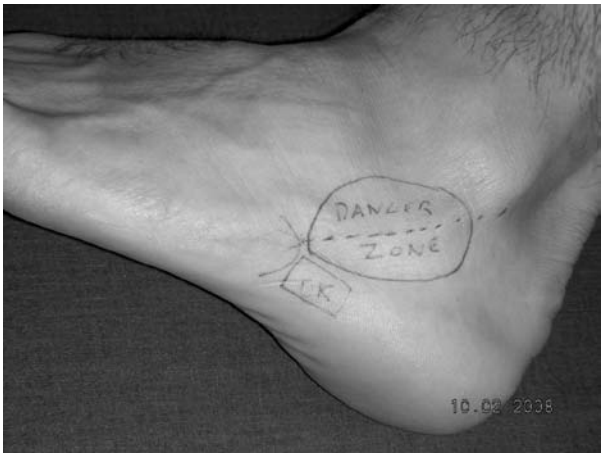

Figure 3. Clinical view of the area of the foot that cortisone should be avoided (danger zone) and a safe area for cortisone in the cubital tunnel (OK). The dashed line represents the peroneal tendon course.

Figure 4. Intraoperative view that depicts a partial rupture of the peroneus brevis tendon. There is calcification within the tendon. This patient had prior cortisone injections in this area.

IMPINGEMENT OF THE TALOFIBULAR JOINT

Another source of lateral ankle pain may be an impingement between the fibula and talus in the lateral ankle gutter (Figure 5). In this syndrome, pain is usually well defined at the tip of the fibula. A lesion marker at the site of pain may help with radiographic interpretation. If the palpatory examination reveals pain not only on the tip of the malleolus, but also in the gutter and anterolateral ankle joint, then consider an MRI for assessment of an osteochondral lesion (Figure 6). A diagnostic injection of local anesthesia may aid in the diagnosis especially with ruling out other sources of pain. Treatment will usually require surgical intervention, which can be done arthroscopically or through an open approach. Conservative treatments will typically involve biomechanical control with orthotics.

PERIOSITIS OF THE METATARSALS

Pain in the dorsolateral foot overlying the bases of the fourth and fifth metatarsals is usually a stress syndrome (Figure 7). Patients will complain of a sharp stabbing pain or a dull ache upon activity. Aggravating symptoms include barefoot walking or wearing flimsy shoes. In my practice, I see more of this problem in the summer when people are wearing flip flops and and/or going barefoot around the house. Treatment involves anti-inflammatory medication, wearing supportive stiff soled shoes, and orthotics. Surgery is usually unnecessary as this problem generally gets better with nonoperative therapies. The notable exception would be the patient that presents with these symptoms and there is an underlying compound deformity of the foot, such as the equinovarus foot, contributing to excessive stress.

COMMON DENOMINATOR IN LATERAL PAIN SYNDROMES

When we carefully look at the common link with most of these lateral pain syndromes, the cavus foot and metatarsus adductus foot type are typically seen. The notable exception is sinus tarsi syndrome, which is seen more often in the pronated foot type. The high arched foot is vulnerable to lateral ankle injuries especially if there is a forefoot valgus. The metatarsus adductus foot type will be a lateral over loader in gait, which will contribute to periostitis of the metatarsals and peroneal tendon pathology. Lateral ankle bony impingement is most likely a due to repetitive strain and stresses on the lateral ankle joint and/or acute injuries resulting in avulsions that heal causing exostoses. When reviewing cases of Jones fractures and avulsion fractures of the fifth metatarsal, more often than not, these patients have a component of metatarsus adductus (Figures 8 and 9).

Figure 5. Radiograph of an ankle illustrating an osseous impingement of the talofibular joint as well as a suspicious looking lateral shoulder of the talus. This patient had chronic lateral ankle pain that upon examination revealed pain in the anterolateral gutter of the ankle and on the inferior aspect of the fibula.

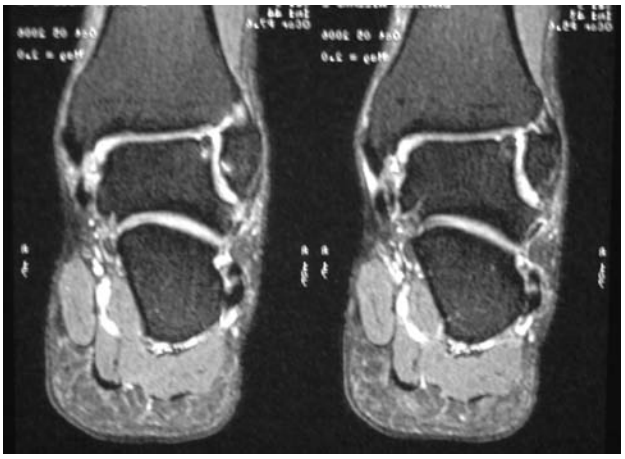

Figure 6. MRI of the same patient in Figure 5. Note the talofibular impingement and osteochondral lesion of the lateral shoulder of the talus.

