

## 2013 The National APMA Abstract Competition Winners

**Category:** Outstanding Oral Abstract Presentation

**Third place:** Ms. Arianna Halbstein-Sabghir

**Title:** Brachymetatarsia: A Retrospective Case Series

**Co-authors:** John J. Doolan; Lauren Dabakaroff, BS, MS; Sharon Barlizo, DPM

**Introduction:** Brachymetatarsia is defined as an abnormal shortening of the metatarsals. The most commonly affected metatarsals are the 4<sup>th</sup> followed by the 3<sup>rd</sup> metatarsals. Brachymetatarsia has a predilection for females of 25:1, with a reported incidence of 0.02% to 0.05%. The most common treatment includes distraction osteogenesis with a monolateral external fixator. In this retrospective case series, we evaluated the surgical outcomes and patient satisfaction using this treatment method of 53 patients treated for brachymetatarsia with distraction osteogenesis and bone stimulation between 2000-2012. Common complications include infection, dislocation of the MPJ, stiffness at the MPJ, keloid formation, edema and non union.

**Methods used:** 53 patients (63 metatarsals) underwent distraction osteogenesis with a monolateral external fixator immediately followed by the use of a bone stimulator for the treatment of brachymetatarsia. The average age of patients at the time of surgery was 30.9 years, with 50 females (94.3%) and 3 males (5.6%). 85.7% (54 metatarsals) of the affected metatarsals were the 4<sup>th</sup> and 14.2% (9 metatarsals) were the 3<sup>rd</sup> metatarsal.

**Results found:** Of the 63 metatarsals treated with distraction osteogenesis with a monolateral external fixator, 93.6% of bones achieved adequate length. However, 4.8% or 3 metatarsals did not achieve the adequate length to fit the normal metatarsal parabola and 1.6%, or 1 metatarsal, was too long. Overall, 9.5% of patients, or 6 patients, underwent revisional procedures. 95.2% of patients were satisfied overall with the results of their brachymetatarsia treatment.

**Conclusion:** Distraction osteogenesis with bone stimulation proved successful as a cosmetic surgical procedure of choice for lesser metatarsal brachymetatarsia. 95.2% of cases resulted in an acceptable, cosmetically appealing, functional toe.

Learning objectives: "at the completion of the session or demonstration, participants should be able to..."

#1: Properly identify and diagnose a case of congenital brachymetatarsia.

#2: Feel confident in the treatment of brachymetatarsia using a monolateral external fixator, Ilizarov principles in conjunction with bone stimulation.

#3: Understanding the common complications associated with surgical correction of brachymetatarsia and the importance of informing patients of these complications to ensure patient satisfaction.

## References:

1. Stedman TL: Stedman's Medical Dictionary, 28<sup>th</sup> Ed, p 249, Williams & Wilkins, Baltimore, 2006.
2. Schimizzi A, Brage M. Brachymetatarsia. Foot Ankle Clin. 2004 Sep;9(3):555-70, ix.
3. Goforth WP, Overbeek TD. Brachymetatarsia of the third and fourth metatarsals. J Am Podiatr Med Assoc. 2001 Jul-Aug;91(7):373-8.
4. Munuera Martínez PV, Lafuente Sotillos G, Domínguez Maldonado G, Salcini Macías JL, Martínez Camuña L. Morphofunctional study of brachymetatarsia of the fourth metatarsal. J Am Podiatr Med Assoc. 2004 Jul-Aug;94(4):347-52.
5. Shim JS, Park SJ. Treatment of brachymetatarsia by distraction osteogenesis. J Pediatr Orthop. 2006 Mar-Apr;26(2):250-4.
6. Lamm BM, Gourdine-Shaw MC. Problems, obstacles, and complications of metatarsal lengthening for the treatment of brachymetatarsia. Clin Podiatr Med Surg. 2010 Oct;27(4):561-82. doi: 10.1016/j.cpm.2010.06.006. Epub 2010 Jul 22.
7. Davidson RS. Metatarsal lengthening. Foot Ankle Clin. 2001 Sep;6(3):499-518.