Technique for 2nd Metatarsophalangeal Dislocation Correction

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STATEMENT OF PURPOSE

A long metatarsal and metatarsophalangeal joint (MTPJ) dislocation can be a challenge to the practitioner and frustrating to a patient. There are various surgical options, often modifications to the Weil osteotomy. This type of distal metatarsal osteotomy is more parallel to the weight bearing surface, dorsal-distal to plantar-proximal, and a significant complication is the floating toe with contractures from the incision. Our modification to this osteotomy along with a plantar plate repair has not been discussed for correction of a dislocated 2nd MTPJ. Our approach is perpendicular to the weight bearing surface to avoid the complication of a floating toe and allows for translation medially/laterally, plus a z-type incision avoids contracture.

LITERATURE REVIEW

Multiple surgical procedures have been attempted for 2nd metatarsal pain with/without dislocation and long metatarsal; most include a modification of the Weil osteotomy along with varied plantar plate repairs. There are also creative options such as distal metatarsal mini-invasive osteotomy (DMMO) attempted by Eng Meng Yeo et al, but they failed to address the floating toe. Flexor tendon transfers can leave the patient with stiffness and persistent plantar pain; metatarsal head resection with/without implant arthroplasty is a joint destructive procedure altering joint function leading to chronic pain. Kim et al had success with a DCWO at met head, and found it relieves pain and improves function, but also did not address the floating toe. It seems none of these surgical procedures can consistently provide patient with pain relief and a rectus digit that purchases the ground: metatarsal osteotomies intending to shorten or elevate the metatarsal head can leave the toe floating off the ground. We feel we have successfully addressed this complication.

Image 1: Incision placement

Image 2: 2nd MTPJ dislocation

Image 3: Z-lengthening

Image 2: Plantar plate tear

Technique

Attention directed to the Right 2nd ray where incision was made over the ray with proximal z-lengthening. The 2nd ray osteotomy was made perpendicular to the weight bearing surface from distal to proximal allowing either lateral or medial translation depending on the dislocation and to shorten the ray which was fixed with 2 small screws. Repair of the plantar capsule and plantar plate were done followed by repair of the collateral ligaments with non-absorbable sutures and then passed them through the drill holes in the proximal phalanx. Next the sutures were tensioned to give the toe its reduced attitude, and then held in place with the interference screws. The 2nd ray capsular structures were repaired. Closure with completed with a z-plasty at the most proximal portion of the incision to allow for length to avoid contractures of the skin.

Image 2: AP 2nd met osteotomy

Image 2: Oblique 2nd met osteotomy

METHOD

Twenty consecutive patients receiving a modified Weil osteotomy with plantar plate repair by one surgeon at one center to correct a long 2nd metatarsophalangeal with joint dislocation. Pre-op and post-op X-rays were evaluated over time for correction as well as clinical presentation at follow-up.

RESULTS

Overall, patient's were satisfied with their hammer-toe correction when contacted over the phone to discuss their experience. The mean age at surgery was 59 (range 32 to 75) years, with a mean follow-up period of 13.5 (range 12 to 18) months. The average shortening of the metatarsal was 3.2 mm, Floating toe was reported in 0% of cases, recurrence was reported in 0.5%. Transfer metatarsalgia was reported in 1%, whereas delayed union, non-union, and malunion were collectively reported in 0.5% of the cases.

DISCUSSION

Through an oblique osteotomy perpendicular to the weight bearing surface that is translated either medial or laterally depending on deviation of 2nd phalanx dislocation along with plantar plate repair you can achieve correction without risk of common complication of a floating toe.

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