Significant Shortening by Central Metatarsal Osteotomy Stabilized with Intramedullary Fixation: A 10-year Retrospective Review

One of the causes of central metatarsalgia is an abnormal metatarsal length parabola. In most circumstances, limited shortening is required with myriad osteotomies and fixation existing. However, when significant central metatarsal shortening is required, fewer options are available. We present a long-term follow-up of a novel approach that utilizes intramedullary fixation for the treatment of central metatarsal deformities that require significant shortening.

**PURPOSE**

A list of all surgical interventions performed by our section from January 2001 to August 2013 was evaluated for potential inclusion. Of the 8,456 cases performed during this period, 21 patients underwent shortening osteotomy ≥4-mm stabilized with an intramedullary Steinman pin (Figure 1). Minimum follow-up of six months was required. Patients were allowed immediate protected weightbearing. Radiologic pre and postoperative measurements included the “Maestro line” for evaluation of global metatarsal cascade and a standardized longitudinal central metatarsal length to determine the measured amount of metatarsal shortening (Figures 2 and 3).

**CASE STUDY**

**RESULTS**

Fourteen women and seven men (mean age: 54-years; metatarsals: 33) were included. Mean shortening was 7.7-mm (range: 4 to 16-mm) and an appropriate radiographic metatarsal cascade was restored in all patients. The mean follow-up was 60.6-months (range: 7 to 121-months). One medically co-morbid patient required external bone growth stimulation to achieve union. Six (29%) patients required continued orthotic management for limited residual forefoot symptomatology.

**ANALYSIS and DISCUSSION**

This procedure provides a sound alternative to other metatarsal osteotomies as it affords a predictable means for significant shortening of a central metatarsal, allows for reconfiguration of the central metatarsal cascade and is extra-articular thereby preserving joint integrity and metatarsal morphology.

References