

# THE ROLE OF DIAGNOSTIC BLOCK IN THE MANAGEMENT OF MORTON'S NEUROMA

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**OBJECTIVE:** To determine the outcome of surgical excision of Morton's neuroma after a local anesthetic diagnostic block into the neuroma has relieved symptoms.

**DESIGN:** A cohort study.

**SETTING:** A university affiliated hospital.

**PATIENTS:** A sequential series of 37 patients who underwent 41 excisions with at least 2 years' follow-up. Seven patients had undergone repeat excision of a neuroma, and 34 primary excisions were performed. Surgery was performed by a specialist in orthopedic surgery of the foot and ankle.

**INTERVENTION:** Excision of the Morton's neuroma after a positive diagnostic block.

**MAIN OUTCOME MEASURES:** Grade of symptoms at follow-up done by independent review on a 4-point scale.

**RESULTS:** Of 41 procedures, 11 had an unfavourable outcome: 4 procedures were graded 3, and 7 procedures were graded 4. Eight (24%) of the 34 primary procedures were reported as failures, and 3 (43%) of the 7 revision procedures were reported as failures. Most patients reported poor results owing to persistent pain.

**CONCLUSIONS:** Diagnostic blocks do not improve the results of surgery for excision of Morton's neuroma and are not recommended. Because failure rates are greater than 20%, surgery for Morton's neuroma should only be offered after a full course of nonoperative management.

**OBJECTIF :** Déterminer les résultats de l'excision chirurgicale du névrome de Morton après qu'un blocage diagnostique par anesthésie locale du névrome a soulagé les symptômes.

**CONCEPTION :** Étude des cohortes.

**CONTEXTE :** Hôpital affiliée à une université.

**PATIENTS :** Un série de 37 patients consécutifs qui ont subi 41 excisions et ont fait l'objet d'un suivi d'au moins deux ans. Sept patients avaient subi une excision répétée d'un névrome et l'on avait procédé à 34 excisions primaires. L'intervention chirurgicale a été pratiquée par un spécialiste en orthopédie du pied et de la cheville.

**INTERVENTION :** Excision du névrome de Morton après un blocage diagnostique positif.

**PRINCIPALES MESURES DE RÉSULTATS :** Grade des symptômes au moment du suivi effectué par un examinateur indépendant, sur une échelle de quatre points.

**RÉSULTATS :** Sur 41 interventions, 11 ont eu un résultat défavorable : quatre ont été cotées 3 et sept ont été cotées 4. Huit (24 %) des 34 interventions primaires ont été considérées comme un échec et trois (43 %) des sept interventions de révision aussi. La plupart des patients ont signalé des résultats médiocres à cause d'une douleur persistante.

**CONCLUSIONS :** Les blocages diagnostiques n'améliorent pas les résultats de la chirurgie dans le cas de l'excision du névrome de Morton et ne sont pas recommandés. Comme les taux d'échec dépassent 20 %, il faudrait offrir une intervention chirurgicale pour l'excision de Morton seulement après un éventail complet de traitements non opératoires.

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*Presented at the American Academy of Orthopaedic Surgeons meeting, Orlando, Fla., February 1995, and the Canadian Orthopaedic Association meeting, Halifax, NS, June 5, 1995*

*Accepted for publication Aug. 11, 1997*

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Morton's neuroma is a common clinical condition affecting mostly women. The treatment for this condition has been nonoperative for the initial stages of management, with operative intervention being performed if the symptoms persist. However patients who undergo surgery for Morton's neuroma have a 10% to 20% chance of failed surgery for a primary procedure, and between 20% and 40% failure for revision surgery.<sup>1,2</sup> Reasons for such failures include surgical technique (failure to excise the neuroma because of the wrong choice of web space or excision too distally), and misdiagnosis of the cause of the pain.<sup>2</sup>

Many recent papers have focussed on the role of various diagnostic modalities to assist in the assessment of Morton's neuroma. Apart from routine history-taking and physical examination, recent imaging investigations have included computed tomography,<sup>3</sup> magnetic resonance imaging<sup>4,5</sup> and ultrasonography.<sup>6,7</sup>

A diagnostic block using an injection of local anesthetic is simple and cheap. It is an instant test that is potentially diagnostic and in some cases therapeutic.<sup>8</sup> It allows correct identification of the web space involved and should confirm the diagnosis. We felt that the surgical results could be improved by using a diagnostic block to increase the accuracy of diagnosis of forefoot pain, but we could find no literature on the role of diagnostic block in the management of Morton's neu-

roma. We therefore reviewed our series of patients who underwent surgical excision of a Morton's neuroma after positive diagnostic block (i.e., symptoms were relieved) to see if the outcome was better than that in previously published series.