Figure 7. Radiographs of a patient who underwent cavus foot reconstructive surgery. Note that there is cortical hypertrophy of the fourth and fifth metatarsals. This is consistent with lateral overloading of the foot that can cause dorsolateral foot pain.

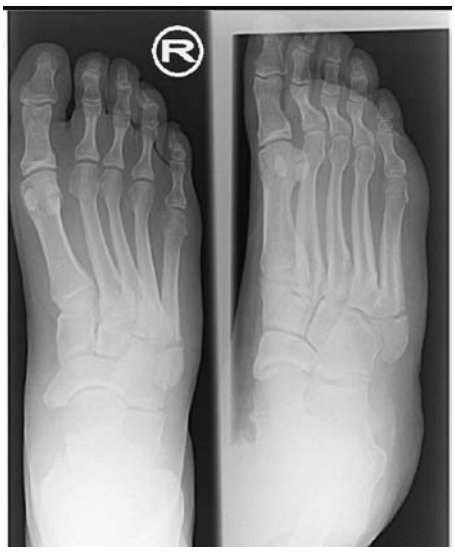

Figure 8. Radiograph of an avulsion fracture of the fifth metatarsal. Note the underlying metatarsus adductus.

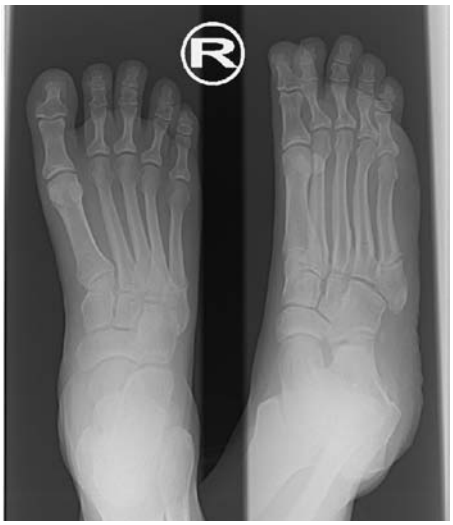

Figure 9. Radiograph of a Jones fracture. Note the underlying metatarsus adductus.

Figure 10. MRI illustrating a stress fracture of the cuboid. This is a less common source lateral foot pain.

When a patient presents to the office with lateral ankle and/or hind foot complaints, diagnosis is more difficult than medial complaints due to the proximity of anatomic structures of joints, ligaments, and tendons. Careful interpretation of symptoms including pain and instability in conjunction with a thorough clinical examination is paramount. The examination should include careful palpatory and range of motion maneuvers, laxity testing of the ankle, manual muscle testing of the peroneals, diagnostic anesthetic injections, radiographs and MRI if necessary. MRI is generally used as a confirmatory study as we typically know what is wrong and want to rule out other less common pathologies (Figure 10).

For these clinically challenging cases, I find it particularly helpful to examine patients multiple times. Subsequent examinations on a patient with a complicated case make the clinical diagnosis clearer. I always reevaluate a patient after an MRI so that I can focus on MRI

pathology and confirm clinical correlation. Remember, we do not treat radiographs/MRIs. I have found that peroneal pathology such as split tears are very common in older patients, but many times do not clinically correlate with the patient's symptoms. Once the clinical diagnosis is made, effective treatment can be instituted.

Surgery is typically considered for lateral ankle instability with pain, osteochondral lesions of the talus, impingement syndromes, and tendinosis of the peroneal tendons. Conservative care is usually successful in the treatment of periostitis, stress fractures, acute tendinitis, sinus tarsi syndrome, and acute ankle sprains. For orthotic management in the cavus foot type, I will typically try to address the forefoot valgus with a first ray cutout and a dancer's pad. A valgus wedge on the orthotic device may also be of benefit to reduce lateral foot strain.

I have some final thoughts on the subject of reconstructive surgery. When conservative care is not satisfactory for the patient, then one needs to consider surgical intervention. I think it is important to determine the biomechanic reason for the underlying pathology. For example, in the case of a rigid pes cavus deformity with the chief complaint/diagnosis of lateral ankle instability and peroneal tendinosis, the repair of the tendon and ligaments may not be prudent in the long run. This is one of those scenarios when a long discussion with your patient is necessary to explain why the problem started and why merely repairing the "defects" may not prevent recurrence. It may seem aggressive or overkill to the patient to suggest a Dwyer calcaneal osteotomy, DFWO of the first metatarsal, along with lateral ankle ligament repair, for a "weak ankle." In a nutshell, this is what makes the podiatrist special, not only fixing a problem (i.e., a torn tendon), but assessing the biomechanics of the lower extremity and incorporating that into the overall treatment plan.