

CASE STUDY



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Treatment of hallux abducto valgus deformity with LapiPrep and APTUS 2.8 TriLock biplanar fixation

The Surgeon

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Introduction

Hallux abducto valgus is a common deformity that is treated by foot and ankle surgeons. There have been over 200 surgical procedures described in the literature for correction of the deformity.¹⁻³ However, the modified Lapidus bunionectomy, or a first tarsometatarsal joint arthrodesis, is a very powerful procedure that can correct the misalignment of the first ray in all three planes.⁴⁻⁶ The procedure, which addresses and corrects the center of rotation of angulation (CORA) of the first metatarsocuneiform joint, has low recurrence rates⁵ and low non-union rates³ while allowing early weight-bearing.⁴⁻⁶ The LapiPrep system was employed to enable joint preparation and correction of the bunion deformity in all three planes, including frontal, transverse and sagittal planes.

The Case



Patient Profile

The patient was a 59-year-old female who had a painful left hallux abducto valgus deformity. She had a past medical history of tobacco use, anxiety and depression. She experienced pain on a daily basis despite wearing wider shoes, taking anti-inflammatory medication and icing her foot. She was looking for a more long term solution to her pain and was interested in triplanar correction of her bunion.



Pre-operative Imaging and Diagnosis



Figure 1: Pre-op lateral view

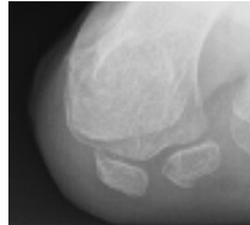


Figure 2: sesamoid, axial view



Figure 3: Pre-op AP view



Surgical Treatment

A linear longitudinal incision was made just medial to the extensor hallucis longus tendon over the first tarsometatarsal joint. The joint was then exposed and an osteotome was utilized to free up the joint space. The LapiPrep jig was employed to facilitate reduction of the hallux abducto valgus in all three planes, including dorsiflexion of the first metatarsal, while providing required compression to facilitate placement of hardware. The onboard compression screw was utilized to decrease the the IM angle from approximately 14 to 4 degrees valgus. The pronation rail was utilized to decrease the HAV from 31 to 13. Once all corrections were verified under fluoroscopy, a resection of 1.5mm was taken from the first metatarsal and 3mm from the cuneiform, and two Medartis APTUS 2.8 Generic Straight Plates were placed, one dorsal and one medial to the first tarsometatarsal joint. After bilateral fixation of the first tarsometatarsal joint, residual instability was confirmed and addressed with the placement of a 3.5mm bio-integrative screw from the first cuneiform to the second cuneiform. (Figures 4a and 4b)



Figure 4a: Intra-op Final AP



Figure 4b: Intra-op Final Lateral



Post-Operative Treatment

The patient was non-weight bearing in a cam boot for the first two weeks. At two weeks post-op, she was allowed to fully weight bear in the cam boot. At six weeks post-op radiographs did show acceptable progression of healing and she was progressed to weight bearing in her shoe. She was able to return to full activity at three months post-op which included walking for exercise. (Figure 5a and 5b)



Figure 5a: 12 weeks post-op



Figure 5b: 12 weeks post-op



Conclusion

First tarsometatarsal joint arthrodesis is a well-established procedure for the treatment and correction of hallux abducto valgus.¹⁻³ The modified Lapidus procedure with triplanar correction has distinct advantages including low recurrence rates, low nonunion rates and early weight bearing.³⁻⁶ LapiPrep is an innovative system that allows for correction in all three planes with one jig. The LapiPrep System also allows for distraction designed for joint preparation and subsequent joint compression for placement of the hardware. Furthermore, surgeons can utilize their preferred method of fixation, allowing them to meet the unique requirements of the case.

Pre and Post-Op Comparative Images



12 weeks Post-Op

References

1. Li S, Myerson MS. Evolution of thinking of the Lapidus procedure and fixation. *Foot and Ankle Clinics*. 2020;25(1):109-26.
2. Langan TM, Greschner JM, Brandão RA, Goss Jr DA, Smith CN, Hyer CF. Maintenance of correction of the modified Lapidus procedure with a first metatarsal to intermediate cuneiform cross-screw technique. *Foot & Ankle International*. 2020;41(4):428-36.
3. Do DH, Sun JJ, Wukich DK. Modified Lapidus Procedure and Hallux Valgus: A Systematic Review and Update on Triplanar Correction. *Orthopedic Clinics*. 2022 Sep 14.
4. Dayton P, Carvalho S, Egdorf R, Dayton M. Comparison of Radiographic Measurements before and after triplane tarsometatarsal arthrodesis for hallux valgus. *JFAS* 2020, 59(2): 291-297.
5. Ray JJ, Koay J, Dayton PD, Hatch DJ, Smith B, Santrock RD. Multicenter Early radiographic outcomes of triplanar tarsometatarsal arthrodesis with early weight-bearing. *Foot Ankle Int*. 2019 Aug;40(8).
6. Manchanda K et al. Short term radiographic and patient outcomes of a biplanar plating system for triplanar hallux valgus correction. *JFAS* 2020 Aug 15;S1067-2516(20)30285-4.