

TEACHING TECHNIQUES

Ankle and Foot Treatment with Prolotherapy

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INTRODUCTION

My ankle hurt A LOT immediately! I had gone up to block the spike and came down on the foot of the spiker (who followed through under the net!). The ankle quickly swelled and the throbbing pain prevented me from sleeping at all that night. I had severely sprained the lateral ligament complex while playing my favorite sport, volleyball. I quickly began a series of Prolotherapy treatments on my own ankle. It went like this (initially). I sprained my ankle on Thursday night. On Friday morning I treated the ankle with Prolotherapy. By the following Thursday it felt good and the swelling was down, I played volleyball Thursday night which led to swelling and pain again (you think?). I repeated this scenario for about six treatments before pausing to consider why I wasn't getting better, like my patients did with Prolotherapy!

It didn't take much reflection to realize I wasn't "avoiding strenuous exertion of the treated body area," which is my standard advice to the Prolotherapy patients I treat (along with "Be active, as long as it feels good."). I love volleyball and it was difficult, but I gave up my Thursday evening recreation while treating myself weekly (I was in a hurry) with Prolotherapy. After six treatments and two and a half months I returned to my beloved volleyball without pain or swelling!

It has been 15 years since my ankle was restored by Prolotherapy. Since then I have done any recreational activity without pain or swelling of my ankle! Currently, I hike, water and snow ski, snow shoe, and cross country ski without pain or swelling!

The ankle is a small but important joint. Injuries to the ankle are the most common orthopedic injuries in sports, especially volleyball, basketball, football, and jogging.

So we see many patients with ankle pain/sprain. In this article, we will look at the treatment of ankle and foot injury with Prolotherapy.

Prolotherapy treatment of the ankle and foot is very successful. It takes an average of four to six treatments, spaced two to six weeks apart, to achieve full healing.

ANKLE

Arthritis: There are two primary joints at the ankle: the ankle joint proper, and the sub-talar joint. I almost always treat them both when either one is involved. Ankle arthritis can be set up by repeated severe sprains and the ensuing instability. Osteoarthritis is another common cause of ankle arthritis. Identify the ankle joint by feeling anteriorly while flexing and extending the foot at the ankle. Feel for the dorsalis pedis artery so the injection can be given lateral or medial to it (and the accompanying anterior tibial nerve). Cleanse the skin, extend the ankle to open up the joint, then insert a 25G, 1.5-inch needle. Inject 3-4cc of 25% dextrose directly into the joint. (See Figure 1.) After withdrawing the needle, repeatedly flex and extend the joint to distribute the proliferant throughout the ankle joint. HGH may be added to the Prolotherapy solution if the joint is severely degenerated.



Figure 1. Prolotherapy injection to the ankle joint.

The sub-talar joint is readily identified as a palpable depression about 1 cm anterior and distal to the lateral malleolus. It is opened up by extending and internally rotating the foot at the ankle. (See Figure 2.) The skin is again cleansed, and a 25G 1.5-inch needle is inserted into the joint. Three to 4cc of 25% dextrose are injected and the needle withdrawn. The joint is flexed and extended several times to distribute the fluid throughout the sub-talar joint. As with the ankle joint, HGH may be added depending on the clinical indication.

Lateral: The lateral ligament complex is all too easily sprained. The lateral ligament complex is weaker than the medial, resulting in ankles being sprained laterally much more commonly than medially. The anterior talofibular is the most common injury at the ankle, usually at the fibular attachment. Examine carefully for injury to each of the major ligaments extending from the distal fibula (anterior and posterior talofibular, and the calcaneal-fibular ligaments). (See Figure 3.) Also, check the calcaneo-cuboid ligament 1 cm proximal and above the fifth metatarsal prominence laterally. This ligament is often injured along with the sprain to the lateral ankle.

Place a double paper towel under the foot. Cleanse the area to be treated. A 10cc luer lock syringe is filled with standard Prolotherapy solution and fitted with a 25G



Figure 2. Prolotherapy injection of the sub-talar joint.

