

Is Injection Therapy The Best Solution for Foot Neuromas?

VOLUME: 15 PUBLICATION DATE: Jan 01 2002

Sidebars_in_article:

Issue Number:

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Foot neuromas are very common findings, especially those that are termed intermetatarsal neuromas (or interdigital neuromas). The painful condition is believed to be caused by sensory nerve irritation, injury or abnormal mechanics of the foot. Yes, there are conservative care modalities as well as surgical treatment measures. However, I believe chemical neurolysis (using a dilute solution of ethyl alcohol) gives us a viable alternative for treating the foot neuroma as it has fewer potential complications and up to an 89 percent success rate.¹

First things first. When it comes to diagnosing neuromas, be on the lookout for symptoms that may range from numbness, tingling, sharp pain or muscle cramping in the foot or toes.² Taking an accurate history and performing a good clinical examination is usually all that is necessary to make the primary diagnosis of neuroma formation. More sophisticated and costly forms of diagnostic techniques, such as ultrasonographic evaluation, are slowly becoming more prevalent in diagnosing neuromas.³

Taking A Closer Look At The Treatment Options:

The standard treatment for these conditions is relatively limited and includes the conservative care options of massage, tape strapping of the foot, functional orthotic foot devices, change in shoe type or style, decreased physical activities, and one or more cortisone injections into the involved area. Complications with the different forms of conservative treatments vary but may include failure to improve the symptoms, difficulty in wearing certain shoes, worsening of the condition, cortisone atrophy or discoloration of the skin.

When these conservative measures fail to relieve the patient's symptoms, then surgical treatment is often recommended. The surgical treatment options include completely excising the neuroma, doing internal or external surgical neurolysis, transferring the involved nerve tissue without cutting the nerve, and, in some cases, performing adjacent osseous procedures. As far as surgical incisions go, you would make them directly over the neuroma, longitudinally on the dorsal or plantar aspect of the foot between the metatarsals or transversely on the ball of the foot.

However, be aware that surgical complications may include painful or unsightly incisional scar formation, deep tissue adhesions or fibrose tissue formation, creation of a "stump" neuroma, incisional wound dehiscence, postoperative infection and swelling.⁴ Many patients complain of an unpleasant sensation following nerve surgery that is difficult for them to accurately describe. Even when you've greatly improved the painful neuroma symptoms, you may hear post-operative comments such as "it feels funny," "it feels weird," "it feels like there is a lump in my sock" or "I just don't like how it feels."

How To Create The Sclerosing Solution For Injection Therapy:

The injection treatment technique for neuromas is credited to the late Dr. Marvin D. Steinberg.⁵ I first heard Dr. Steinberg lecture on the subject of dilute alcohol injections and Vitamin B-12 injections for neuromas in 1973 while I was attending the Ohio College of Podiatric Medicine in Cleveland. That same year, Max Weisfeld published his paper on treating porokeratosis plantaris discreta with 4% ethyl alcohol injections.⁶ At that point in my training, I became a devout student of the effects of dilute alcohol injections on nerves and keratotic lesions.

I have previously described the technique of using a sclerosing solution of 4% mixture of ethanol to treat foot neuromas, both those that have failed previous conservative treatments and for those cases of recurrent or stump neuroma formation.⁷

You can create the 4% alcohol sclerosing solution by mixing 48 ml of a local anesthetic agent with 2 ml of absolute (dehydrated or desiccated) ethyl alcohol (ethanol). I have used pure ethanol for injection, USP, and 0.5% bupivacaine HCl with epinephrine (1:2000,000) for most mixtures. You can also make the 4% dilution of alcohol with 48 ml of 2% lidocaine plain and 48 ml of pure ethyl alcohol, but I have had much better results with the bupivacaine-epinephrine combination.

The pure ethanol for injection comes in 1 ml vials and you would add two of these to the 48 ml of local anesthetic agent to create the dilute solution. Once you have sterilely prepared the solution, apply a new label to the bottle to prevent inadvertent local blocks with the sclerosing solution.

Given the viability of the mixed alcohol solution, it is my opinion that you can maintain it for at least six months. The three keys are protecting the bottle from direct sunlight exposure, maintaining the mixed solution in a closed multi-dose bottle and avoiding direct exposure to air. Once you mix the alcohol solution, you should date it in order to stay abreast of its shelf life. You can obtain small bottles of ethanol for injection from several suppliers or local pharmacists and mix the solution in your office to reduce costs.

Essential Pearls For Successful Outcomes:

When injecting most nerve lesions (virgin neuromas, nerve entrapments or stump neuromas), you need to inject an adequate volume of the 4% alcohol sclerosing solution (usually 0.5 to 1.0 ml) proximal to the maximum point of tenderness. In other words, you shouldn't do the injection into the actual neuroma or site of the nerve entrapment but ensure that it is more proximal to that point where the nerve is more likely to be 'normal.'

