

Neuritic Bunion Syndrome

JAMES S. ROSEN, DPM*
JOHN F. GRADY, DPM†

An alternative explanation of the etiology of bunion pain is presented. In the past, bunion pain has been explained by osseous pathology. The authors suggest that entrapment neuropathy of the medial dorsal cutaneous nerve should also be considered when dealing with symptomatic bunions.

For many years, surgery for a painful bunion has consisted primarily of medial eminence resection of the first metatarsal head, and, when necessary, reduction of the intermetatarsal angle between the first and second metatarsals. This gave good cosmetic results and frequently reduced or eliminated the patient's symptoms; however, an explanation as to the actual etiology of the symptoms has not been made clear.

The discomfort of a bunion was described by Giannestras¹ as a bursitis over the exostosis found at the medial aspect of the first metatarsal head. This would appear to be a far more believable explanation of the pain associated with bunions than the so-called "bump pain" frequently reported. Just as the malleoli remain asymptomatic in boots, why should the first metatarsal head be painful in shoes? The experienced practitioner has seen those patients who presented with moderate to severe bunion deformities and remained totally asymptomatic, while others who had minimal deformity had symptoms consisting of pain and altered sensation.

In those cases where there appears to be no bursa formation or any other sign of inflammation over the medial or dorsomedial eminence, how can the symptoms commonly seen with bunions be explained? The mere presence of an osseous mass

does not appear to adequately explain the symptomatology. The lack of predictability, based on the severity of the deformity, toe position, and bump size, only supports the concept that bump or bone pain is a false premise, short of a true histopathologic process.

Another etiology for the symptoms that frequently accompany the bunion deformity must be hypothesized. A likely explanation for the pain and discomfort experienced by patients with bunions is entrapment neuropathy.²⁻⁷ An entrapment neuropathy of the medial dorsal cutaneous nerve to the great toe would give rise not only to the pain experienced frequently with bunions, but also would explain the paresthesias distal to the metatarsophalangeal joint of the great toe.

Carrel and Davidson⁸ describe the classic signs of nerve entrapment as pain distal to the entrapment; peripheral pain proximal and distal from the point of palpation; entrapment or Valleix's phenomenon; altered skin sensation; muscle atrophy or weakness; transitory relief with local infiltration of a steroid; rest pain increasing at night; and Tinel's sign, pain, and paresthesias distal to the point of palpation. In patients with symptomatic bunions, many of these classic findings are present.⁹

Sumner and Gilliat¹⁰ described entrapment neuropathy as "a peripheral nerve lesion occurring at specific sites where the nerve is distorted by a fibrous band or a fibro-osseous tunnel." Additionally, rather than a true congenital or non-traumatic etiology, there are several acquired pathologies that may create a pressure neuropathy.^{3,11-13} A tight flexor retinaculum seen with tarsal tunnel syndrome, shoe pressure,¹² lipomas, and other types of

* Diplomate, American Board of Podiatric Surgery; Associate Professor of Orthopedics, Dr. William M. Scholl College of Podiatric Medicine, Chicago, IL

† Fellow, American College of Foot Surgeons; Diplomate, American Board of Podiatric Surgery; Director, Sports Medicine Center, Dr. William M. Scholl College of Podiatric Medicine, Chicago.

Mailing address: 1001 N Dearborn St, Chicago, IL 60610.

masses and varicosities can predispose the patient to entrapment neuropathies.

Jahss² and Root⁶ specifically mention pressure neuropathy as it related to symptoms seen with bunions. Both authors fail to elaborate on its significance and do not suggest methods of treatment.

In addition to direct trauma to the nerve substance itself, its circulation can be impaired because of the constricture or direct pressure to the vasa nervosa, thus creating a localized ischemia to the nerve.¹³

The nerve specifically involved in bunion symptomatology is a branch of the superficial peroneal nerve. Kernohan and Lavock¹⁴ and McAuliffe et al¹¹ discuss entrapment of the superficial peroneal nerve, but at a higher level relieved by fasciotomy. The nerve discussed here is a segment off the medial branch of the superficial peroneal nerve.