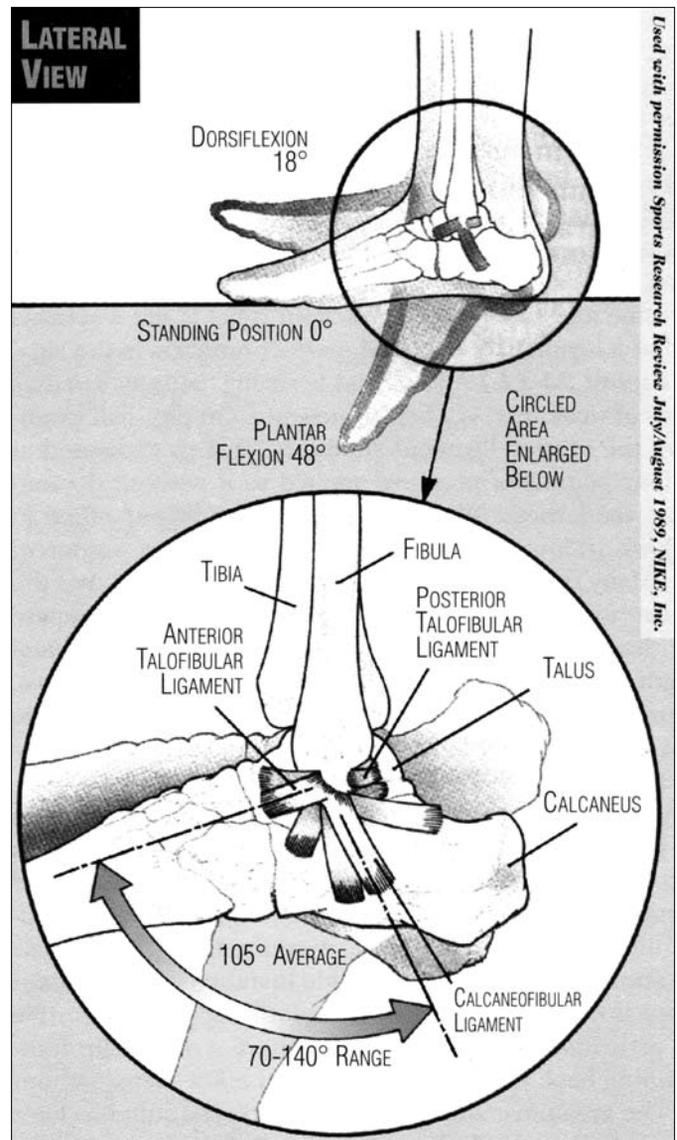


Figure 3. Joint motion and stability. Injury to the above ligaments leads to chronic ankle instability and its associated symptoms. These include ankle pain, weakness, and frequent sprains.

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1.5-inch needle. I begin at the posterior distal fibula and inject 0.5cc at each injured area around to the anterior aspect as indicated. (See Figure 4.) Next, I will inject the injured ligament attachments to the calcaneus and talus including the calcaneo-cuboid ligament, if necessary. (See Figure 5.)

Medial: The medial (deltoid) ligaments are injured much less commonly. Examination will reveal tenderness at the ligament attachments to the medial malleolus and



Figure 4. Prolotherapy injection of the lateral ligament.

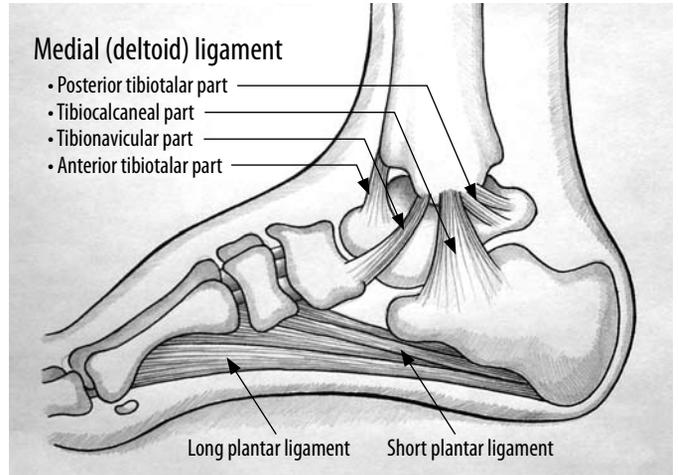


Figure 6. Medial ligaments of the ankle.



Figure 5. Prolotherapy injection of the calcaneo-cuboid ligament.



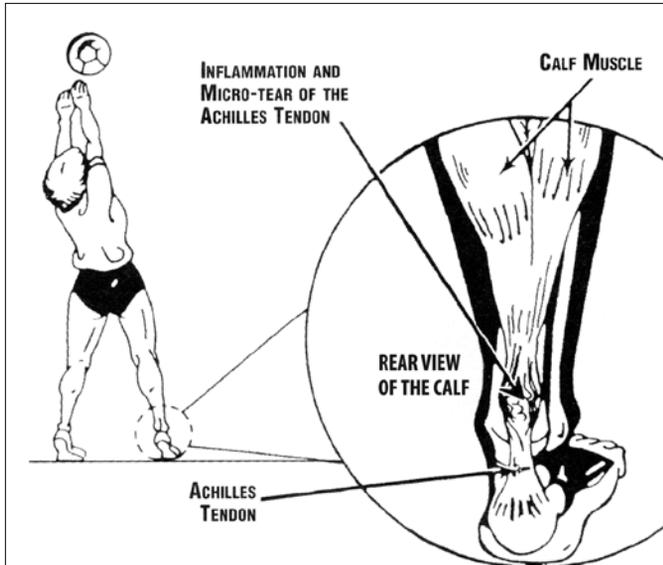
Figure 7. Prolotherapy injection into the medial ligaments.

