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Introduction

Hammertoe deformity often requires arthrodesis of the proximal interphalangeal (PIP) joint to achieve reliable, lasting correction. Metatarsophalangeal (MTP) joint instability often accompanies hammertoe deformity and requires correction. Pin fixation of both joints does not maintain adequate alignment or compression of the arthrodesis site. Many devices that provide better fixation preclude simultaneous pin fixation of the MTP joint. The HammerFIX device provides reliable fixation, compression of the arthrodesis site, and permits simultaneous pin fixation of the MTP joint if necessary.

Clinical Presentation

A 64-year-old female presented with a several year history of painful forefoot deformity. Shoe wear had become very difficult. She had not developed any skin breakdown. Physical examination demonstrated a flexible hallux valgus deformity, which could be passively corrected. Rigid 2nd and 3rd hammertoe deformity were present with some irritation of the skin dorsally at the PIP joint. The 2nd MTP joint was unstable, and she had pain with subluxation of the joint. The 3rd MTP joint was stable. She stated she could no longer live with her symptomatology and desired surgical correction.

Surgical Management and Outcome

A distal Chevron osteotomy bunionectomy, 2nd metatarsal shortening osteotomy, 2nd MTP joint ligament reconstruction, 2nd and 3rd toe PIP arthrodesis hammertoe correction were recommended and performed.

A HammerFiX implant was used to fixate the 2nd toe PIP joint. The Kirschner wire used for placement of the HammerFiX was retained and advanced across the 2nd MTP joint for fixation of the 2nd MTP ligament reconstruction. Fig. 1 shows her 1st post-operative visit X-ray taken 2 weeks after surgery. Fig. 2 shows a successful fusion has occurred in both toes at 8 weeks. The patient was completely satisfied with both the appearance of her toes, pain relief, and was able to resume unrestricted shoe wear without discomfort.



Fig. 1

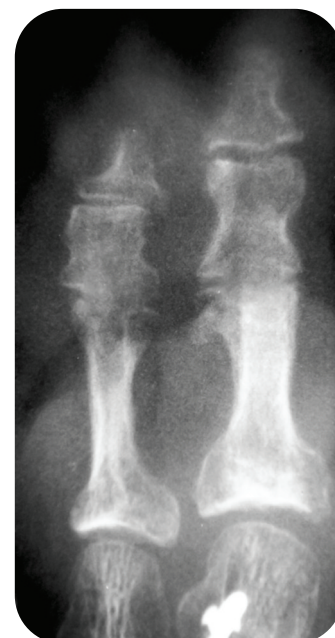


Fig. 2

Discussion

Hammertoe deformity is a common forefoot deformity that can be very difficult to manage without surgery. It is often irritation by the shoe that prompts patients to request surgical correction. Surgical treatment depends on whether or not the deformity is flexible. Flexible deformities can be corrected with tendon transfer. Rigid deformities, however, require a bony procedure. This can either be a resection of the head of the proximal phalanx, also known as a PIP resection arthroplasty, or realignment arthrodesis of the PIP joint.

In the past, it was believed that hammertoe deformity was caused by constricting shoes; it is now understood that most typically develop in patients in whom the 2nd metatarsal is the longest of the 5, or in patients who have 1st ray insufficiency such as with bunion deformity. It is believed that in either case, the 2nd MTP joint suffers from overuse during gait. This leads to microscopic tearing of the plantar plate of the MTP joint, and eventual tearing of the plantar plate. Insufficiency of the plantar plate results in instability of the 2nd MTP joint with dorsal subluxation and sometimes even dislocation. This instability results in an imbalance between the extrinsic and intrinsic motors of the 2nd toe and subsequent hammertoe deformity. With longstanding deformity, the next toe lateral will start to “follow” the deformed toe, and become a hammertoe as well, but often without MTP instability.

Therefore, it is often necessary to address the 2nd MTP joint instability at the same time as hammertoe correction in order to minimize the risk of recurrence. Internal fixation becomes necessary to maintain the corrected position of the MTP joint after correction of the instability. This is typically accomplished with a pin through all 3 phalanges of the toe and into the metatarsal head.

When the hammertoe is corrected by PIP resection arthroplasty, pin fixation of both the PIP joint and the MTP joint are adequate. However, the risks of PIP resection arthroplasty include recurrent deformity, development of a transverse plane angular deformity, or overcorrection deformity of the 2nd toe. Arthrodesis of the PIP joint reduces these risks; however, pin fixation is often inadequate fixation to accomplish arthrodesis of the PIP joint.

Many devices have been developed to enhance fixation of the PIP joint of the 2nd toe for arthrodesis. However, these preclude use of an intramedullary pin for simultaneous fixation of the MTP joint. The HammerFIX device addresses these problems in that it provides excellent fixation and compression of the arthrodesis site and is cannulated to permit simultaneous pin fixation of the MTP joint when necessary. The case presented above demonstrates the utility of this device as well as its effectiveness in achieving successful fusion and correction of the PIP joint.

In summary, the HammerFIX device provides excellent fixation for PIP arthrodesis in the correction of hammertoe deformity and has the added benefit of permitting simultaneous use of an intramedullary pin for fixation of the MTP joint when necessary. In cases where pin fixation of the MTP joint is not necessary, the HammerFIX device provides solid fixation and compression to achieve PIP arthrodesis for correction of hammertoe deformity.