Early weightbearing with utilization of locking plate technology for fifth metatarsal osteotomies: A case report

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Statement of Purpose
We present a novel technique in fixing proximal fifth metatarsal osteotomies for a tailor’s bunionette utilizing multiple-hole locking plate system. The construct provides excellent stability, minimal personnel dissection, and allows for early weight-bearing without complications.

Introduction
A tailor’s bunionette is defined as an osseous and soft-tissue prominence at the lateral aspect of the fifth metatarsal head (1). This condition is characterized by splaying of the fifth metatarsal, which is exacerbated by muscle imbalance and localized hyperpronation. Operative options for this deformity include, but are not limited to, osteotomies, arthroplasty techniques, and metatarsal osteotomies at various levels (2).

Mann and Coughlin recommended osteotomies over the use of exostectomies, arthroplasty, and proximal oblique corticotomy, which they reported to be more reliable than the former (3, 4). The authors advocated for the use of osteotomies at the metaphyseal portion of the fifth metatarsal, which they believed to be the most stable area for the osteotomy to be performed (4, 5). They also believed that osteotomy at this level would allow for a greater amount of deformity correction but is traditionally associated with a longer healing period (5).

The treatment goals of tailor’s bunion surgery are to correct the underlying deformity, relieve pain, prevent recurrence, and improve function with early weight-bearing (3). Coughlin in 1991 described an oblique diaphyseal osteotomy of the fifth metatarsal in his series of patients with a rate of 93% (6). He and colleagues reported 93% good to excellent results in that series (6). London et al. similarly reported successful outcomes of 94% in a series of 16 patients, with a correction of 17.5 degrees at the fourth-fifth metatarsal angle and a reduction of the varus deformity of 22 degrees (7). Lehtinen et al. in 2003 reported good to excellent results of 91.7% in a series of 26 patients treated with the distal oblique osteotomy and soft tissue excision, and with an average follow-up of 3 years (8).

The patient outcomes were rated as good to excellent as patients were able to bear weight early and demonstrate radiographic evidence of osseous consolidation, stable fixation, and excellent alignment with demonstrated deformity correction.

Case Presentation
A 50-year-old Caucasian female presented to the office of the principal author with chief complaint of a painful tailor’s bunion deformity to her left foot. The past medical and surgical history was unremarkable and she presented with no other musculoskeletal complaints. The deformity resulted in difficulty standing, walking, and performing daily functional activities. Pain was also exacerbated by shoe-gear irritation.

On clinical examination, she demonstrated a pronated foot-type when weight-bearing, clinical lateral deviation of the 5th metatarsal bone, and pain on palpation to the lateral aspect of the 5th metatarsal head.

Technique
A 4-cm dorsolateral incision is made over the area of the fifth metatarsal, without violating the MTP joint. The soft-tissue envelope is then dissected off the bone medially and laterally. An oblique osteotomy is then made at the proximal metaphyseal portion of the fifth metatarsal bone. Temporary fixation is achieved using 0.062 K-wires. An eight-hole locking plate is applied at the lateral aspect of the metaphyseal osteotomy. The fixation is secured with locking variable-angle screws and an oblique cortical screw through the osteotomy site.

Results
Patient was immediately weight-bearing as tolerated in a CAM-boot for approximately four weeks prior to transitioning into regular shoes. Serial postoperative radiographs confirmed osseous consolidation, stable fixation, and excellent alignment with demonstrated deformity correction.

Listing Plates
The locking plate technology does not depend upon forces of friction existing between the opposing surfaces of the internal and external components. The locking mechanism is designed to achieve a perfect compression and stability.

Discussion
The treatment goals of tailor’s bunion surgery are to correct the underlying deformity, relieve pain, prevent recurrence, and improve function with early weight-bearing (5). Coughlin in 1991 described an oblique diaphyseal osteotomy of the fifth metatarsal in his series of patients with a rate of 93% (6). He and colleagues reported 93% good to excellent results in that series (6). London et al. similarly reported successful outcomes of 94% in a series of 16 patients, with a correction of 17.5 degrees at the fourth-fifth metatarsal angle and a reduction of the varus deformity of 22 degrees (7). Lehtinen et al. in 2003 reported good to excellent results of 91.7% in a series of 26 patients treated with the distal oblique osteotomy and soft tissue excision, and with an average follow-up of 3 years (8).

The patient outcomes were rated as good to excellent as patients were able to bear weight early and demonstrate radiographic evidence of osseous consolidation, stable fixation, and excellent alignment with demonstrated deformity correction. The locking plate construct presented allows for early weight-bearing secondary to stable fixation at the osteotomy site with confirmed radiographic evidence of osseous consolidation. The approach allows for multiple points of fixation and elimination of the screws, which advances stability and minimizes risk of dorsal displacement with contraction of the soft tissue. Furthermore, the low-profile nature of the construct minimizes risk for irritation.

References
6. Coughlin MJ. Treatment of bunionette deformity with longitudinal diaphyseal osteotomy with distal soft tissue dissection, and allows for early weight-bearing without complications.