Clinical Research on Foot & Ankle

Mini Review Open Access

Foot Pain Leading to Morton Neuroma and its Management

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Abstract

Morton's neuroma is a common pathology affecting the forefoot. This is nerve fibrosis, not a true neuroma. This is secondary to pressure or repetitive stimulation that results in thickening of the digital nerve located in the 3rd or 2nd intermetatarsal space. Treatment options include braces, steroid injections, and surgical excision, usually with a dorsal approach. Careful clinical evaluation, patient selection, preoperative counseling, and surgical technique are key to successful treatment of this condition.

Keywords: Morton's neuroma; foot; forefoot pain; digital nerve

Introduction

Morton's neuroma was first described in 1876 by American surgeon Thomas George Morton. This is a common medical condition that affects the front legs [1]. This is not a true neuroma, but fibrosis of the nerve in the finger. It is caused secondarily by pressure or repetitive stimulation and thickens the nerve in the second or third intermetatarsal space. The third intermetatarsal space is most commonly affected. Histologically, neuromas show neuroedema, demyelination (axonal injury), and perineural fibrosis. This degenerated tissue thus causes localized pain and discomfort, primarily on exertion. Current literature suggests that the use of shoes with pointed heels may be the culprit. This is because increased pressure on the forefoot can lead to nerve damage.

A baseline weight-bearing radiograph helps rule out other causes of forefoot pain and provides an osteological overview [2]. USS and magnetic resonance imaging (MRI) are comparable modalities for diagnosing Morton's neuroma. An experienced musculoskeletal radiologist can use USS to create a neuroma with 95% sensitivity. However, if the diagnosis is in doubt, the MRI scan is the gold standard scan for identifying neuromas and is most readily seen in the T1 axial section.

The presence of a neuroma does not automatically mean that a person will experience symptoms of Morton's neuroma. Bernardino studied her 57 patients and found that his third of the patients radiologically had neuromas but were asymptomatic [3]. The mean diameter was 4.1 mm for him in the asymptomatic group compared to 5.3 mm for him in the symptomatic group [4]. A diagnosis of Morton's neuroma is relevant only if the transverse diameter is ≥5 mm on her MRI scan and can be correlated with clinical findings. In a prospective, randomized controlled trial, there was no statistically significant difference between the mean size of neuromas that responded to treatment with steroid injections (11 mm) and those that did not respond (12.5 mm) [5]. The study authors also noted that neuroma size in patients whose symptoms recurred was not significantly different from those who remained pain-free at 12 months. , found that the effects of steroid injections persisted [6]. The literature therefore suggests that lesion size does not always correlate with symptom severity, and that small neuromas respond better to steroid injections than large neuromas, although both patient reports results are improved by injection.

Management

Management of neuromas can be divided into nonsurgical or surgical management. Treatment algorithms generally include non-surgical measures, including injection therapy, and if these measures do not improve symptoms, surgical resection is the next option [7]. Patient education is very important and using wide-toed shoes may be the easiest way to manage symptoms. However, patient compliance is an issue and unresolved symptoms can occur.

Surgical Excision

Neuromas can be resected using two methods, either a dorsal or plantar approach. The dorsal approach allows the patient to bear weight immediately, whereas the plantar approach carries the risk of wound complications and cicatricial hypersensitivity. However, no studies have shown an advantage over one or the other. The plantar approach is used less frequently, and his success rate after removal ranges from 51% to 85%. Walfort et al. conducted a prospective study of 17 neuromas by plantar approach and achieved an 80% success in returning to preoperative footwear [8]. The dorsal approach allows weight bearing immediately after surgery and is better tolerated by the patient. Cofflein et al. performed a review of his dorsal surgical resection at 5.8 years in 82 patients, of whom 85% reported excellent or favorable outcomes and 65% remained pain-free at her 5.8 years. Womack had 61% success in her 232 patients. The posterior approach is the author's preferred surgical method.

Adjacent Neuroma

Morton's neuroma of the adjacent intermetatarsal space is common, with reported incidences of up to 28%. Several studies have reported reduced patient satisfaction with resection of adjacent interdigital neuromas, but the reasons for this are unknown. There is no clear consensus as to whether both neuromas should be respected [9]. Excision of both neuromas can increase complications related to wound healing and hearing loss. Therefore, some clinicians resort to treating this by resecting one of the neuromas and decompressing the adjacent intermetatarsal space. Others believe that sequential excisions are performed after excision of more symptomatic neuromas, if necessary [10]. Failure rates after surgical resection have been reported to be up to 30%. The leading causes of pain after surgical resection

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Received: 01-Sep-2022, Manuscript No: crfa-22-75399, **Editor assigned:** 02-Sep-2022, PreQC No: crfa-22-75399 (PQ), **Reviewed:** 15-Sep-2022, QC No: crfa-22-75399, **Revised:** 19-Sep-2022, Manuscript No: crfa-22-75399 (R), **Published:** 26-Sep-2022, DOI: 10.4172/2329-910X.1000367

Citation: Montoro C (2022) Foot Pain Leading to Morton Neuroma and its Management. Clin Res Foot Ankle, 10: 367.

are misdiagnosis, neuroma of the adjacent intermetatarsal space, incomplete resection, complex regional pain syndrome, or Morton's neuroma, also known as stump neuroma is recurrences of factors contributing to recurrence include new neuroma formation, adhesions, and accessory branches of the digital nerve. Several methods have been documented to prevent the formation of stump neuromas [11,12]. The use of steroid injections is the most common method used to treat pain after surgical excision. The mechanism of action is the destruction of scar tissue and adhesions [13]. Dellon and Mackinnon described a technique for grafting nerve stumps into muscle. In her 60 patients with 78 neuromas, 82% of the cohort had good to excellent results. Proximal excision of neuromas by muscle grafting of new stumps is also possible. Overall, the chances of success after reoperation are significantly worse than with primary resection.

Conclusion

Morton's neuroma is a common cause of forefoot pain. In most cases, it cannot be treated surgically at first. Steroid injection is a useful diagnostic and therapeutic non-surgical modality. Careful clinical evaluation, patient selection, preoperative counseling, and surgical technique are key to successful treatment of this condition.

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