



## Q/What is the best way to treat Morton's neuroma?

### EVIDENCE-BASED ANSWER

**A/** NO SINGLE TREATMENT HAS BEEN IDENTIFIED in the literature. That said, a protocol of stepped care that showed good results in an uncontrolled trial seems reasonable: patient education and footwear or insole changes, followed by corticosteroid injections and, finally, surgery

(strength of recommendation [SOR]: C, case series).

Injecting sclerosing alcohol depends on the provider's access to and comfort with ultrasound, but the evidence is insufficient to recommend it routinely (SOR: C, case series).

### Evidence summary

Options for treating Morton's neuroma include changing shoe type, using insoles or metatarsal pads, taking nonsteroidal anti-inflammatory drugs (NSAIDs), giving corticosteroid or sclerosing alcohol injections, and surgically excising or transposing the offending nerve.<sup>1-3</sup>

### Different conservative measures produce similar results

A small randomized prospective study of 23 patients compared reduction in neuroma pain using supinatory or pronatory insoles.<sup>4</sup> No explicit inclusion or exclusion criteria other than clinical diagnosis were mentioned. Neither participants nor evaluators were blind to intervention allocations.

Two patients (13%) dropped out at 1 month. At 12 months, pain reduction in the supination and pronation insole groups was 50% and 45%, respectively (not significant).

### Injections improve symptoms with minimal adverse effects

A prospective randomized study of 82 patients compared steroid injections alone with shoe modifications.<sup>5</sup> Primary outcomes were patient satisfaction (presence or absence of pain), amount of pain, and return of pain.

Steroid injections yielded better patient satisfaction compared with shoe modifications alone at 1 and 6 months. Twenty-three percent of shoe-modification patients achieved complete satisfaction at 1 month, compared with 50% of injection patients ( $P<.01$ ; number needed to treat [NNT]=3.7). At 6 months, the results were 28.6% satisfaction with shoe modification and 73.5% satisfaction with injection ( $P<.001$ ; NNT=2.3).

The difference disappeared at 1 year (63% satisfaction with shoe modification compared with 82% satisfaction with injection;  $P>.05$ ), although patients were allowed to cross over at 6 months. No complications occurred. The study was limited by a high rate of crossover from the shoe modification to the injection group at 6 months, elimination of dropouts from the final analysis, and lack of intent-to-treat analysis.

Another technique uses the sclerosing effects of alcohol<sup>6</sup> delivered by multiple ultrasound-guided injections over time.<sup>7,8</sup> Improvement of symptoms with no long-term adverse events were reported in several case series, although in each study a small number of patients reported localized pain at the site of injection.<sup>6-10</sup> The TABLE summarizes injection studies.<sup>5-11</sup>

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Stepped care, progressing from conservative measures to corticosteroid injections to surgery if necessary, seems reasonable.

# CLINICAL INQUIRIES

TABLE 1

## How injection therapies for Morton's neuroma compare

Study	Injection materials	Type of study	Number of cases	Average follow-up, (mo)	Average number of injections	Results
Greenfield 1984 <sup>9</sup>	Steroid	Retrospective case series	67	24	3	80% complete relief
Saygi 2005 <sup>5</sup>	Steroid	Prospective quasirandomized injection vs footwear modification	82	12	2-3	82% vs 63% complete or partial pain relief in 2 groups, respectively
Markovic 2008 <sup>11</sup>	Steroid*	Prospective case series	39	9	1	38% complete satisfaction and 28% satisfaction with minor reservations
Dockery 1999 <sup>6</sup>	Alcohol	Prospective case series	100	13	5.5	89% resolution or improved symptoms
Fanucci 2004 <sup>8</sup>	Alcohol*	Prospective case series	40	10	4	90% resolution or improved symptoms
Hughes 2007 <sup>7</sup>	Alcohol*	Prospective case series	101	21.1	4.1	94% resolution or improved symptoms
Mozena 2007 <sup>10</sup>	Alcohol	Retrospective case series	42	11	3-7	61% resolution or improved symptoms. Patients with ≥5 injections (74%) were more likely to respond ( <i>P</i> =.0072)

\*Ultrasound guided.

### Surgery:

#### Consider cost and risk of complications

Most surgical studies enrolled patients who had initially failed conservative treatments. Costs and risks of complications must be weighed, including infection, scar sensitivity, residual pain, sensory deficits, and other wound-related morbidities.

