

Special Article

Surgical treatment in hallux rigidus: dorsal cheilectomy and Moberg osteotomy

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Abstract

Dorsiflexion osteotomy of the proximal phalanx of the hallux was popularized by Moberg. The combination of this technique with dorsal cheilectomy of the first metatarsal head showed good results in the surgical treatment of both mild and severe hallux rigidus. In our opinion, the combination of both techniques is the first choice for the surgical treatment of hallux rigidus.

Level of Evidence V; Case Report; Expert Opinion.

Keywords: Hallux rigidus; Osteotomy; Metatarsophalangeal joint.

Introduction

In 1952, Bonney and Macnab⁽¹⁾ suggested first phalangeal osteotomy for the treatment of hallux rigidus in adolescents with no major osteoarthritis involvement on the first metatarsophalangeal joint (MTPJ). Later, in 1958, Kessel and Bonney⁽²⁾ published the first results of the technique. However, Moberg⁽³⁾, in 1979, was the one who popularized this procedure by expanding its indication to adult patients.

Osteotomy partially defunctionalizes the MTPJ by reducing the lever arm during the takeoff phase of gait. In a cadaver study, Kim et al.⁽⁴⁾ observed that, although this osteotomy does not reduce pressure on the joint, it leads to plantarization of the point of contact between the phalangeal base and the metatarsal head. This could partly explain patients' symptomatic improvement, considering that the dorsal region of the joint is the most affected one.

Currently, this osteotomy is rarely performed alone. The most frequent combination is that with first metatarsal dorsal cheilectomy, which was first described in 1959 by Du Vries⁽⁵⁾. This procedure consists of resecting part of the dorsum of the first metatarsal head and periarticular osteophytes.

However, the first results with these techniques combined were only presented in 1998, by Blyth et al.⁽⁶⁾

The combination of both techniques at the same surgical time does not increase morbidity, maintain MTPJ mobility,

allow for early weight-bearing and functional rehabilitation, and does not shorten the metatarsal neither change the bone stock, considering a possible revision surgery (Figure 1).

Indications and contraindications

This procedure is usually indicated in early stages of hallux rigidus (grades 1 and 2 of Coughlin and Shurnas classification), ie, in patients with mild to moderate MTPJ pain, who have preserved joint mobility, and who does not present with major radiographic involvement⁽⁷⁾. However, it is also an alternative in grades 3 and 4, with excellent results, but care should be taken in patient selection. Age, type of activity patients perform, their footwear, and preoperative mobility are more important factors than radiographic findings at the time of treatment decision making.

Short female patients who usually wear high-heel shoes deserve further analysis, as well as young athlete patients that require good MTFJ mobility for their sports practice. In these cases, we believe that cheilectomy combined with Moberg osteotomy is the surgical treatment of choice, even in advanced stages.

Dorsomedial wedge osteotomy (Akin-Moberg osteotomy) of the proximal phalanx also enables to correct mild valgus deviations, especially interphalangeal valgus⁽⁸⁾.

Study performed at the Sanatorio Finochietto, Buenos Aires, Argentina.

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Surgical technique and postoperative management

Surgery is performed with regional ankle block. The patient is placed in the supine position on the surgical table with hemostatic cuff on the ankle. Medial approach to the hallux is achieved by with divulsion of the soft tissues until reaching the articular capsule, which is usually thinned. Capsulotomy is performed to widely release the joint. Approximately 30% of the dorsum of the metatarsal head is resected in the oblique direction from proximal to distal and from dorsal to plantar, in addition to osteophytes at the proximal phalangeal base. If there are adherences at the plantar region with the sesamoids, they are gently released using a blunt curette in order to achieve a greater dorsiflexion range of motion. Next, proximal phalangeal osteotomy is performed by resecting a dorsal wedge and preserving

