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## Technique 11: Moberg Osteotomy

Rocio del Pilar Pasache Lozano<sup>a</sup> Jason Ying Choi Chow<sup>b</sup> Faisal Alsayel<sup>c</sup>  
Victor Valderrabano<sup>d</sup>

<sup>a</sup>Hospital Angeles Querétaro, Santiago de Querétaro, Mexico; <sup>b</sup>Greater Sydney Foot and Ankle Research Education Organisation, Nepean Hospital, Kingswood, NSW, Australia; <sup>c</sup>Department of Orthopedic Surgery, King Fahad Specialist Hospital, Dammam, Saudi Arabia; <sup>d</sup>Swiss Ortho Center, Swiss Medical Network, Schmerzklinik Basel, Basel, Switzerland

### Abstract

The Moberg osteotomy is a surgical technique used to treat hallux rigidus. It is a dorsiflexion osteotomy of the proximal phalanx of the great toe primarily indicated for active young patients with dorsal metatarsal phalangeal joint osteoarthritis. It was initially performed on adolescent patients, however, Moberg expanded the indications making it applicable to the adult population. The goal of the technique is to alleviate pain and allow for greater dorsiflexion at metatarsal phalangeal joint while sacrificing plantarflexion. Furthermore, in combination with a cheilectomy allows active patients to continue participating in sports and maintain the ability to wear shoes with variable heel heights.

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- Active patients.
- Moderate to severe hallux rigidus.

### Contraindications

- Normal dorsiflexion.
- Restricted plantarflexion.
- Elderly patients.
- Non-active patients.
- End-stage arthritis.

### Technique

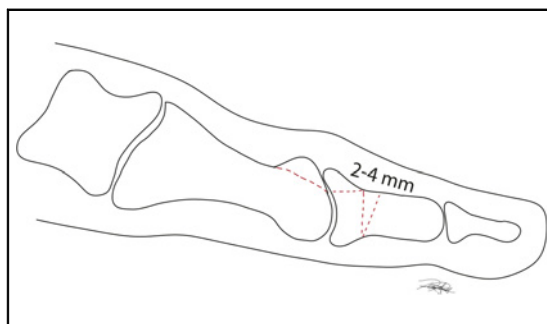
- General or regional anesthesia.
- Supine.
- Tourniquet on the upper leg.
- Longitudinal dorsomedial incision, medial to extensor hallucis longus (EHL) (Fig. 1).
- Dorsomedial nerve is identified and protected.
- First, cheilectomy is performed by excising the osteophyte flush with the surface of the metatarsal neck. No more than 30% of the

### Indications

- Limited dorsiflexion.
- Normal plantarflexion.
- Young patients.



**Fig. 1.** Clinical picture showing longitudinal dorsomedial incision.



**Fig. 2.** Diagram of cheilectomy and Moberg osteotomy.

metatarsal head should be excised to maintain stability of the joint (Fig. 2).

- Moberg osteotomy is then performed by elevating the periosteum of the proximal phalanx and placing a 1.6 mm K-wire parallel to the MTPJ to guide the osteotomy.
- Cuts are performed maintaining the plantar cortex as a hinge.
- The first cut is made parallel and close to the MTPJ and the second cut is made 2 to 4 mm distally and oblique to the first cut in the sagittal plane (Fig. 2).
- A dorsal wedge of bone should be removed maintaining the plantar cortex hinge.
- After manual dorsiflexion of the phalanx on the plantar hinge, fixation can be made with different implants (staples, sutures, or 1.6 mm K-wires).
- Our preference is to use 2.2 mm cannulated screw (2.2 Cannulated Compressing Screws, Medartis) from proximal to distal.
- Entry point of the wire is proximal and plantar, aiming medial and dorsal to maximize purchase of the screw.
- Fluoroscopy should be used to confirm position and alignment.
- Capsulorrhaphy is performed with 1.0 absorbable suture, 4.0 absorbable suture for subcutaneous tissue and 4.0 nylon suture for skin.

## Risks and Complications [1, 2]

- Soft tissue injury to flexor hallucis longus (FHL), extensor hallucis longus (EHL) or the dorsomedial nerve.
- Fracture of the plantar cortex.
- Intraarticular extension of the osteotomy.
- Infection.
- Nonunion, malunion or loss of fixation.
- Symptomatic hardware.
- Persistent or recurrent pain requiring an arthrodesis.

