

Case Report

Post-traumatic hallux varus: treatment using the mini endobutton technique

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Abstract

Hallux varus is an uncommon involvement in the orthopedic routine and consists of the medial deviation of the hallux from the first metatarsal. In this paper, we report a 45-year-old female patient who arrived at the health service after suffering trauma in the right foot. The patient developed a deformity when presenting a hallux varus post-traumatic, requiring surgical intervention. The mini endobutton technique was applied, presenting advantages over other surgical strategies because it promoted the functional and aesthetic rehabilitation of the patient.

Level of Evidence V; Therapeutic Studies; Expert Opinion.

Keywords: Hallux varus; Hallux valgus; Orthopedic fixation devices; Trauma.

Introduction

Hallux varus is a rare pathology⁽¹⁾, and in most cases, it affects women⁽²⁾ without hereditary tendency. The most frequent cause is the hypercorrection of hallux valgus (bunion) in surgical procedures⁽³⁾ and due to trauma in the region. Approximately 1% to 1.6% of surgical procedures for hallux valgus may evolve with varus deformity⁽³⁾. The most common orthopedic manifestation of the hallux varus is based on the tripod: medial deviation of the hallux, supination of the phalanx, and interphalangeal flexion (claw toes deformity)⁽²⁾.

The patient with this involvement in the anamnesis has difficulty wearing shoes and has aesthetic impairments, gait disorders, and pain when there is trauma or arthritis. Treatment may be conservative, but when symptomatic, it is poorly responsive, requiring surgical treatment. Thus, it can be surgically corrected through techniques such as medial

capsulotomy, lateral reinforcement with tendon transfer, Kirschner wire placement after a transverse capsulotomy, and proximal phalanx exposure, such as closed wedge osteotomy of the proximal phalanx⁽⁴⁾, with the medial axis. The prognosis is usually favorable⁽¹⁻⁷⁾.

Case report

A 45-year-old female patient in good health condition arrives at the health service and reports functional limitation, mainly pain in the topography of the first right metatarsophalangeal joint for about two months.

However, this was due to a previous fracture in the region, in which conservative treatment was performed using a plaster cast immobilization. Physical examination showed a hallux varus deformity, and the classic tripod of this disease was identified (Figure 1).

Study performed at the Hospital dos Servidores do Estado de Pernambuco, Recife, PE, Brazil.

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Given the condition, imaging tests were requested to evaluate the prognosis and decide on the best management for the patient. Initially, a fracture of the lateral base of the proximal phalanx of the right hallux was observed on anteroposterior and profile radiographs (Figure 2).

Nuclear magnetic resonance imaging was requested to visualize the affected structures better. Degenerative changes were evidenced, involving the joints with slimming of the chondral surfaces (Figure 3). In addition, area of synovitis and a small bone fragment from the lateral base of the proximal phalanx. Based on these findings and the clinical history, the surgical team decided on surgical treatment through the mini endobutton technique.

The surgery consists of two incisions—one dorsolateral and one medial—to expose the lateral base of the proximal phalanx and the distal region of the first metatarsal. Then, the extensor hallucis longus and medial capsulotomy were released (Figure 4).

Then, the 1.2 mm guidewires were inserted at an angle of about 40-50 degrees oblique after cannulation was performed with drills for anatomical reduction and correction of deformity in the distal region of the first metatarsal and proximal phalanx of the hallux, with fixation through the mini endobutton.

Discussion

The aim of this post-traumatic hallux varus case report was to describe this deformity and the mini endobutton technique, as a surgical strategy, for repairing the lateral

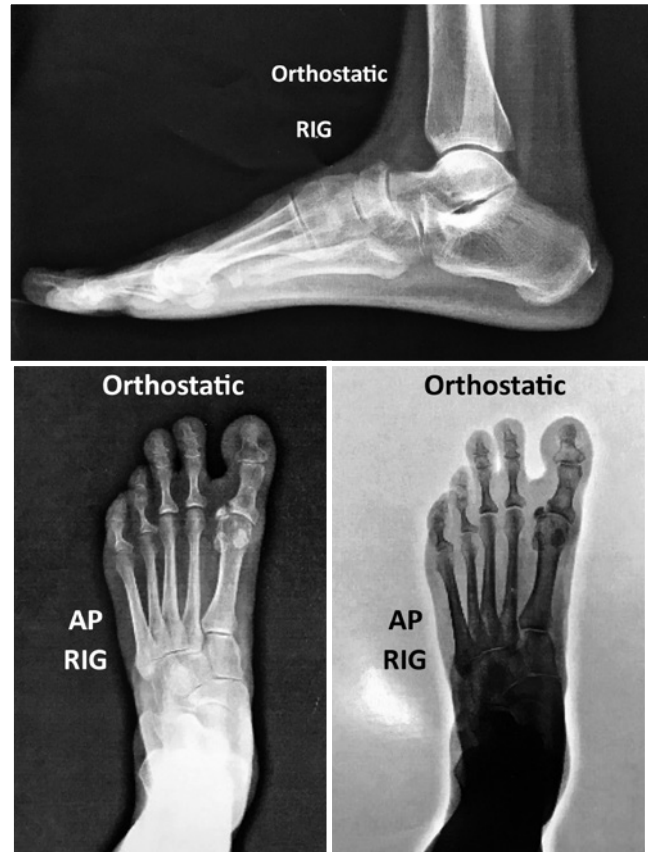


Figure 2. Anteroposterior and profile radiographs.



