

## DIGITAL ADDUCTUS

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Hammertoe deformities are typically a sagittal plane deformity wherein the proximal phalanx is dorsiflexed at its respective MTP joint with variable flexion contracture at the digital PIPJ. These deformities may involve a single ray, multiple rays, or the entire forefoot.

Hammertoe correction most commonly involves either proximal phalangeal head resection or PIPJ fusion combined with release of the respective extensor tendons and /or MTP joint. This is generally adequate in most feet, but often inadequate in situations that also involve transverse plane deformities at the lesser MTP joints. As a result of less than ideal results with these more complex deformities, the author has chosen to reexamine the surgical alternatives.

Initially, the normal progression of surgical intervention with these deformities involved total joint release at the MPJ, usually combined with an intramedullary digital pin across the MTP joint maintaining it in a neutral position for the length of time that the pin remains in the toe, generally 4 to 6 weeks. In most hammertoe deformities with mild

adduction or abduction contracture at the MTP joint, that surgical plan may provide enough correction. In cases of more severe deformities particularly long-standing ones, additional procedures should be considered. Some authors have recommended medialization of the long flexor tendon, while others have performed a wedge osteotomy within the proximal phalangeal base.(Fig. 1)

Severe digital abduction is noted in patients with rheumatoid arthritis. This is often addressed with a resection arthroplasty at the MPJ, either the phalangeal base and/or metatarsal head followed by wire stabilization of the ray. This does provide adequate correction of very severe deformity but at the expense of the MTP joint. Most clinical situations are not as severe, and such drastic procedures are generally not considered. In the 1960s and 1970s, Kelikian was a proponent of phalangeal base resections of most hammertoe deformities, and this became a staple procedure of most orthopedic corrections. Kelikian recognized that the main component of a hammertoe was the MTP joint contracture and that the most direct way of reduction of this contracture was to perform a phalangeal base resection. He generally resected a significant portion of the proximal phalanx; "As a rule the proximal half or two-thirds is removed." This left a floppy toe and Kelikian popularized the combination of digital syndactyly and phalangeal base resection. Kelikian left us with the aphorism, two toes dangle less if they dangle together. (Fig. 2) The author had the opportunity to witness Kelikian perform this procedure many times and felt that the procedure was drastic. However, many years later, the author does recognize that this is a viable alternative in cases of long-standing joint subluxation and transverse plane deformity. Several cases will be reviewed that illustrate these points.

The most common digital deformity, the hammertoe is predominantly a sagittal plane deformity that has been treated quite effectively. In cases of forefoot or metatarsus adductus, the hammertoe deformity may be combined with medial subluxation and MTP joint contracture. —

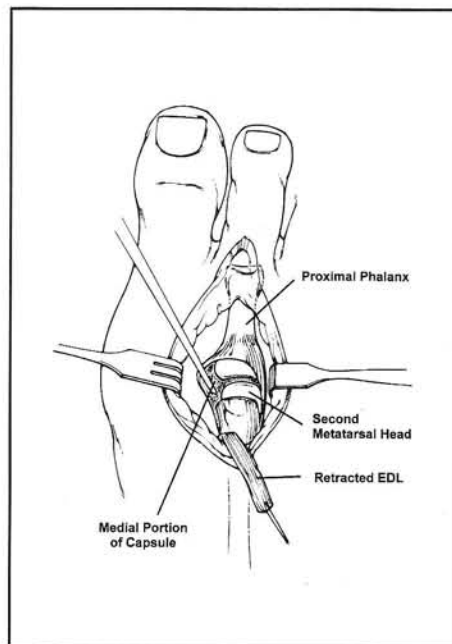


Figure 1. MPJ capsulotomy with release of the flexor tendon.

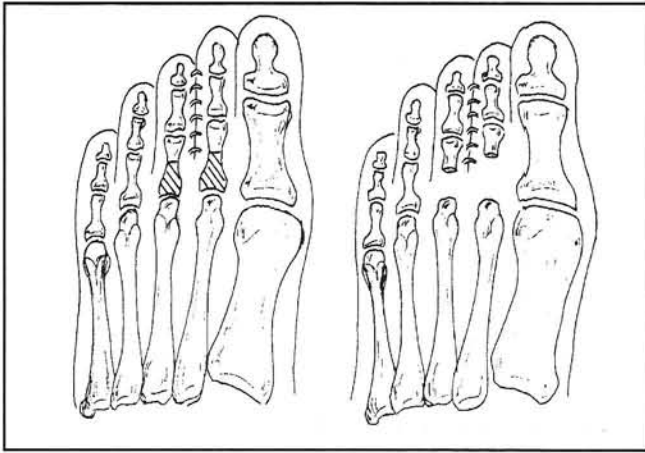


Figure 2. Kelikian's approach to MPJ deformity with base resection and digital syndactyly.



Figure 3. Preoperative AP view of long-standing hallux varus with associated digital adducture.



Figure 4. Divergent toes: Medial luxation of the second MPJ and lateral deviation of the 3rd MPJ.

The second clinical situation where digital adductus may be very prevalent is in cases of hallux varus. (Fig. 3) Generally, after several years, the lesser toes will follow the dominant great toe. As the hallux adductus increases so does that of the lesser toes. The second toe will be more adducted than the third which is more than the fourth. The MPJ adduction may be combined with extension contracture at the MTP joint.

The third situation involves what has been referred to as divergent toes. Typically two of the internal toes, 2 & 3 or 3 & 4, diverge in their transverse plane relationship with the other. (Fig. 4) At times, there may be an interdigital or space-occupying lesion that spreads the toes or more accurately their respective proximal phalanges yielding the described deformity. This has been associated with forefoot rheumatoid nodules, lipoma and neuroma soft tissue masses.

The author illustrates that proximal phalangeal base resection is a viable surgical alternative that should be considered in long standing or severe deformities of the lesser MPJs, particularly transverse plane deformities. Base resections should be performed with removal of as little bone as necessary for reduction of the MTP joint deformity. (Fig. 5)



Figure 5A. Preoperative view of global MPJ adduction deformity.



Figure 5B. Postoperative alignment following digital arthrodesis and limited base resection, 2nd and 3rd MTP joints.



Figure 5C. Postoperative result with rectus alignment of the lesser MPJs.