In 1982, Merritt and Subotnick⁵ discussed a pressure neuropathy of the medial plantar proper digital nerve (Joplin's neuroma) to the great toe. Neuropathies in the area of the first metatarsophalangeal joint have been described previously, but not of the particular nerve discussed in this report.

Case Reports

Case 1. On May 29, 1985, a 35-year-old Caucasian female presented to the Dr. William M. Scholl College of Podiatric Medicine Clinic complaining of a painful right bunion. She described a burning pain that "shot into the toe." She also related that the pain was worse when she was wearing tight shoes. Pain was found on palpation of the medial dorsal aspect of the first metatarsal approximately 1 cm proximal to the first metatarsophalangeal joint. A positive Tinel's sign was present.

Radiographs showed mild hallux valgus on the right foot. A diagnosis of a nerve entrapment of the medial dorsal cutaneous nerve was made. On this initial visit, 10 mg of methylprednisolone acetate and 1 cc of 2% plain mepivacaine hydrochloride injected into the area gave immediate relief. The patient returned 1 week later and said the relief lasted until the injection wore off. Identical clinical findings were made on this visit. The patient presented symptoms identical to those present prior to the injection.

The patient returned 2 weeks later, and the same symptoms were present. The patient's foot was taped and padded with a low Dye strap and a longitudinal metatarsal pad. This treatment afforded no relief. Padding applied 1 week later to

float pressure away from the area provided some relief.

The patient returned on November 11, 1985, with the same symptomatology as she had on the initial visit. Several opinions were obtained from the clinical faculty at the college. The consensus was that she had a nerve entrapment of the medial dorsal cutaneous nerve. Treatment options were discussed with the patient, and she opted for surgery.

On November 18, 1985, the patient returned for a diagnostic injection of 2% lidocaine plain into the area of the nerve entrapment. The patient was told to call the next day and report the results so that further treatment could be determined. She failed to call, but returned on November 26, 1985, stating that the injection administered on November 18 had resulted in alleviation of symptoms of her bunion pain. The proposed surgical procedure was discussed with the patient, and it was decided to perform a neurolysis (decompression) of the medial dorsal cutaneous nerve.

The surgery was performed on December 10, 1985. The patient tolerated the procedure well. At the initial postoperative visit on December 16, she exhibited a negative Tinel's sign and negative Valiex's phenomenon. There were no signs of shooting or radiating pain or paresthesias. She did have local tenderness and swelling at the surgical site.

The patient was seen most recently on January 17, 1986. She no longer had the shooting pain she had experienced on the dorsum of the foot. She is currently satisfied with the results of the surgery and undergoing a normal postoperative course.

Case 2. A 16-year-old well developed, well nourished Caucasian female presented with a painful bunion on her right foot. There was a mild hallux valgus on the right foot and a flexible pes planus. She described a "shooting pain into the big toe." She had pain on direct palpation of the area approximately .5 cm proximal to the first metatarsophalangeal joint of the right foot on the dorsomedial aspect of the first metatarsal. The suspected nerve was palpated below the skin. Tapping on the nerve elicited pain distally. This was consistent with a positive Tinel's sign.

A diagnosis of nerve entrapment of the medial dorsal cutaneous nerve was made. In order to rule out other causes of the pain, .25 cc of 1% lidocaine plain was injected near the nerve. The patient returned 1 week later and stated that the injection totally alleviated the pain for 2 hours. After that, the pain returned. At this time, .25 cc betamethasone phosphate and acetate mixture with .75 cc of bupivacaine plain was injected into the area of the

suspected nerve entrapment. One week later, the patient returned and stated that the foot felt better for approximately 3 days. After discussing the case with the patient and her mother, it was decided that surgical intervention was the treatment of choice.

Two months later, a neurectomy of the medial dorsal cutaneous nerve to the hallux was performed. Approximately 1 cm of hypertrophic nerve was resected. The pathology report identified the specimen as perineural fibrosis. The patient has been free of pain for 1½ years postoperatively, but the hallux abductus has continued to worsen.