**METHODS**

All of the patients were assessed and operated on by one surgeon, an orthopedic foot and ankle specialist.

Between January 1986 and August 1989, 65 neuromas were excised: primary neuromas in 58 cases and recurrent neuromas in 7 cases. A total of 37 patients (28 women, 9 men) who underwent 41 procedures were followed up on average 48 months after surgery (range from 28 to 72 months), and these patients formed the basis of the study. Independent telephone interviews were performed at least 2 years after the procedure. Twenty patients could not be reached and 1 patient had died. They were excluded from the study.

The mean age of the 37 patients in the study group was 50 years (range from 23 to 75 years). Nineteen procedures were performed on the right side, 22 on the left. The procedure was performed on the third web space in 32 cases and on the second web space in 9 cases. The procedures were primary in 34 cases and secondary or more in 7 cases.

All patients were initially seen in the office, where a full history was obtained and physical examination per-

formed. Plain radiographs of the foot gave negative results in all cases.

The local anesthetic block was performed in the office after the procedure had been explained to the patient. One percent lidocaine hydrochloride without adrenaline (Xylocaine; Astra Pharma Inc., Mississauga, Ont.) was injected into the affected web space and the patient was asked to perform provocative activity. The patient was interviewed to report the results of the block several days later. The block was considered positive if the pain was relieved. The diagnostic block was positive in all patients.

All of the surgery was performed through a dorsal incision in a daycare setting with use of a tourniquet. The neuroma was sent for pathological examination. Care was taken to ensure that a proximal resection was performed. The wound was closed using absorbable suture material, and a soft dressing was applied. Activity was restricted for 4 weeks postoperatively. A similar procedure was performed for revision surgery except that a more proximal incision was used to allow identification of the common digital nerve outside the original scar.

At the time of the review the patients were asked to rate the outcome of the procedure. Pain was rated on a 5-point scale (none, some, less, same or more than preoperative pain). The scar was assessed according to tenderness and appearance. Function was assessed by walking distance in both running shoes and fashionable shoes. Footwear restriction was recorded. Further treatment was also recorded.

Patients were also asked to rate the subjective improvement on a 4-point scale: grade 1 reflected a completely satisfied patient who was pain free with no restrictions in activity and minor footwear restrictions; grade 2 described patients with minor residual web space pain, minor restrictions in

**Table I**

**Outcome After Excision of Morton's Neuroma in 41 Cases**

Procedure	No. of procedures	Grade, no. of excisions			
		1	2	3	4
Primary	34	26	0	2	6
Revision	7	4	0	2	1

activity and minor to moderate restrictions in footwear; grade 3 patients had mild or moderate residual pain, moderate restrictions in activity, major restrictions in footwear but an overall improvement; and grade 4 patients had pain the same or worse than preoperatively, major footwear restriction and would not consider undergoing the procedure again. Grades 3 and 4 were considered to represent failure of treatment. Statistical analysis of the differences was by Fisher's exact test, with  $p < 0.05$  being considered significant.

## RESULTS

Of 41 procedures, 11 (27%) were rated as unacceptable by patients at follow-up (Table I). Eight (24%) of the 34 primary procedures were reported as failures, and 3 (43%) of the 7 revision procedures were reported as failures. Of the 11 failures of surgery, 4 (36%) were graded 3 on the subjective improvement scale, and 7 (64%) were graded 4 on that scale. Of the successful procedures, 30 were graded 1 on the subjective improvement scale and none were graded 2. No failures occurred due to incorrect web space surgery.

Failure of surgery was usually due to pain. Of the 34 primary procedures, 23 were associated with no pain, 4 with some pain, 2 with less pain than preoperatively, 1 with the same pain and 4 with worse pain. Of the secondary procedures 4 had no pain, 1 less pain and 2 the same pain. In the failed surgery group of 11 patients, 4 had worse pain, 3 had the same pain, 3 had less pain and 1 had no pain. This last patient rated the operation poorly because of restricted shoe wear.