calcaneus, navicular and talus (anterior and posterior talo-fibular ligaments, calcaneo-fibular ligament, and talo-navicular ligament. (See figure 6.) In this area, we will exercise caution at the posterior aspect of the medial malleolus due to the tibial nerve and posterior tibial artery. We will only give the injections with the needle touching the bone and will reposition the needle if the patient reports “lightning” shooting into the foot. After identifying the injured areas and prepping the skin, we utilize 6 to 10cc of standard Prolotherapy solution. Using a 10cc luer lock syringe with a 25G 1.5-inch needle we will inject 0.5cc at each point of the injured ligaments of the medial malleolus. (See Figure 7.) Next we will inject 0.5cc into each spot of injured deltoid tendon at its attachment to the calcaneus, talus and navicular.

ACHILLES

Injury to the Achilles tendon is common. (If the tendon has a complete rupture then orthopedic surgery is required and referral will be made promptly). This injury is not difficult to identify. The offending spots are very tender to palpation and in many cases there is a tender swelling mid-tendon (not merely at the teno-osseous junction). (See Figure 8.) Treating injury to the Achilles tendon is one of the exceptions to “injecting only with the needle touching bone” guideline.

After identifying the injured areas I will draw up 3 to 6cc of standard Prolotherapy solution. Using a 25G 2-inch needle, I will “pepper” (See A.) (See Figure 9.) the attachment to the calcaneus with 3cc of Prolotherapy solution, as indicated, and further “pepper” any mid-tendon tear with an additional 3cc of solution. (See Figure 10.)



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Figure 8. Achilles Tendon Injury. Prolotherapy is an excellent treatment to strengthen the Achilles tendon.

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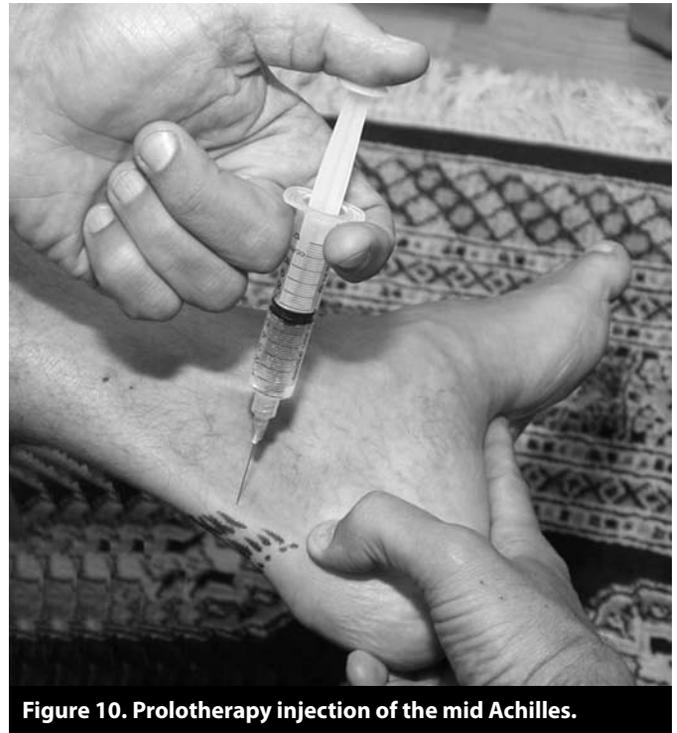


Figure 10. Prolotherapy injection of the mid Achilles.

A. Peppering is a technique where an area is peppered with injections of 0.5cc of solution. The technique is begun with an injection of 0.5cc into the injured structure then the needle is partially withdrawn and redirected slightly and reinserted around the injured area and another 0.5cc are injected there. This is repeated multiple times thus "peppering" the fibro-osseous insertion of the tendon or ligament.



Figure 9. Prolotherapy injection into the Achilles tendon.

The patient will be requested to do no jumping, running, climbing, or sudden starts and stops. I routinely ask them to wear a heel (about 1.5 inches works well). For men, this is challenging, cowboy boots work for many.

HEEL

Plantar fasciitis: plantar fasciitis and heel pain are vexing problems that are frustrating and debilitating to patients. Fortunately they have come to us for treatment with Prolotherapy! There are three primary areas for the injury to the plantar fasciitis: the calcaneous, mid-arch, and attachments to the metatarsal heads. The patient can accurately point to the offending spot, and palpation confirms the diagnosis.

