

REVISIONAL HALLUX VALGUS SURGERY: Evaluation and Principles of Salvage

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The first metatarsophalangeal joint (MTP) joint is quite complex. The function of the first MTP joint is affected by torsional conditions of the hip, lower leg, ankle, and hindfoot. The first MTP joint is subjected to a variety of environmental forces that can adversely affect its function. Given the complexity of this joint, it is not surprising that complications are not uncommon following hallux valgus reconstruction.

Numerous complications can occur following hallux valgus reconstruction. These complications include infection, wound healing, nerve entrapment or neuritis, metatarsalgia, avascular necrosis, delayed union or nonunion, painful or limited range of motion, hallux varus, and recurrence. The most common complication is recurrence. There are several reasons why primary procedures for hallux valgus reconstruction fail. Selecting an inappropriate procedure, addressing a deformity that is too severe for a specific procedure, and poor technical execution are some of the reasons for recurrent deformity.

Revisional hallux valgus surgery is often challenging. It is important to keep in mind that these cases are very unique. The more complex the complication, the more complex the salvage. Unfortunately, results are not always predictable. Additionally, the procedures that are typically required to address recurrent deformities often require extended postoperative convalescence. Salvage procedures must address all elements of the deformity. Revisional surgery must be comprehensive and thorough. This is the most critical factor relative to outcomes with revisional hallux valgus surgery. These patients present not only with recurrence but often with other problems as well. Although recurrence is present and certainly of concern, these patients also present with lateral forefoot overload, second MTP joint symptoms, first-rate elevation, nonunion, shortening of the first metatarsal, etc. As such, revisional surgery can be difficult (Figure 1).

A thorough workup and evaluation will clearly define the problem. Standard evaluation should include a history with special emphasis on patient symptoms, a thorough physical examination, and an appropriate radiographic assessment. The patient's chief complaint and primary symptoms must be addressed. It is important to note what

type of previous surgery the patient has undergone. It is also important to note comorbidities, social history, compliance, and expectations. Obviously, expectations must be realistic for both the patient and surgeon.

The physical examination should be detailed and specific. This examination should be comprehensive, evaluating not only the forefoot, but the hindfoot and the remainder of the lower extremity as well. It is especially important to note conditions that are typically associated with recurrence. Some of these conditions might include metatarsus adductus, equinus, hindfoot malalignment such as flatfoot deformity, and any type of spasticity or elasticity. A comprehensive assessment of the first ray should be performed. This should include evaluation of the tarsometatarsal joint, MTP joint, soft tissue contractures, and the sesamoids.

Unrecognized hypermobility or excess motion of the first tarsometatarsal joint has been associated with recurrent hallux valgus deformity. Preoperative evaluation in patients with recurrent hallux valgus revealed 96% of patients had clinical hypermobility of the first tarsometatarsal joint and 52% had radiographic findings of instability (1-2). The MTP joint should be evaluated for degree and quality of motion. One should ascertain if motion is pain-free and supple versus painful with crepitus. It is also important to evaluate the ability to realign the hallux. Some deformities are so severe and soft tissues so contracted that it is virtually impossible to completely reduce the deformity. These cases present a special challenge because, although the first MTP joint motion may be smooth and supple, complete realignment is not possible. These cases may not be amenable to joint sparing procedures. Arthrodesis of the first MTP joint is often the only way to obtain adequate long-term reduction.

Radiographic assessment should include evaluation of the first MTP joint, specifically identifying signs consistent with degenerative joint disease. It is also important to evaluate the first metatarsal head for possible avascular process, especially if there is associated limitation of first MTP joint motion following a distal metatarsal osteotomy. One may consider advanced imaging if avascular necrosis is in the differential diagnosis. Radiographic assessment should



Figure 1A. Antero-posterior radiograph showing recurrent hallux valgus, nonunion of the first tarsometatarsal joint, and first ray elevation.



Figure 1B. Lateral radiograph showing recurrent hallux valgus, nonunion of the first tarsometatarsal joint, and first ray elevation.



Figure 1C. Postoperative radiograph of revision that included hallux valgus repair, revision of nonunion, and medializing posterior calcaneal osteotomy.



Figure 1D. Postoperative radiograph of revision that included hallux valgus repair, revision of nonunion, and medializing posterior calcaneal osteotomy.

also include the degree and location of malalignment, shortening following osteotomy or arthrodesis, nonunion, malunion, location and type of fixation, width of the first metatarsal head, deformity within the hallux, and lesser MTP joint pathology.

Revisional hallux valgus surgery must be detailed with emphasis on the patient's primary complaint and must address all pathologic elements. Surgical goals should include restoration of bony alignment, restoration of joint congruity and balance of all soft tissues. Additionally, one should consider addressing hindfoot or ankle pathology that may have contributed to recurrence following the initial procedure. The primary decision for most revisional procedures is whether or not the first MTP joint can be salvaged. In situations where the first MTP joint has undergone significant clinical and radiographic degeneration, or soft tissue contractures do not allow clinical realignment, first MTP joint arthrodesis may be the best option (2-6). Ideally, salvage procedures should be chosen based on the reason for failure following the primary procedure.

In summary, the keys to revisional hallux valgus surgery are to address the patient's primary symptoms, remain versatile when choosing procedures, develop a comprehensive approach, and be aggressive. The author prefers the following: 1) a modified Lapidus arthrodesis with unrecognized tarsometatarsal joint hypermobility or severe

deformity when the first MTP joint is salvageable; 2) First MTP joint arthrodesis with degenerative joint disease of the first MTP joint or with severe derangement secondary to soft tissue contracture; 3) If there has been no previous osteotomy or a moderate deformity, first metatarsal osteotomies are typically chosen, however, this situation is rather uncommon; 4) Lastly, the author is somewhat aggressive in terms of addressing hindfoot or ankle pathology that may have contributed to recurrence.

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