For the primary group, surgery was performed on the third web space in 29 cases, and on the second web space for 5 cases. Of the 8 failed primary procedures, all were performed on the third

web space. For the revision group, 4 procedures were performed on the third space, and 3 on the second. One second-space operation failed, and 2 third-space procedures failed. There was no relationship between the web space and outcome ( $p > 0.05$ ).

Postoperative shoe wear was unrestricted for 23 of the 34 primary surgery cases; 2 had to wear orthotics, 4 had limited shoe wear and 5 were only able to wear running shoes. In the revision group, 4 had unrestricted shoe wear, 2 had limited shoe wear and 1 was only able to wear running shoes. In the failure group, shoe wear was restricted after all procedures; 2 required orthotics, 3 were limited in shoe wear, 5 were restricted to running shoes and 1 refused comment. Of the successful surgical group, 24 were unlimited in their shoe wear, 4 were limited to running shoes, 1 wore orthotics and 1 could not wear ski boots.

For the primary procedures, 29 had no complaints about their scar, 3 complained of a tender scar and 2 reported that the scar was ugly. No patients in the revision group complained about their scars. The scar had little bearing on patient satisfaction, only 1 failed patient reporting a tender scar. The scar was acceptable in 32 patients, 2 thought the scar was ugly but rated the operation successful, and 3 reported tender scars.

Further treatment was sought by 4 patients who had failed procedures: acupuncture in 2, injections in 1 and ultrasound and injections in 1. One patient with a successful outcome had 2 injections into a painful scar.

All specimens were examined histologically. The findings were consistent with interdigital neuroma.

## DISCUSSION

In this study, we thought that by performing an intense preoperative

work-up with diagnostic block, 2 preoperative visits and surgery by a foot and ankle specialist, our results would be better than those previously documented.<sup>1,2</sup> We hoped to avoid the failures associated with technical errors, which are reported to account for up to 75% of failures, and to avoid errors associated with misdiagnosis.<sup>2</sup>

The results of surgery in this study are the same, if not slightly worse, than those reported in the literature.<sup>1,2</sup> The diagnostic block was not a reliable indicator of outcome. Of our 11 failed procedures, 10 reported failure due to pain. Four had worse pain than preoperatively, 3 had the same pain and 3 had less pain. The final patient reported that the operation was a failure due to changes in shoe wear.

The diagnostic block did not reduce the incidence of failures in Morton's neuroma surgery. We therefore believe that diagnostic blocks have no role in the management of Morton's neuroma, since they have no proven benefit and carry a risk of complications that include anaphylaxis. The diagnostic block may be misleading because of overlap analgesic effect for patients with metatarsalgia secondary to long-term fashion shoe wear. Self report (the surgeon performing the block rather than an independent doctor) may also play a role in some cases.

Morton's neuroma can be considered as a symptom of long-term dress shoe wear. High-heeled shoes force the metatarsophalangeal joint into hyperextension, bringing the junction of the nerve down under the transverse metatarsal ligament.<sup>9</sup> Advising patients to wear shoes with lower heels and wider toe boxes usually reduces the symptoms. The tight toe box of the shoe forces the metatarsal heads together crushing the nerve.<sup>2</sup> Primary treatment should therefore be nonoperative and should start by a change in shoe wear. Only when the

patient accepts the need to change shoe wear should any surgical procedure be considered.

As a result of this study we are much more conservative in our approach to the treatment of Morton's neuroma. Our premise that the high surgical failure rate was a result of misdiagnosis or poor surgical technique was false. Accordingly we have pursued an aggressive nonoperative regimen of modification to shoe wear, metatarsal pads, orthotics and short-term anti-inflammatory medication.<sup>6</sup> Surgery is offered only for failed supervised nonoperative care.

Greenfield, Rea and Ilfeld<sup>8</sup> investigated the outcome of nonoperative treatment of Morton's neuroma using local injection and shoe-wear modification. The majority (80%) of these patients reported complete resolution of symptoms at 2 years. In contrast, Gaynor and associates<sup>10</sup> reported poor outcome after nonoperative treatment of Morton's neuroma. Their nonoperative regimen consisted of taping and padding, orthoses, injections and wider

shoes. However, they only attempted conservative treatment in 12 of 65 patients studied, and no randomization was used. Only 8 single steroid injections were used, whereas 2 or more are usually needed to effect relief.<sup>8</sup>

Our operative rate on Morton's neuroma has fallen considerably as a result of our nonoperative treatment protocol. Most patients are satisfied with this approach and, when made aware of the surgical failure rate, they chose a nonoperative course.

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