Position the patient on the table face down with the knee bent and the foot up in the air. To inject the calcaneal attachment we will avoid the thick plantar heel callus. The entry point is just medial plantar just distal to the heel pad. It is a good idea to warn patients that injecting the heel and ball of the foot is usually very painful. The 25G 2-inch needle is angled back to the attachment on the calcaneous (See Figure 11.) About 3cc of Prolotherapy solution is "peppered" into the calcaneal attachment.

Mid arch pain: there are numerous tendons and ligaments running on the under surface of the arch (long plantar ligament, plantar calcaneo-cuboid ligaments). (See Figure 12.) Prolotherapy to this area is extremely effective. And interestingly, it is not very painful to inject here. The insertion point is just plantar to the navicular tubercle. The needle is inserted straight across the arch to contact



Figure 11. Prolotherapy injection to the heel.



Figure 13. Mid-foot Prolotherapy injection.

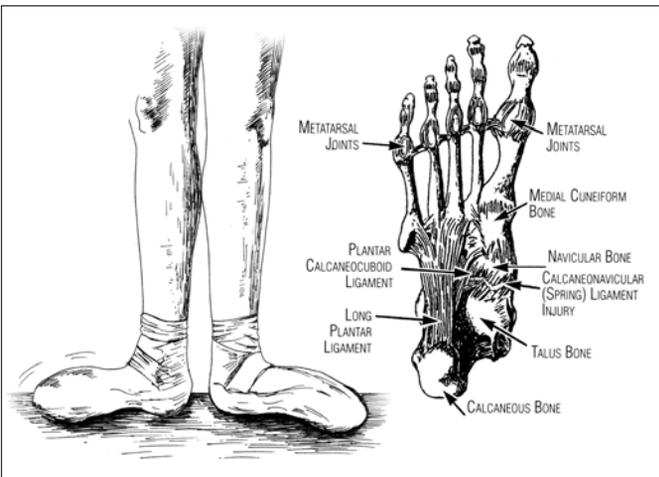


Figure 12. Abnormal foot biomechanics in a ballet dancer. Dancers develop a “dropped” arch to compensate for tightness in the hip, so successful treatment of the foot includes Prolotherapy to the plantar fasciia and spring ligament, as well as physiotherapy to the hip. Spring ligament injury is a common cause of a “dropped arch,” especially in ballet dancers.

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the bone on the lateral side of the under-surface of the arch. (See Figure 13.) The metatarsal and tarsal bones are “peppered” in a fan-like figure. Approximately 3 to 5cc of Prolotherapy solution are injected here using a 25G 2-inch needle. For an hour or two after the injections the patient will feel like he or she is walking on a golf ball.

For plantar fasciitis, there are a couple of concurrent treatments that are helpful. The most important is Functional Orthotics. If the patient has hyper-pronation at the ankle, and they almost all do, then orthotics are

a must. Otherwise, the plantar fasciitis is likely to recur (if we can get it to heal in the first place). The second helpful treatment is again, elevating the heel about 1.5 inches. This decreases tension on the plantar fascia and is effective in relieving pain (this will not, however, heal the plantar fasciitis by itself).

METATARSAL-PHALANGEAL

Injuries at and around the MTP joints are quite painful. Careful palpation will reveal if the injury is at the plantar fascia attachment to the distal metatarsal, or to the joint itself or between the MTP joints. Each joint is palpated individually and sometimes while moving the joint. After identifying the injuries, we will treat the distal metatarsal head by cleansing the skin and if the injury is plantar, will enter through the skin just proximal to the callus of the ball of the foot and pepper the fibro-osseous junction (See Figure 14.) For injury at the proximal end of the MTP phalanx, approach is made from the skin just distal to the callus of the ball of the foot directly over the phalanx. (See Figure 15.) When the injury is on the dorsal side of the MTP, the approach is from the top. (See Figure 16.) 0.5 to 1cc is injected at each affected site.

BUNIONS

This is a fairly common condition. Often it hurts, however, some people merely don't like the way it looks. Here we have some good news and some bad news. The good news is that we can heal the injured ligaments and tendons so the pain is relieved. The bad news is that we can't improve its cosmetic appearance.



Figure 14. Prolotherapy injection of the proximal plantar MTP.



Figure 15. Prolotherapy injection of the distal plantar MTP.



Figure 16. Prolotherapy injection to the dorsal MTP.

The treatment is straight forward. Begin by cleansing the skin over the first MTP medially. Using a 25G 1.5-inch needle we will inject about 2cc of Prolotherapy solution around and into the joint on its medial aspect. (See Figure 17.)



Figure 17. Prolotherapy injection to a bunion.

The foot and ankle are very complex structures with many more ligaments and tendons and joints than we have covered in this article. I have tackled the most common conditions. Now we can Prolo our patients' foot and ankle pains away! ■

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