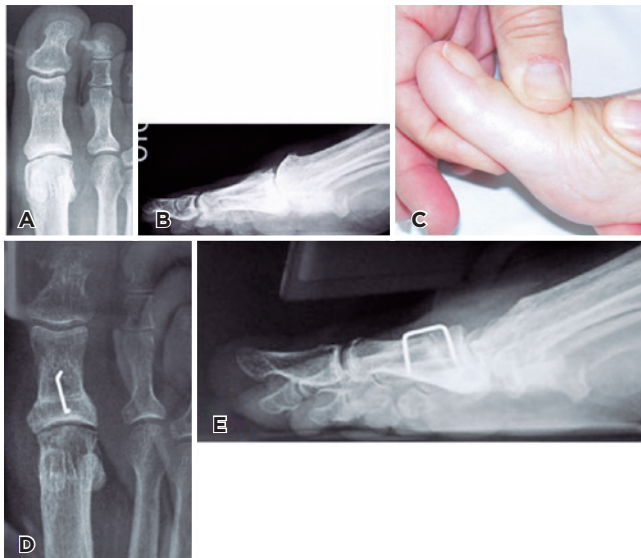


Figure 1. Images from a patient with symptomatic hallux rigidus. Front (A) and profile (B) radiographies and dorsiflexion range of motion (C). Postsurgical front (D) and profile (E) radiographies.

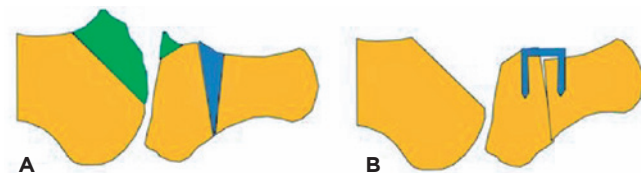


Figure 2. Sagittal scheme of the first metatarsophalangeal joint. The green area shows the portion of the metatarsal head (approximately 30%) and of the proximal phalanx that should undergo resection. The blue area shows dorsal subtraction wedge (measuring approximately 3mm). A). Immediate postoperative image of dorsal cheilectomy and Moberg osteotomy with clamp fixation (B).

the cortical plantar surface (osteoclasia), which will provide greater stability and prevent shearing. Osteotomy is closed and fixed with a 10-mm clamp (Figure 2). Execution of dorsomedial osteotomy also makes it possible to simultaneously correct interphalangeal valgus.

Capsulorrhaphy is conducted with the attempt of not exerting too much strength, which could stiffen the joint. The skin is then closed, and drainage and dressing are installed.

Postoperative shoes are used over dressings, and patients are allowed to perform immediate weight-bearing. Drainage removal occurs 24 hours after the procedure. Non-absorbable stitches are removed after 10 days, and passive mobilization of the MTPJ is initiated. Orthopedic footwear is removed on the second postoperative week or before, according to tolerance, and full weight-bearing with comfortable shoes is allowed.

Discussion

Our first experience with this procedure was in young patients with mild hallux rigidus (grades I and II). The results with these patients encouraged us to expand the indication to older patients and with more advanced grades of disease. Currently, this is the procedure most usually performed for the treatment of hallux rigidus, especially in active patients. Although radiographic progression of the lesion is a common phenomenon in the medium and long term, this does not coincide with clinical manifestation and rate of conversion to metatarsophalangeal arthrodesis is low.


Thomas and Smith⁽⁹⁾ retrospectively assessed the results of Moberg osteotomy combined with cheilectomy in 24 feet, with a mean follow-up of 5 years, showing that 96% of patients would undergo the same procedure and did not report complications.

O'Malley et al.⁽¹⁰⁾ reported their results in 84 feet with severe hallux rigidus, with a mean follow-up of 4 years, and found that 85% of patients were satisfied, and 4 procedures underwent revision with metatarsophalangeal arthrodesis.

In 2010, Roukis⁽¹¹⁾ presented a meta-analysis of 11 studies covering a total of 374 feet treated with Moberg osteotomy and dorsal cheilectomy. The author found that 77% of patients reported being satisfied, and that pain was relieved or improved in 89% of procedures. Moreover, AOFAS scores improved by 39 points, and 4.8% of procedures underwent surgical revision with arthrodesis.

Conclusion

According to our work group, the association of cheilectomy with Moberg osteotomy is the first choice for the surgical treatment of hallux rigidus, both in initial and advanced stages. Patients' age, the type of activity they perform, and preoperative mobility are essential factors in treatment decision making.

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