

Bilateral Finger Morton Neuroma after Primary Fingertip Amputation

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Summary: Morton's neuroma (MN) is a painful, proliferative fibrosis of perineural tissue caused by pressure or recurrent irritation that was previously thought to affect only the common interdigital nerve of the foot. We present a case of a bilateral MN of both the ulnar and radial proper digital nerves of the fifth finger in a 30-year-old patient, following multiple surgeries on the aforementioned finger. The patient was referred to our center by a peripheral hospital after traumatic fingertip amputation distal the DIP joint, where the fingertip was initially simply sutured. Because of progressive neuropathic pain, he underwent two revision surgeries, in which the distal phalanx was removed, two neuromas were excised, and the nerve stumps were shortened, but both were unsuccessful. A final, more extensive revision surgery was then carried out, in which two club-like enlargements were excised and the nerve stumps coadapted to form a loop. Histopathological examination of the excised specimen revealed perineural fibrosis in the context of a Morton's neuroma. This is, to our knowledge, the first documented case of a bilateral MN of the hand, which may have resulted from an inadequate primary finger and nerve shortening, resulting in high pressure from the surrounding soft tissue. Finally, this report emphasizes the significance of optimal treatment for finger amputation injuries, as well as the fact that for neuromas, simple nerve resection should be avoided whenever possible, because of the high recurrence rates. (*Plast Reconstr Surg Glob Open* 2022;10:e4035; doi: 10.1097/GOX.0000000000004035; Published online 27 January 2022.)

Morton's neuroma (MN) was first documented in 1876 by Thomas George Morton, an American surgeon.¹ It is a type of degenerative neuropathy featuring fibrosis that usually affects the common interdigital nerve of the foot, mostly affecting middle-aged women.² The predominant symptom is localized pain, described as burning, stabbing, or tingling with electric sensations.³

CASE REPORT

A 30-year-old male patient working as a carpenter with active tobacco use and no relevant comorbidities

presented in our plastic surgery outpatient clinic with persistent pain in his left little finger. Three years prior, the patient suffered a traumatic fingertip amputation distal the DIP joint using an electric planer. Primary care was carried out in a peripheral hospital, where the fingertip was initially simply sutured in the emergency room. Furthermore, because of persistent pain and the suspect of remaining nail matrix the finger was re-operated in the operating theater 1 month later. Due to persistent burning sensations, residual nail growth, as well as neuroma-like pain of the ulnar and radial proper digital nerve of the fifth finger, the patient underwent his second revision surgery, again in the operating theater, 27 months after primary trauma. To achieve optimal healing, and because the insertion of the flexor digitorum, profundus tendon was no longer given, the distal phalanx was removed, the neuromas excised, and the nerve stumps shortened. Yet again, uneventful healing was followed by progressive neuropathic pain in the entire little finger and ever-present Hoffmann-Tinel-sign. Due to the number of previous surgeries, a conservative approach was taken, but it was unsuccessful. Therefore, 44 months after the initial trauma, because of extreme pain at the slightest touch, as well as Hoffmann-Tinel-sign and burning sensations

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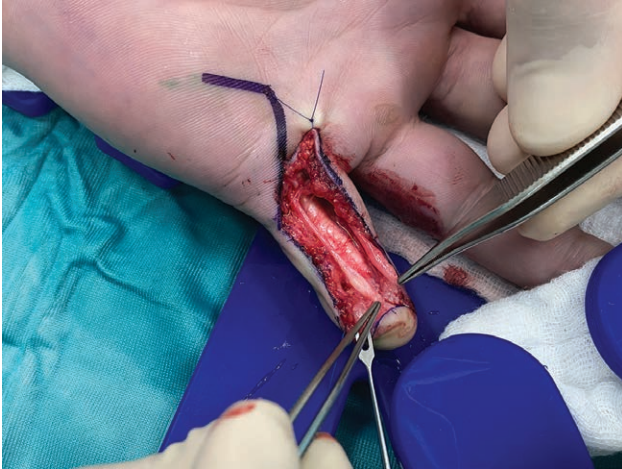


Fig. 1. Fusiform enlargements on the ulnar and radial proper digital nerve of the fifth finger.

during the day and night, the patient underwent the third revision in the operating theater. This time the proper digital nerves were exposed in their entire length from the metacarpophalangeal joint, revealing club-like enlargement of the nerve stumps beginning at the mid-phalanx level (Fig. 1). After resecting the enlarged portion, the stumps were then coadapted to form a loop approximately at the proximal-phalanx level (Fig. 2). The loop was performed using three epineural sutures (Ethilon 9.0; Ethicon, Johnson&JohnsonCompany). After surgery the finger was immobilized for 2 weeks, before the patient began full mobilization and physiotherapy.

Afterward, the specimen's histopathological analysis revealed perineural fibrosis in the context of a Morton's neuroma of both the ulnar and radial proper digital nerve of the fifth finger (Fig. 3). The patient did not develop any neuropathic pain in a follow-up period of 12 months.