Technique varies considerably among surgeons.<sup>12</sup> A Cochrane systematic review of 3 randomized controlled trials comprising 121 patients concluded that, at most, very limited evidence exists that transposition of the transected plantar digital nerve may yield better long-term results than standard resection.<sup>3</sup>

In a retrospective case series, 82 patients with primary Morton's neuroma were treated by a single surgeon and a single technique (dorsal incision and nerve transection).<sup>13</sup> All patients had failed conservative man-

agement with orthotics, shoe modification, and NSAIDs (lidocaine injections were used only to pinpoint neuroma location). Sixty-six (81%) returned for follow-up.

Average follow-up evaluation was 5.8 years. Of the patients who were followed, 85% rated overall satisfaction as excellent or good.

#### Stepped care gets results

A prospective case series enrolled 115 subjects out of 340 consecutive patients who presented to a private orthopedic clinic with a diagnosis of Morton's neuroma.<sup>1</sup> The authors assessed a 3-stage protocol of stepped care, progressing to the next stage if improvement was inadequate after 3 months: Stage I comprised patient education, footwear modifications, and a metatarsal pad placed proximal to the involved nerve; stage II, injection of

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steroids with local anesthetic or local anesthetic alone; and stage III, surgery.

Of 57 patients treated only with footwear modifications, 47 (41%) improved and required no further treatment. Twenty-seven (47%) of the 58 patients who received injections improved and required no further treatment. Of the 24 patients who advanced to stage III, 96% improved with surgery.

### Recommendations

No consensus exists regarding definitive

treatment of Morton's neuroma. The American College of Occupational and Environmental Medicine recommends excision of the neuroma if nonsurgical treatment fails.<sup>14</sup>

A 2003 Cochrane systematic review of 107 studies found insufficient evidence to assess efficacy of surgical and nonsurgical interventions.<sup>3</sup> Stepped care has been adopted by many third-party payers who require conservative care before reimbursing for injections, and treatment with injections before reimbursing for surgery. **JFP**

### References

1. Bennett GL, Graham CE, Mauldin DM. Morton's interdigital neuroma: a comprehensive treatment protocol. *Foot Ankle Int.* 1995;16:760-763.
2. Wu KK. Morton's neuroma and metatarsalgia. *Curr Opin Rheumatol.* 2000;12:131-142.
3. Thomson CE, Gibson JN, Martin D. Interventions for the treatment of Morton's neuroma. *Cochrane Database Syst Rev.* 2004;(3):CD003118.
4. Kilmartin TE, Wallace WA. Effect of pronation and supination orthosis on Morton's neuroma and lower extremity function. *Foot Ankle Int.* 1994;15:256-262.
5. Saygi B, Yildirim Y, Saygi EK, et al. Morton's neuroma: comparative results of two conservative methods. *Foot Ankle Int.* 2005;26:556-559.
6. Dockery GL. The treatment of intermetatarsal neuromas with 4% alcohol sclerosing injections. *J Foot Ankle Surg.* 1999;38:403-408.
7. Hughes RJ, Ali K, Jones H, et al. Treatment of Morton's neuroma with alcohol injection under sonographic guidance: follow-up of 101 cases. *Am J Roentgenol.* 2007;188:1535-1539.
8. Fanucci E, Masala S, Fabiano S, et al. Treatment of intermetatarsal Morton's neuroma with alcohol injection under US guide: 10-month follow-up. *Eur Radiol.* 2004;14:514-518.
9. Greenfield J, Rea J Jr, Ilfeld FW. Morton's interdigital neuroma: indications for treatment by local injections versus surgery. *Clin Orthop Relat Res.* 1984;185:142-144.
10. Mozena JD, Clifford JT. Efficacy of chemical neurolysis for the treatment of interdigital nerve compression of the foot: a retrospective study. *J Am Podiatr Med Assoc.* 2007;97:203-206.
11. Markovic M, Crichton K, Read JW, et al. Effectiveness of ultrasound-guided corticosteroid injection in the treatment of Morton's neuroma. *Foot Ankle Int.* 2008;29:483-487.
12. Hassouna H, Singh D. Morton's metatarsalgia: pathogenesis, aetiology and current management. *Acta Orthop Belg.* 2005;71:646-655.
13. Coughlin MJ, Pinsonneault T. Operative treatment of interdigital neuroma: a long-term follow-up study. *J Bone Joint Surg Am.* 2001;83-A:1321-1328.
14. Clinical Practice Guideline Forefoot Disorders Panel, Thomas JL, Blich EL IV, Chaney DM, et al. Diagnosis and treatment of forefoot disorders. Section 3. Morton's intermetatarsal neuroma. *J Foot Ankle Surg.* 2009;48:251-256. Available at: [www.guideline.gov/summary/summary.aspx?ss=15&doc\\_id=15239&nbr=007479&string=morton](http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=15239&nbr=007479&string=morton). Accessed July 5, 2010.



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