Figure 1. Immediate preoperative.



Figure 3. T-1 weighted magnetic nuclear resonance.

collateral ligament of the hallux. Such pathology is rare in the orthopedic routine, and because it shows a post-traumatic fact, it further increases its uniqueness and significance⁽¹⁾. The hallux varus represents a sinuosity of the hallux in the medial direction⁽⁴⁾. The main etiology is the surgery to repair the hallux valgus (bunion)⁽⁷⁾, congenital⁽²⁾, and trauma in the region.

Its main cause is an iatrogenic hypercorrection of the hallux valgus, which is quite common in postmenopausal women⁽³⁻⁷⁾, mainly in patients with long-standing osteoarthritis, with congenital and neurological causes (post-polio). In older adults, hallux varus is a risk factor for falls and subsequent loss of functionality.

Due to its diverse etiologies and clinical presentations, the hallux varus classification is not easily reproducible. Hawkins classified the deformity as static (flexible) or dynamic (rigid). Static deformity is commonly asymptomatic, of uniplanar characteristic, reducible, and not caused by a muscle imbalance. Dynamic deformity is commonly symptomatic, multiplanar, and non-reducible, usually due to a muscle imbalance⁽⁸⁾.

Surgical treatment should be indicated according to clinical and radiographic evaluation. Several surgical procedures are capsular repairs, tenotomy and/or abductor hallucis transfer, extensor hallucis longus transfer and hemitransfer, osteotomies, and arthrodeses. There is no consensus on the surgical treatment of choice, and each case should be evaluated individually. Historically, flexible deformities without degenerative joint changes can be treated differently, including bloodless reduction and fixation with Kirschner wires in recent cases, excision tibial sesamoid, or metatarsal and phalangeal osteotomies. However, soft tissue procedures such as medial capsular release, lateral capsuloplasty, abductor hallucis tenotomy, transfers, and tenodeses are described with better results in these deformities⁽⁹⁾.



Figure 4. Medial incision with varus correction using the mini endobutton technique.

The choice of procedure should be individualized based on the etiology of the deformity, anatomy, objectives, and patient perspectives. In late flexible deformities, there is no evidence that only medial capsular release, lateral capsular overrelease, and abductor hallucis tenotomy are sufficient⁽¹⁰⁾. In such cases, tendon transfers are indicated. Several procedures are described as extensor hallucis longus transfers and hemitransfer, abductor hallucis transfers, and extensor hallucis brevis tenodesis⁽¹¹⁾. There are also new procedures for reconstructing the lateral collateral ligament by the mini endobutton device to correct the hallux varus presenting satisfactory results⁽¹⁰⁾.

Nevertheless, the mini endobutton technique is progressively effective in treating post-traumatic hallux varus, presenting better prognostic results among the patients submitted⁽⁶⁾. Mini endobutton treatment is a reproducible technique that allows the treatment of hallux varus, achieving the same correction of osteotomies but preserving and avoiding complications, which may resemble less invasive percutaneous techniques⁽¹²⁾ (Figure 4 and 5).

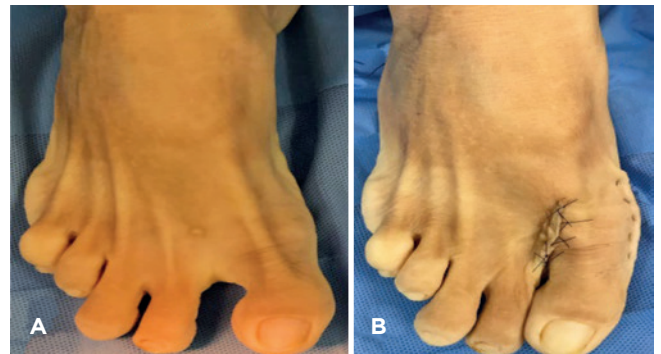


Figure 5. Hallux appearance. A) Preoperative; B) Immediate postoperative.

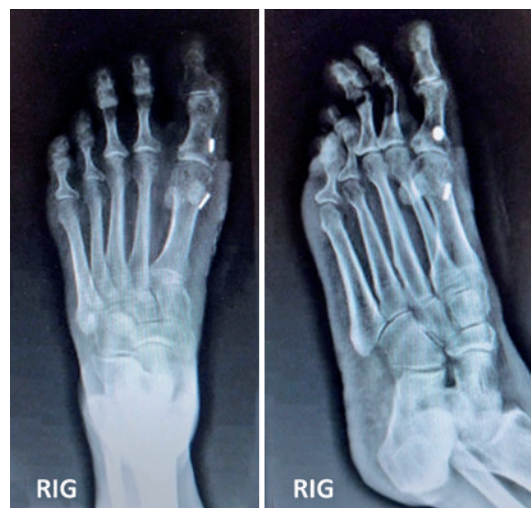



Figure 6. Anteroposterior and oblique postoperative radiographs.

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