Discussion

Two case reports of patients who presented with signs and symptoms of a typical painful bunion and a typical nerve entrapment have been presented.

The importance of accurately diagnosing the cause of patients' symptoms cannot be overemphasized if good results are to be expected postoperatively.

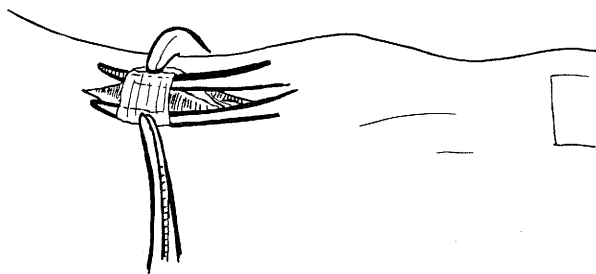
Neurolysis is not being offered as an alternative to exostectomy; however, if the symptoms appear

more neurologic than arthritic or inflammatory, neurolysis by itself or in conjunction with exostectomy and/or osteotomy should be considered. In selected patients who have minimal deformity and adequate range of motion, neurolysis may be the treatment of choice by itself.

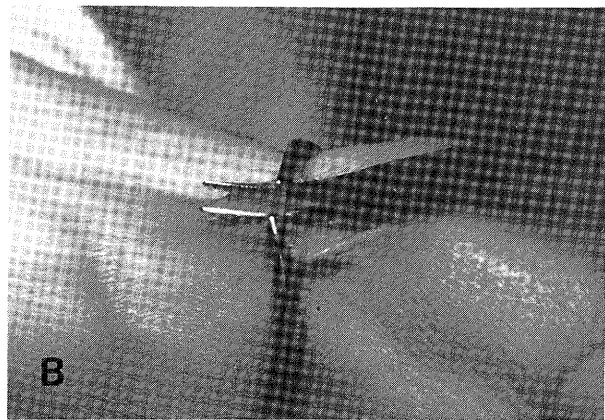
Since the symptoms are purely sensory in nature, electromyography may not be of value in the diagnosis of this particular neuropathy. The use of sensory composed nerve action potentials may be of value and have been used to help diagnose interdigital neuropathies.¹⁵ Other tests in addition to electromyography, such as nerve conduction velocity studies, tactile sensation, and detection of vibration over the area in question, have been used in the diagnosis of entrapment neuropathies.

Loss of vibratory sensation is one of the earliest signs of decreased function.¹⁶ Local anesthesia can be used in determining the extent to which the pain is neurologic in origin.¹⁷ If the pain is completely relieved by selectively blocking the medial dorsal cutaneous nerve to the great toe, then there would be a high level of confidence that a neurolysis at the site of the injection would be successful.

The location and morphology of the above described entrapment neuropathy are shown in Figures 1 and 2.

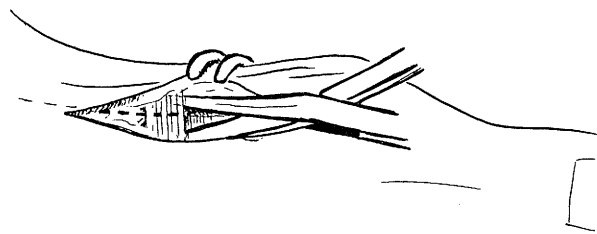


A



B

Figure 1. Diagram (A) of the fibrous band overlying the medial dorsal cutaneous nerve shown with an intraoperative photograph (B) of the band.



A



B

Figure 2. Diagram (A) of the fibrous fascial band as it thickens crossing over the medial dorsal cutaneous nerve, with an intraoperative photograph (B) of this band.

Summary

An alternative to the etiology of bunion pain has been presented along with two case reports. In addition, the authors have had a total of six other cases with signs and symptoms similar to the two cases presented. Neurolysis and/or exostectomy were performed and resulted in alleviation of the patients' symptoms.

The term "neuritic bunion syndrome" has been coined by the authors to describe a complex multifactorial etiology that includes entrapment neuropathy secondary to anatomical variation and direct pressure, which helps create the signs and symptoms seen in bunion deformities.

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