## Aftercare

- Light dressing.
- Weightbear as tolerated from the first postoperative day with a stiff sole shoe.
- Sutures are removed after 14 days.

## Results

Historically, Citron and Neil [3] studied 10 female patients with 22 years follow-up, 50% had permanent relief and 50% had short-term relief after the osteotomy; one required arthrodesis secondary to degenerative changes and, Southgate and Urry [4] in their long-term retrospective series compared

8 dorsal wedge osteotomies with 16 first metatarsophalangeal arthrodesis, 2 patients had post-operative pain in the Moberg group and 4 patients in the arthrodesis group. Therefore, their recommendation is if Moberg Osteotomy fails to relieve symptoms, an arthrodesis can be performed as a salvage procedure.

In addition, O'Malley and coworkers [5] retrospectively examined 81 patients and reported 85% satisfaction after cheilectomy with Moberg osteotomy with a significant difference in the mean passive dorsiflexion of 27°. Also, Perez-Aznar and colleagues [6] in a 42-patient prospective case series found 81% of excellent results with an AOFAS score of MTPJ dorsiflexion improvement from 20.3° to 55.7°, at last follow-up. Finally, in newer studies as presented by Maes et al. [7] in a 105-feet case series obtained statistically significant clinical and radiographical improvement with an increased mean range of motion of  $16.1 \pm 18.8$  in a combined Akin-Moberg osteotomy.

## Statement of Ethics

Written informed consent was obtained from patients for publication of the de-identified images.

## Conflict of Interest Statement

The authors have no conflicts of interest to declare.

## Funding Sources

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## Author Contributions

RPPL researched literature, made the development of first draft manuscript and final edition, JYCC and FA reviewed the manuscript, VV conceived and approved the final version of the manuscript.

## References

- 1 Warganich T, Harris T. Moberg osteotomy for hallux rigidus. *Foot Ankle Clin.* 2015;20(3):433–50. <https://doi.org/10.1016/j.fcl.2015.04.006>.
- 2 Seibert NR, Kadakia AR. Surgical management of hallux rigidus: cheilectomy and osteotomy (phalanx and metatarsal). *Foot Ankle Clin.* 2009;14(1):9–22. <https://doi.org/10.1016/j.fcl.2008.11.002>.
- 3 Citron N, Neil M. Dorsal wedge osteotomy of the proximal phalanx for hallux rigidus. Long-term results. *J Bone Jt Surg Br.* 1987; 69(5):835–7. <https://doi.org/10.1302/0301-620X.69B5.3680354>.
- 4 Southgate JJ, Urry SR. Hallux rigidus: the long-term results of dorsal wedge osteotomy and arthrodesis in adults. *J Foot Ankle Surg.* 1997;36(2):136–61. [https://doi.org/10.1016/s1067-2516\(97\)80060-9](https://doi.org/10.1016/s1067-2516(97)80060-9).
- 5 O'Malley MJ, Basran HS, Gu Y, Sayres S, Deland JT. Treatment of advanced stages of hallux rigidus with cheilectomy and phalangeal osteotomy. *J Bone Jt Surg Am.* 2013;95(7):606–10. <https://doi.org/10.2106/JBJS.K.00904>.
- 6 Perez-Aznar A, Lizaur-Utrilla A, Lopez-Prats F, Gil-Guillen V. Dorsal wedge phalangeal osteotomy for grade II-III hallux rigidus in active adult patients. *Foot Ankle Int.* 2015;36(2):188–96. <https://doi.org/10.1177/1071100714552481>.
- 7 Maes DJA, De Vil J, Kalmar AF, Lootens T. Clinical and radiological outcomes of hallux rigidus treated with cheilectomy and a Moberg-Akin osteotomy. *Foot Ankle Int.* 2020;41(3):294–302. <https://doi.org/10.1177/1071100719897264>.

Rocio del Pilar Pasache-Lozano  
Hospital Angeles Querétaro. Bernardino del Razo 21  
Room 335. Col. Ensueño, 76178  
Santiago de Querétaro  
Querétaro, México  
rocio\_pasache@hotmail.com