

Minimally Invasive Forefoot Surgery in France



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KEYWORDS

- Forefoot surgery • Minimally invasive technique • Hallux valgus
- Metatarsal osteotomy • Arthrodesis • Morton neuroma

KEY POINTS

- Minimally invasive forefoot surgery is a modern concept that should be considered primarily as an efficient technical evolution of classical surgery.
- The improvement of the understanding of pathologies associated with a patient perpetual evolution of surgery facilitates the development of new concepts.
- The goal of minimally invasive surgery remains an improvement of results for the postoperative patient with functional optimization and early walking.

INTRODUCTION

For the past 25 years, forefoot surgery has been dramatically changing in France. The technical methods that concerned tendons, ligaments, and envelopes have spread to the bone itself. Before 1980, surgery was mostly practiced on the soft structures, consisting of mechanically stretching the distended elements located in the convexity and extending or cutting what was retracted into the concavities. Soft tissue interventions, such as the McBride and Peterson procedures, were used when the bone was healthy, and if the bone was sick, articular sacrifices, bone resections (as the base of the first phalanx [P1] of the hallux), or complex and stiffness bone surgeries, including the inferior Schnepf procedure, were then realized.

Pathophysiologically, the medial projection in hallux valgus is primarily related to the angulation of the first metatarsal (M1) (metatarsus varus), with the proximal phalanx of the hallux (P1) associated with the phenomena of pronation and elevatus. Efforts seeking to reduce the deformity by tensioning the soft parts is doomed to failure. The first in France to popularize mechanical logic of M1 relaxation osteotomy was Patrice Diebold¹: he brought back from the United States, in the 1980s, the “V” distal epiphyseo-metaphyseal osteotomy of the first metatarsal called “chevron.” Shortly before, he had started the first phalangeal osteotomies.

The authors have nothing to disclose.

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Later, in the early 1990s, Samuel Barouk discussed in France the diaphyseal osteotomy of the first metatarsal (M1), called scarf.² This surgery was widely circulated in France and became the gold standard for correction of hallux valgus.

Gradually, surgical methods were increasingly developed with improvement of surgical technique itself even with respect for the bone environment and for the neighboring soft tissues on the bigger toe and on the lateral rays.³

Minimally invasive surgery and the use of a mini skin incision should not be confused. The length of the scar can certainly be important in terms of esthetics for the patient, but it does not define the quality of surgery realized in depth. For us, the real minimally invasive surgery is the one that respects the profound anatomic elements (vascularization, muscles, tendons, ligaments, capsule, bones) and that provides sufficient visibility to safely realize the surgical gesture, without abusing the skin, where nearly all infections originate. Furthermore, the quantity of material of osteosynthesis and its volume also participate in this concept of minimally invasive surgery.

Rather than writing long descriptive phrases, we describe our minimally invasive surgical techniques in the surgery of the forefoot.

HALLUX VALGUS: MAESTRO'S MODIFIED SCARF OSTEOTOMY OF THE FIRST METATARSAL, OUR TECHNIQUE

Scarf osteotomy of the first metatarsal bone to correct hallux valgus deformity has benefited from a number of improvements over the past 2 decades, most notably regarding the internal fixation method.⁴⁻¹⁰ Maestro suggested eliminating the proximal screw by locking the 2 fragments distally: a notch was created via a medial extension of the cephalic part of the osteotomy, the plantar fragment was displaced laterally, and the distal end of the proximal fragment was then fit into the notch (secondary cut and interlocking joint technique). To further develop this concept and to increase the potential range of translation, an original technique was developed involving distal locking without shortening and proximal stabilization by impaction of a cortical-cancellous bone graft taken from the medial overhanging edge of the proximal fragment. It requires no screws for internal fixation.

A short medial incision is made next to the metatarsophalangeal articulation of the first ray. Careful hemostasis of blood vessels is performed to reduce postoperative bleeding and to reduce hemorrhagic complications and especially reduce postoperative edema. The dissection is continued until the joint capsule. It is realized that a neurolysis of the dorsal sensory nerve in the plane of the joint capsule would lessen suffering and avoid its suture during the capsular closure (Fig. 1).

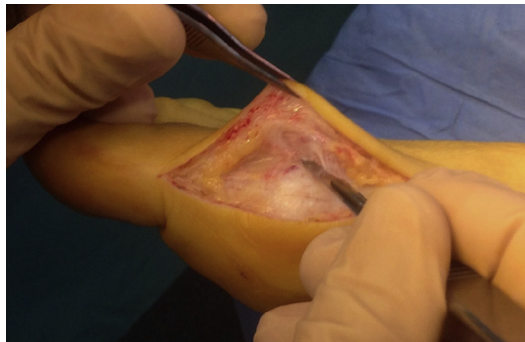


Fig. 1. Skin medial incision and dorsal sensory nerve neurolysis.

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