

Treatment of bunionette deformity with distal oblique sliding osteotomy

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Abstract

Background: Taylor's bunion is a bone prominence on the lateral side of the fifth metatarsal head, it is most often associated with soft tissue bursitis and a tender callosity.

In the current series, we evaluated a technique of Distal Oblique Sliding Osteotomy using K-wire fixation.

Materials and methods: We present a retrospective and consecutive series concerning six patients (six feet) suffering from symptomatic bunionette deformity treated through the DOSO with k-wire fixation. We describe this procedure, their results, and short-term follow-up.

Results: At 12 months follow-up, the results were satisfactory in 5 feet, fair in one patient following the American Orthopaedic Foot and Ankle Society (AOFAS) score. The average preoperative intermetatarsal 4-5 angle improved from 14,5° (range, 8°-17°) to 5° (range, 5°-9°) and the fifth metatarsophalangeal angle improved from 16.2° (range, 10°-24°) to 3,5° (range, 2°-9°).

Conclusion: This technique is versatile, cost-effective (can use a small piece of pins), safe and reliable in comparison to other types of bunionette osteotomy and their osteosynthesis.

Keywords: Bunionette; Deformity; Osteotomy; Fifth metatarsal; Foot.

1. Introduction

Taylor's bunion or bunionette is a lateral forefoot condition consisting of a painful prominence over the distal fifth metatarsophalangeal joint. It is more frequent in female than male, 3 to 6 times greater [1]. Multiples causes of bunionette have been described, they are either structural or mechanical. The principal cause is a chronic irritation of the lateral forefoot due to pressure, followed by increased intermetatarsal 4-5 angle, either congenitally or acquired [2,3].

Coughlin distinguished 3 types of bunionette according to M5 aspect: type 1, with increased M5 head volume and prominent lateral condyle; type 2, bow deformity inducing symptomatic prominence of the lateral condyle; and type 3, with increased M4M5 angle (normal angle, < 12 °) with no particular distal M5 deformity [4].

This deformation may be associated with hallux valgus and splayfoot [5].

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2. Materials and Methods

We conducted a retrospective case series involving 6 patients diagnosed as symptomatic bunionette (figure1) and treated with distal oblique sliding osteotomy between December 2016 and December 2018.

All patients were female and the mean age at the time of surgery was 35 years.

Radiographs were obtained for all the feet standing in two incidences; anteroposterior and lateral pre- and post-operatively. We have measured the fourth-fifth intermetatarsal angle and the fifth metatarsophalangeal angle preoperatively and postoperatively (figure 2) and evaluated the clinical results using the American Orthopaedic Foot and Ankle Society (AOFAS) scale.

The operative procedure was performed through a lateral approach under regional anesthesia using a tourniquet, after capsular opening, dorsolateral or lateral prominence on the fifth metatarsal head is resected with a power saw, the osteotomy was made on the distal part of the fifth metatarsal from distal-lateral just proximal to the articular cartilage to proximal-medial. Then we have translated the distal fragment medially and fixate the osteotomy with a Kirschner wire, overhanging edges or bony prominences are then rasped smooth (figure 3).

The direction of the osteotomy and k-wire fixation was evaluated in sight, fluoroscopy was used just at the end of the surgery to verify the position of the k-wires. (figure 4) A bandaging was applied at the fifth toe in an abducted position, postoperatively the patients were advised to partial weight bearing on the heel in a surgical shoe with crutches for 5 weeks. Then patients were returned gradually into their regular shoe gear as tolerated.

k-wire was removed postoperatively after bone healing.



Figure 1 Clinical photograph showing bilateral bunionette deformity associated with hallux valgus



Figure 2 Preoperative X-ray showing intermetatarsal 4-5 angle (red angle), fifth metatarsophalangeal angle (blue angle) and intermetatarsal 1-5 angle (yellow angle)



Figure 3 Operative view showing the distal oblique sliding osteotomy and k-wire fixation



Figure 4 Postoperative X-ray

3. Results

Assessment was regular at 1, 3, 6 and 12 months, based on clinical and radiological examination. The mean follow-up was 12 months with an average time between 6 and 20 months. The American Orthopedic Foot and Ankle Society Scale (AOFAS) was used, it showed a real improvement after surgery, the mean total score of all patients was 95, five patients were rated as excellent and one as good, all of the six feet were without pain postoperatively, no patient required comfortable shoes and could tolerate conventional shoes, one patient had a delayed union until the 4 month.

Painful callosity around the fifth metatarsophalangeal joint disappeared after surgery in all cases, with significant painless footwear even with heeled shoes.

