

The Treatment of Iatrogenic Hallux Varus

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KEYWORDS

• Hallux varus • Iatrogenic • Tenodesis • Corrective osteotomy

KEY POINTS

- Though uncommon, iatrogenic hallux varus is most often the result of overresection of the medial eminence, overtranslation of an osteotomy, overrelease of the lateral soft tissues, or overtightening of the medial tissues.
- Iatrogenic hallux varus is not always symptomatic, as the degree of deformity can be well tolerated.
- For soft-tissue reconstructions, releases have little role to play unless minor deformity is detected early on and the longevity of tendon transfer and tenodesis remains unknown.
- For bony reconstruction, arthrodesis is the recommended salvage technique.

INTRODUCTION

Hallux varus is a deformity characterized by medial deviation of the great toe secondary to an imbalance of the musculotendinous units that cross the first metatarsophalangeal joint (MTPJ). Though rare, hallux varus can present in adolescence as a result of an underlying neuromuscular imbalance such as a hereditary sensorimotor neuropathy or in postpolio syndrome. In addition, it may occur secondarily to trauma to the lateral capsular structures of the first MTPJ or to the attenuation of the joint capsule secondary to inflammatory joint diseases. However, the most common cause of hallux varus is iatrogenic, particularly after corrective surgery for hallux valgus, with a reported incidence varying from 2% to 13%.^{1–3} There is a strong preponderance in women, with a mean age at presentation of 45 to 50 years.^{4,5} Patients may complain of pain, difficulty with fitting footwear, unacceptable cosmesis, or functional impairment with associated instability and weak toe pushoff.^{6–9} Some investigators have noted that the deformity can be well tolerated by patients over the longer term.¹⁰

Historically, the McBride procedure has been frequently implicated because of the destabilizing effects of releasing the insertion of the adductor hallucis, often in conjunction with excision of the lateral sesamoid.^{6–8,11–14} This process causes the varus deformity as a consequence of the unopposed pull of abductor hallucis together

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with the medial head of flexor hallucis brevis. Further imbalance of the toe extensors and the flexor hallucis longus can lead to a hyperextension deformity at the first MTPJ with a flexion deformity of the interphalangeal joint (IPJ). Other documented surgical procedures that have led to iatrogenic hallux varus as a complication include Keller-Brandes,^{6,8,10,11} scarf,^{3,14} Petersen,^{8,13} distal,^{6,15} and basal osteotomies,^{10,16} and the Lapidus procedure.¹⁷ Other than McBride procedures, essentially any excessive resection of the medial eminence, overcorrection of intermetatarsal angle with an osteotomy, release of the lateral soft tissues, or plication of the medial tissues in any combination risks the development of hallux varus.

CLASSIFICATION AND TREATMENT

An ideal classification system acts as a reliable and reproducible tool that can be used both practically, in terms of an accompanying treatment algorithm, and in terms of permitting comparable groups for research. However, for iatrogenic hallux varus no such classification exists, as each deformity is uniquely dependent on the degree and nature of the iatrogenic insult. Donley¹⁸ attempted to classify acquired hallux varus in 2 ways: firstly by dividing hallux varus into static and dynamic deformities, and secondly by considering the axial and sagittal plane deformities at both the MTPJ and the IPJ. However, this article considered all causes of acquired hallux varus rather than focusing on iatrogenic causes. Similarly, classifying hallux varus according to whether the deformities are fixed or flexible may be oversimplistic, particularly when there is a wide variety of surgical treatment described within the literature.⁹ Previously described surgical guidelines⁹ and treatment algorithms⁶ are not easy to follow, and may not include all treatment options for every individual scenario.

An attempt has been made to specifically classify the etiology of iatrogenic hallux varus into 4 distinct groups by the underlying dominant surgical insult responsible for the deformity.⁸ This classification is possibly an oversimplification, especially in the presence of a combination of causes, and therefore a treatment algorithm may not be applicable.

CLINICAL EXAMINATION AND INVESTIGATION

Inspection of the patient's foot while standing and bearing weight reveals the severity of the varus deformity at the first MTPJ. In addition, deformity at the IPJ can be observed as well as any associated hyperextension or rotation at the first MTPJ. Other information such as previous surgical wounds and the health of the soft-tissue integument can also be ascertained.

With the patient seated, the first MTPJ and IPJ can be assessed for fixity, flexibility, reducibility, discomfort, and crepitus. Flexible and reducible deformities may be considered for joint-preserving surgical treatments, whereas painful and stiff joints with crepitus may be best treated with arthrodeses.

Plain orthogonal standing radiographs demonstrate the health of the first MTPJ and IPJ including congruency. In addition, sequential plain films may reveal progressive joint destruction and osteomyelitis as the cause of iatrogenic hallux varus in cases of suspected deep sepsis. Magnetic resonance imaging may help determine the extent of infection in these latter cases, and can have a role in suspected avascular necrosis of the first metatarsal head.

NONOPERATIVE TREATMENT

It is accepted that early recognition of iatrogenic hallux varus allows the surgeon a window of opportunity to manage the deformity without the need for further surgery.^{6,7}

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