This allows more of the dilute alcohol to be absorbed into the nerve tissue and, theoretically, there is more potential for nerve destruction with repeated injections. A local anesthetic nerve block is not necessary prior to injecting the 4% alcohol solution since this will make locating the involved nerve more difficult and may add further dilution to the injected alcohol solution.

You would give the injections weekly (five to 10 day-intervals), using a small syringe with a 1-1/4 inch, 27-gauge needle. Using the longer needle helps you ensure close placement of the injectable to the involved nerve tissue.

Repeat this injection process for three to seven visits. If the patient is totally symptom-free after three injections, then you can discontinue all treatments. If you see no improvements of symptoms after the third injection, I suggest trying one of the other alternative treatments.

On the other hand, if you see some decrease in symptoms following the third injection, I suggest continuing for the duration of seven injections. After you've given the full series of seven injections, it is advisable to wait approximately 90 days before deciding upon further treatment since many cases will continue to show gradual improvement afterward. This may be due to continued degeneration of the involved nerve and, ultimately, successful chemical neurolysis.

Case Study 1: When Orthotics And A Cortisone Injection Fall Short.

A 32-year-old female patient came in with a complaint of increasing burning and pain on the ball of the left foot. Over a 10-month period, she had changed her shoe styles, decreased her activity levels and used an over-the-counter foot massager with no improvement in symptoms. Another physician had recommended neuroma surgery but the patient was reluctant to pursue this approach, however she did believe the pain had grown worse with time.

During the clinical examination, I noted reproducible pain and radiating tingling into the third and fourth toes of her left foot with compression and direct palpation of the third intermetatarsal space. X-rays showed no abnormalities and the patient's history was negative for contributory findings. I made a clinical diagnosis of intermetatarsal neuroma of the left foot.

I gave the patient a list of potential treatment options, including cortisone injection, orthotics devices, a series of alcohol sclerosing injections or nerve surgery. I recommended a cortisone injection and orthotic devices as the first line of treatment and she was agreeable. I gave the patient a cortisone injection (1 ml of dexamethasone plus 1 ml of local anesthetic agent) into the third intermetatarsal space at the point of maximum tenderness.

I then scheduled her for examination and casting for custom orthoses. After receiving the orthoses, the patient said she had experienced about one week of improvement following the cortisone injection. I instructed her to wear the orthoses for the next six weeks and to make a follow-up appointment.

At the next visit, the patient reported the pain in the ball and toes of the left foot had returned. I recommended the series of alcohol sclerosing injections and gave the first injection of 1/2 ml of 4 percent alcohol proximal to the maximum point of tenderness. I then instructed the patient to make six consecutive weekly appointments for additional alcohol injections.

After five weeks, the patient was totally pain free. She completed all seven of the injections and, during a six-month follow-up visit, reported no recurrence of symptoms. Later the next year, the patient returned and I corrected her bunion deformity.

Case Study 2: When The Patient Has Burning And Numbness

A 56-year-old overweight female came into the clinic complaining of burning pain in the ball of the right foot and a feeling of numbness in the middle toes. The insulin-dependent diabetic patient had previously been treated with two cortisone injections and orthotic devices. When the foot problem grew worse over the last several months, the patient came in to our clinic.

After doing the physical examination, it was apparent the patient had a clinical neuroma of the third intermetatarsal space of the right foot with burning and numbness both reported. The exam revealed evidence of thinning and discoloration of the skin over the area of the previous cortisone injections. I discussed the options of a series of 4 percent alcohol sclerosing injections and surgery to remove the neuroma.

The patient elected to proceed with the injection series and I performed the first injection on the initial visit. I then saw her for four additional weekly injections of 1/2 ml of 4 percent alcohol and provided no other treatment. The patient had almost total resolution of her foot symptoms and discontinued treatment because she was pleased with the results as they were. This patient continued to be a great source of referrals, as we saw her friends and acquaintances for several years.

Final Notes

Injecting a dilute solution (4%) of ethyl alcohol for chemical neurolysis is a good alternative to other conservative treatments (such as cortisone injections) and surgical options for foot neuromas. There are very few reported complications with this technique and the success rate is relatively high.

During the early stages of treatment, you may find that some patients have an increase in the nerve symptoms of burning or pain, which is a direct result of nerve irritation from the chemical solution.

However, be aware that this early post-injection increase in pain is believed to be a good sign and usually indicates that you'll have favorable results.

In those patients that have some improvement but have not achieved complete resolution of their symptoms at the completion of the injection series, it is advisable to allow additional time to occur since many of these cases continue to improve. After about three months, if the patients still have pain, you can offer them the following options: a) discontinue all treatments; b) proceed with an additional series of 4% sclerosing injections; c) consider a cortisone injection; or d) undergo surgery.

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