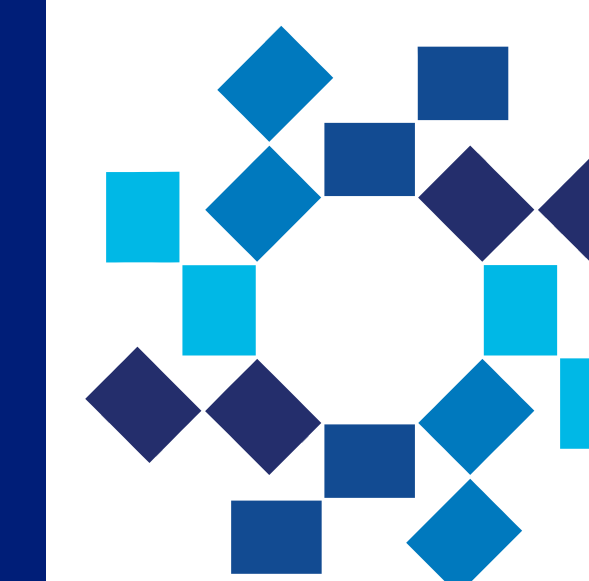


# Lesser Metatarsophalangeal Joint Pathology Addressed with Arthrodesis: A Case Series

Shane Hollawell DPM<sup>1</sup>, FACFAS, Brendan Kane DPM<sup>2</sup>, Juliana Paternina DPM<sup>2</sup>, Gregory Santamaria DPM<sup>2</sup>, Christopher Heisey DPM<sup>2</sup>  
<sup>1</sup>Doctor of Podiatric Medicine, Adjunct Professor, Department of Orthopedics, Rutgers University Medical School, Robert Wood Johnson, New Brunswick, NJ

<sup>2</sup>Resident - Department of Podiatry, Jersey Shore University Medical Center, Neptune NJ



Hackensack  
Meridian Health

## PURPOSE

1. Review the causes of lesser metatarsophalangeal (MTP) joint pathology.
2. Review the results, in a case series, of patients treated with arthrodesis of lesser MTP joints.

## CASE PRESENTATION

- We report on 4 patients with 5 severely dislocated lesser metatarsophalangeal (MTP) joints with varied comorbidities. The etiologies of the deformity placed these patients at a high risk for recurrence, and therefore fusion of the joint was performed to provide long term correction.
- 2 patients had collagen elasticity disorders making traditional surgical procedures (Tendon transfers, plantar plate repair, metatarsal shortening osteotomies) less likely to succeed. 1 patient had end-stage arthritis secondary to trauma and infection. And 1 patient had avascular necrosis (AVN) of the lesser metatarsal head.

## LESSER MTP JOINT PATHOLOGY

- Lesser MTP joint pathology is a difficult issue for the foot and ankle surgeon, especially in severely dislocated deformities.
- There are many structures that play a role in stabilizing these joints such as the plantar plate and collateral ligaments. When these structures are damaged, the toe will deviate and often cause pain.
- In many mild to moderate cases, this can be addressed with traditional surgical means. However when these methods fail, joint destructive procedures are usually required.
- A review of the literature reveals only 2 other studies (Karlock, 2003 and Hirose, 2014) that report on outcomes associated with lesser MTP joint fusion.

## OPERATIVE TECHNIQUE

- After placing each patient on the operative table in the supine position, the operative foot was prepared in the usual sterile fashion. An ankle tourniquet was used.
- A curvilinear incision was made overlying the involved lesser MTP joint.
- The joint was freed of plantar adhesions with the use of a McGlamry elevator and the joint was denuded of cartilage with an osteotome and rongeur. A K-wire was used for subchondral drilling.
- The joint was fused in 0 degrees in the transverse and frontal planes. The sagittal plane orientation was determined by the adjacent toes – usually in 5 to 15 degrees of dorsiflexion.
- A straight locking plate with a minimum of 2 screws were placed on either side of joint.
- Many adjunctive procedures took place as well: proximal interphalangeal joint arthrodesis/arthroplasties, 1<sup>st</sup> MTP joint arthrodesis, metatarsal shortening osteotomies, plantar plate repair, and tendon lengthening procedures



Figure 1: Pre and post-operative images of a 68-year-old female with severely dislocated 2<sup>nd</sup> MTP joint with hallux abducto-valgus deformity.



Figure 2: Pre and post operative AP x-rays of a 3<sup>rd</sup> MTP joint arthrodesis in a 74-year-old female with history of AVN of the 3<sup>rd</sup> metatarsal head.

## RESULTS

- 4 patients in this case series, 1 male and 3 females
- Average age of 62.3 years.
- Average BMI of 26.2
- The average follow-up time was an average of 17 months (range: 5-36 months)
- All patients proceeded to radiographic and clinical signs of fusion at an average time of 16.4 weeks
- 1 patient had a revisional surgery secondary to a non-union with broken, painful hardware.
- All patients had a subjective decrease in pain and improved functional status at the final follow-up.
- Meridian Health IRB approval was obtained for this study.

## SUMMARY

- We believe that this case review demonstrates that lesser MTP joint arthrodesis is a viable surgical option but should be reserved for severe or recalcitrant deformities.

### REFERENCES

1. Karlock LG: Second metatarsophalangeal joint fusion: a new technique for crossover hammer toe deformity. A preliminary report. J Foot Ankle Surg 42:177-182, 2003.
2. Hirose CB, Gamboa JT, Coughlin MJ: Concomitant first and second metatarsophalangeal arthrodesis for intractable second metatarsophalangeal joint pain. Foot Ankle Int; Aug; 35 (8): 825-828, 2014.