

Letter Regarding: Minimally Invasive Dorsal Cheilectomy of the First Metatarsal: A Cadaveric Study / Clinical Outcomes Following Minimally Invasive Dorsal Cheilectomy for Hallux Rigidus

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Dear Editor:

We read carefully and with great interest both studies “Dorsal Cheilectomy of the First Metatarsal: A Cadaveric Study” by Teoh et al⁶ and “Clinical Outcomes Following Minimally Invasive Dorsal Cheilectomy for Hallux Rigidus” by Teoh et al.⁷ They performed 2 interesting studies based on cadaveric and clinical results regarding the minimally invasive dorsal cheilectomy (MIDC) for the treatment of hallux rigidus. The authors made a great contribution to a subject that was almost unpublished and will be useful for the creation of new studies. However, we have some considerations to make.

Regarding the clinical paper,⁷ the authors mentioned that it was imperative to avoid injury to the dorsomedial cutaneous nerve (DMCN) of the hallux when doing an MIDC. They marked this nerve on patients if palpable before placing the incision.⁷ Although this procedure may be efficient in some patients, alternative methods may be used in those where it is not possible to mark them. Some of them may be related to studies that have measured the distance between minimally invasive surgery (MIS) portals and anatomical structures.^{2,4,5,9} Thus, surgeons can more accurately assess the risk of injury, especially in small neurologic structures.

The authors correctly described the complications of the technique in both studies.^{6,7} In the cadaveric one, dissection of the specimens revealed that the DMCN was completely sectioned in two specimens (15%). Also, the extensor hallucis longus tendons were intact, although in one specimen the tendon showed some fraying on the underside (estimated to be 15%).⁶ We think the methodology and therefore the conclusions of the study are not entirely correct, and we have some comments to make on this:

1. One of the most important issues in MIS is to perform an only-skin incision and then a blunt dissection straight to the bone, to avoid nerve injuries. This is not explained in the study. We think that a correct technique was not performed, which could explain the high index of iatrogenic nerve lesion.

2. It is stated that they do not know whether the cut of the nerve was produced by the blade or by the burr. We think this is a serious mistake, as anyone using burrs knows that these instruments are designed to stop progression when they are in contact with soft tissues, as explained by the manufacturers and also explained in some studies.³ Burrs work in the same manner that an oscillating saw for cast removal does (cutting the cast but not the skin of the patient). Burrs cut or abrade the bone, but do not section soft-tissues (otherwise, MIS would be impossible to perform with these instruments).
3. During anatomical dissection, they opened a window and dissection was performed from distal to proximal to find the nerve. In our opinion, this is an incorrect dissection technique for neurological or vascular structures, as it is very easy to inadvertently cut them. When dissecting neurovascular structures, dissection has to be advanced from proximal to distal to avoid disrupting structures. We think this might be the reason why two nerves were found injured, and therefore this is unrelated to the surgical technique but a direct consequence of an incorrect dissection technique.

When observing the clinic study, the authors mentioned that two patients (2%) had transient nerve paresthesia and another two (2%) patients had permanent hypoesthesia in the DMCN distribution.⁷ Although the incidence of this clinical complication is low, neuropathic sequelae can greatly alter the quality of life of patients. In both studies,^{6,7} the authors omitted to mention or did not take into account the position of the metatarsophalangeal joint when performing the MIDC (It seems neutral or 0 degrees on study). This represents a risk factor for damage of dorsal anatomical structures. Some studies mention that joint position greatly influences position of the nerves, increasing the working space area and reducing the risk of complications.^{1,8} It seems quite reasonable that this concept could be transferred when performing an MIDC with the aggravating

circumstance that the working space area is considerably reduced by the condition itself (Dorsal osteophyte).

We believe passive dorsiflexion—when doing dorsal capsular release in MIDC—may prevent complications when doing minimally invasive hallux rigidus operative approaches. A possible solution for this topic could be to perform a study to describe the best position for this procedure, both for safety and feasibility.

Finally, we would like to point out that our reason to write this letter was to call attention to the fact that extreme care needs to be taken when new techniques like minimally invasive or percutaneous procedures are being assessed. Biased results or incorrect conclusions, sometimes due to incorrect methodologies, may discourage young surgeons to start performing such techniques, which ultimately make evolution difficult and prevent patients from benefiting from the most advanced surgical techniques.

Jorge Javier Del Vecchio, MD 

Head Foot and Ankle Section, Orthopaedics Department,
Hospital Universitario - Fundación Favaloro,
Buenos Aires, CP, Argentina
Department of Kinesiology and Physiatry, Universidad
Favaloro, Buenos Aires, CP, Argentina
Email: javierdv@mac.com

Olivier Laffenetre, MD


Institut de la Cheville et du Pied, Paris, France
Centre Médico-chirurgical Universitaire du Pied. CHU
Pellegrin, Bordeaux, France

Eric Daniel Dealbera, MD 

Foot and Ankle Surgery and Limb Salvage Fellowship,
Foot and Ankle Section, Orthopaedics Department,
Hospital Universitario - Fundación Favaloro,
Buenos Aires, CP, Argentina

Julien Lucas, MD

Centre Médico-chirurgical Universitaire du Pied, CHU
Pellegrin, Bordeaux, France Board member, GRECMIP
- MIFAS (Groupe de Recherche et d'Etude en Chirurgie
Mini-Invasive du Pied - Minimally Invasive Foot and
Ankle Society), Merignac, France

Miki Dalmau-Pastor, PhD 

Human Anatomy and Embryology Unit, Faculty of
Medicine and Health Sciences, Hospitalet de Llobregat,
University of Barcelona, Spain
Vilamèdic Medical Center, Santa Coloma de Gramanet,
Barcelona, Spain
GRECMIP - MIFAS (Groupe de Recherche et d'Etude en
Chirurgie Mini-Invasive du Pied - Minimally Invasive Foot
and Ankle Society), Merignac, France

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ORCID iDs

Jorge Javier Del Vecchio, MD,  <https://orcid.org/0000-0001-5263-7626>

Eric Daniel Dealbera, MD,  <https://orcid.org/0000-0001-5684-3902>

Miki Dalmau-Pastor, PhD,  <https://orcid.org/0000-0001-6043-698X>

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