Fig. 2. Coadapted nerve stumps of the ulnar and radial proper digital nerve of the fifth finger forming a loop.

DISCUSSION

We conducted a literature search in August 2021 on the National Library of Medicine's MEDLINE database using PubMed as a search engine, with the following search terms: ("MORTON NEUROMA" OR "MORTON'S NEUROMA") and ("HAND" OR "FINGER"). To our knowledge, this is the first reported case of a bilateral MN of the proper digital nerve of the hand, based on a screening of the results.

The neuroma identified by us presented macroscopically, as does every MN, with a fusiform shape, a glistening white color, and a soft consistency; furthermore, the histological examination showed typical neural edema, demyelination, and perineural fibrosis.⁴ In contrast to true neuromas, which are benign nerve tumors that usually develop after nerve injury and are a common complication after amputation injuries of the hand, Morton's neuromas are in fact a proliferative fibrosis of perineural tissue induced by pressure or recurrent irritation, resulting in thickening of the nerve.^{1,5-7} The fact that our patient developed an MN is in our opinion linked to an inadequate primary finger and nerve shortening, which resulted in high pressure from the surrounding soft tissue and perhaps played a role in the etiopathogenesis.

In our opinion, our case shows the possible presence of an MN also on the proper finger nerve, with the resultant extreme high pain affecting the patient's life, but it also underlines the importance of optimal treatment for finger amputation injuries, not just in the case of a possible replantation. Indeed, our patient would have, probably, benefited from a more extensive surgery during the initial phase, preventing the minor injury from affecting his life for almost 4 years with consequent unemployment and high pain. Furthermore, as recommended in 2013 by Guse et al,⁸ comparing all treatments of peripheral neuromas (simple neuroma resection, nerve repair, and nerve transposition), sole nerve resection should always be avoided, when possible, because of high recurrence. In common practice, however, patients suffering from finger amputations with no possibility of replantation are frequently treated in peripheral centers with less experience and the quickest surgery is performed.

In conclusion, it is unclear whether these specific histopathological changes in the nerve are unique to this case, but neuroma prevention should always be mandatory during the initial operation, especially given the high social cost of a patient being unemployed for years and suffering from severe pain. As a result, we believe that the formation of a loop always represents a good tool for preventing painful neuroma formation and should be considered in daily practice. If the neuroma would recur, alternative options to the loop neuroorrhaphy include nerve translocation to the muscle, bone, vein, or subcutaneous tissue, silicone capping, ligation, and coagulation.⁸

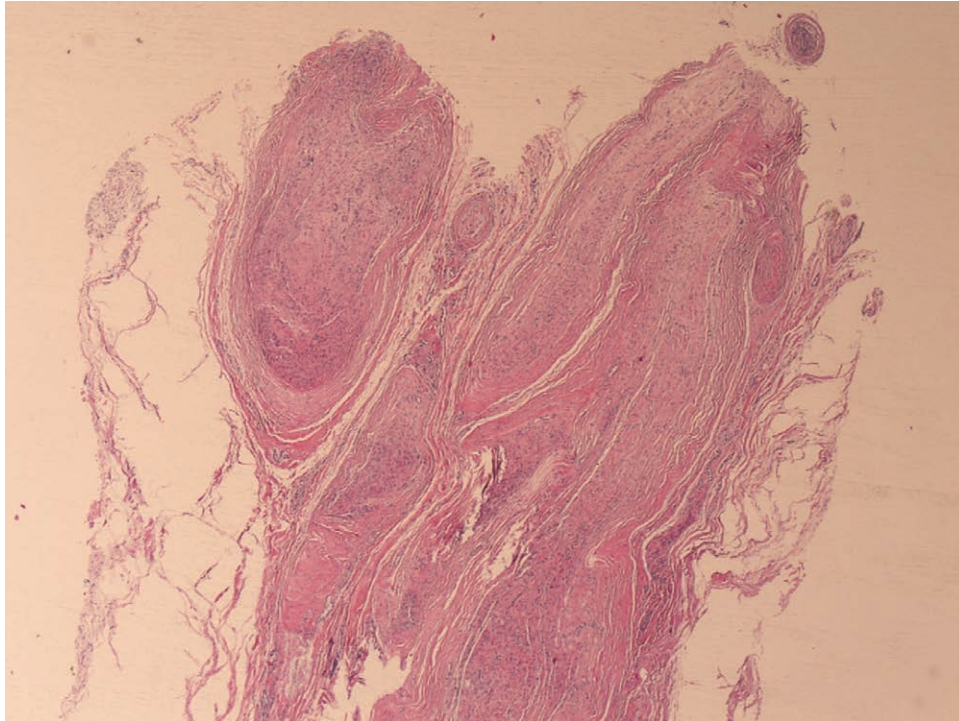


Fig. 3. Morton's neuroma.

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