# Treatment of Metatarsalgia with Distal Osteotomies

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**KEYWORDS**

• Metatarsalgia • Distal osteotomies • Percutaneous osteotomies • Forefoot

**KEY POINTS**

- Many different distal metatarsal osteotomies have been described in the surgical treatment of metatarsalgia.
- The surgeon should use such osteotomies judiciously, and indeed, in this author's experience, they are infrequently required and are certainly not a first port of call.
- In cases where nonoperative treatments have failed, a thorough understanding of the causes of metatarsalgia and a detailed clinical assessment of the patient are essential if good surgical outcomes are to be achieved.
- If using distal metatarsal osteotomies as part of the surgical plan, then this author favors extra-articular percutaneous osteotomies to minimize postoperative stiffness.

## INTRODUCTION

Metatarsalgia is a symptom and not a diagnosis. It simply describes pain on the plantar aspect of the forefoot in the metatarsal head region (ie, the "ball of the foot"). The skill therefore lies in diagnosis of the cause or causes of this pain. Not until the cause or causes have been identified can the surgeon then consider appropriate treatment. It may sound obvious but the causes of metatarsalgia are numerous and can be interrelated. Not until a surgeon is skilled in the assessment of metatarsalgia can they hope to be successful in its treatment.

Although the term metatarsalgia itself does not distinguish between first and lesser metatarsal head region pain, the scope of this article is limited to the treatment of this symptom in the lesser rays.

As a rule, distal metatarsal osteotomies should be used sparingly in the treatment of metatarsalgia. The persistence of metatarsalgia despite nonoperative treatment does not automatically imply the need to use distal metatarsal osteotomies. In general, the surgeon should aim to correct the underlying cause of the metatarsalgia.

The author has nothing to disclose.
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For example, the patient presenting with metatarsalgia in the presence of hallux valgus rarely requires distal metatarsal osteotomies unless there is associated lesser metatarsophalangeal joint (MTPJ) subluxation/dislocation. Adequate triplanar correction of the hallux valgus deformity will restore the windlass mechanism and function of the first ray. Restoration of the Windlass mechanism will in turn will almost always sufficiently reduce lesser ray loading such that lesser metatarsal surgery is not required. This is not an absolute rule but one that generally holds true in this author's practice.

## CAUSES OF METATARSALGIA

- Biomechanical
  - Trauma
  - Iatrogenic
  - Congenital
- Biological
  - Metabolic
  - Infection
  - Neoplastic

## MEDIATORS OF METATARSALGIA

- *Lesser MTPJs* (synovitis, degenerative change, plantar plate abnormality)
- *Metatarsal heads* (stress response, fracture, avascular necrosis)
- *Sesamoids* (stress response, fracture, degenerative change, avascular necrosis)
- *Interdigital neuromas* (usually secondary to biomechanical abnormality)
- *Other plantar soft tissue* (skin corns/callosities/scars, bursitis, flexor tenosynovitis, plantar fibroma)

## BIOMECHANICAL CAUSES OF METATARSALGIA

- Secondary forefoot overload
  - Hindfoot and/or ankle deformity
  - Gastroc soleus contracture
- First ray abnormality
  - Hallux valgus
  - Hallux rigidus
  - Iatrogenic disturbance
- Metatarsal cascade abnormality
  - Sagittal plane deformity
  - Coronal plane deformity
  - Iatrogenic disturbance
- Lesser toe deformity
  - Usually itself secondary to proximal abnormality (see earlier discussion)

## CLINICAL EVALUATION

As has already been emphasized, a thorough history and detailed examination (standing and lying) including the knee, working distally to the toes and including footwear, are vital in evaluating the cause or causes of metatarsalgia. This has been emphasized and detailed by other investigators.[1–3] Radiographic examination with weight-bearing anteroposterior and lateral views of the foot is obligatory, and a skyline metatarsal view can also be helpful in assessing metatarsal sagittal inclination. Ultrasound, MRI, and computed tomography (CT) scan