The average preoperative intermetatarsal 4-5 angle improved from $14,5^{\circ}$ (range, 8° - 17°) to 5° (range, 5° - 9°) and the fifth metatarsophalangeal angle improved from $16,2^{\circ}$ (range, 10° - 24°) to $3,5^{\circ}$ (range, 2° - 9°). Furthermore, bunionette was bilateral in four patients, and combined with symptomatic hallux valgus in two patients.

The duration of the bone healing occurred generally at two months, and average time of complete consolidation was between one and four months. Therefore, patients were encouraged to have a second surgery on the other side.

4. Discussion

The present study demonstrated excellent clinical and functional results with distal Oblique sliding osteotomy, this technique was first described in 1971, by Smith and Weil [6], their osteotomy was performed through a 1-cm incision overlying the metaphyseal area of the metatarsal head. The osteotome was positioned obliquely forming an angle of 70° from distal-lateral to proximal-medial, in order to have the bone slide medially with little chance of lateral subluxation.

Multiples types of metatarsal osteotomy have been described. Proximal osteotomy provides good correction but lead to non-union because of insufficient vascularization of the fifth metatarsal. Shereff in his studies demonstrated that bone

vascularization is maximal at the proximal and medial level of the metatarsal, their interruption may result in a delay in consolidation or in nonunion. This is the well-known problem encountered in Jones' fractures [7,8]. Diaphyseal osteotomy respects metatarsal vascularization, but is associated with delayed union but not induce transfer metatarsalgia [9]. Also, more vertical osteotomies are less stable and don't allow achieving pins or screw perpendicular to the plane of osteotomy [10]. Although, distal oblique osteotomies are more stable with less displacement and consolidate rapidly, we can enhance stabilization through a single K-wire to limits the risk of dorsal displacement of the fifth metatarsal head and therefore avoid transfer metatarsalgia postoperatively. However, in cases of oblique metatarsal osteotomy without fixation this complication occurred in 36% of cases. This procedure allows a large amount of correction possible we can translate more than 50% of neck width and ameliorate the intermetatarsal 4-5 angle [11, 12].

Despite our short series, we are very satisfied with our results using this oblique sliding osteotomy for bunionette deformity correction. In addition, fixation through pins improve stability and possibility of bone healing.

5. Conclusion

Distal oblique sliding osteotomy of the fifth metatarsal appears to be a safe surgical procedure for treatment of symptomatic bunionette. All types of bunionette deformity can be treated in this way and stabilization by osteosynthesis help to have early mobilization.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Statement of informed consent

Patient gives informed consent for publication.

References

- [1] Roukis TS. The tailor's bunionette deformity: a field guide to surgical correction. *Clin Podiatr Med Surg* 2005; 22:223–45.
- [2] Nestor BJ, Kitaoka HB, Ilstrup DM, et al. Radiologic anatomy of the painful bunionette. *Foot Ankle* 1990; 11:6–11.
- [3] DuVries, H.L.: Acquired nontraumatic deformities of the foot. In DuVries' *Surgery of the Foot*. 3rd Ed. Inman, V.T. (ed.), St. Louis, C.V. Mosby Company, 1973; 236
- [4] Coughlin, M. L. Treatment of bunionette deformity with longitudinal diaphyseal osteotomy with soft tissue repair. *Foot Ankle* 1991; 11:195–203,.
- [5] Bishop, J., Kahn, A. III, and Turba, J.E.: Surgical correction of the splayfoot: the Giannestras procedure. *Clin. Orthop.* 1980; 146:234-238,.
- [6] Smith SD, Weil LS. Fifth metatarsal osteotomy for tailor's bunion deformity: minor surgery of the foot. Leander (TX): Futura Publishing; 1971.
- [7] Diebold P. Bunionette deformity: osteotomies of the fifth metatarsal bone. In: Wulker N, editor. *An atlas of foot and ankle surgery*. London: Martin Dunitz Ltd; 1998; 93–8.
- [8] Shereff, M.J.: Circulation of the fifth metatarsal and rationale for treatment. Presented at the third annual meeting of the American Orthopaedic Foot and Ankle Society, Santa Fe, New Mexico July 17-19, 1987
- [9] Coughlin MJ. Bunionette repair with midshaft oblique osteotomy and distal soft tissue repair. *Tech Foot Ankle* 2010; 9:14–9.

- [10] Boyer ML, Deorio JK. Bunionette deformity correction with distal chevron osteotomy and single absorbable pin fixation. *Foot Ankle Int* 2003; 24:834–7.
- [11] Grebing BR. Distal fifth metatarsal chevron osteotomy for bunionette correction. *Tech Foot Ankle* 2010; 9:5–8.
12. Catanzariti, A. R., Friedman, C., Distazio, J. Oblique osteotomy of the fifth metatarsal: a five year review. *J. Foot Surg.* 1988; 27:316 –320.