

SUBSPECIALTY PROCEDURES

SUTURE ANCHOR-ENHANCED MEDIAL CAPSULORRHAPHY OF THE GREAT TOE

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Investigation performed at the University of Alabama at Birmingham, Birmingham, Alabama

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Abstract

Background: The suture anchor-enhanced medial capsulorrhaphy of the great toe is utilized as an adjuvant procedure to proximal and distal osteotomies for the treatment of hallux valgus. In traditional open techniques, hallux valgus repair requires both osseous correction along with shortening of the capsule on the medial side of the metatarsophalangeal joint. Osseous correction typically corrects the intermetatarsal angle, whereas capsular correction maintains the hallux valgus angle¹.

Description: A standard medial approach to the 1st metatarsophalangeal joint is performed. A medial midline horizontal capsulotomy is performed starting just proximal to the medial eminence and extending distally to the base of the proximal phalanx. Once the concomitant osseous and soft-tissue procedures are completed, a vertical capsulotomy is made in the inferior capsular flap at the level of the metatarsophalangeal joint in a manner perpendicular to the first ray in order to form an L shape. A 3 to 4-mm wedge of capsule is formed near the base of the vertical limb, running obliquely to the horizontal limb, and is excised. Optionally, the free limbs of the inferior capsule are imbricated. A unicortical hole is then drilled in the first metatarsal head, and a 2.7-mm outer diameter by 7-mm deep suture anchor with 2-0 FiberWire (Arthrex) is placed. The free ends of the suture are then utilized to close the horizontal capsulotomy in a running-locking interrupted fashion. Fluoroscopic imaging is performed throughout the procedure to prevent overcorrection and varus malignment.

Alternatives: Alternative treatments include L-shaped capsulorrhaphy without suture anchor augmentation, dorsolateral capsulorrhaphy, Y-shaped capsulorrhaphy, and proximal hallux osteotomy or distal hallux osteotomy without capsulorrhaphy.

Rationale: Anchor-enhanced capsulorrhaphy has been proven to assist in early maintenance of hallux valgus angle correction when combined with relevant distal osteotomy techniques. The anchor-enhanced capsulorrhaphy has an advantage over traditional capsulorrhaphy methods because it allows enhanced tightening of the capsule to the bone and, therefore, the potential for enhanced short-term maintenance. Additionally, the use of a running-locking interrupted suture technique reduces the number of suture knots required for capsular closure, potentially reducing the chance of complications such as suture granuloma

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formation. This technique is useful in all patients with hallux valgus deformity because it helps to provide durable deformity correction through additional modification of the soft tissues surrounding the 1st metatarsophalangeal joint.

Expected Outcomes: Medial capsulorrhaphy has been shown to help with short-term reduction of the hallux valgus angle, both with and without the use of suture anchors¹⁻³. Gould et al. demonstrated the superiority of adding suture anchors to the L-shaped medial capsulorrhaphy in order to aid in prevention of early postoperative relapse of the valgus deformity in patients undergoing chevron or modified McBride osteotomy¹. We have utilized this suture anchor-enhanced capsulorrhaphy technique as an adjuvant procedure in most patients receiving osteotomies or Lapidus procedures for hallux valgus correction with consistent, reproducible results. In our experience, the suture anchor-enhanced medial capsulorrhaphy is an effective and time-efficient adjunctive soft-tissue corrective procedure in hallux valgus patients.

Important Tips:

- Always excise a small capsular wedge to start with.
- Throughout the capsular tightening process, utilize clinical judgment and fluoroscopy to avoid pulling the hallux into varus malalignment.
- If varus is noted during plication of the plantar capsule, simply undo the tightening stitch.
- Because the majority of capsular tightening occurs at the first distal knot during the running horizontal capsular closure, if varus is noted, untie the knot and proceed with less correction.
- The extra cost of the suture anchor is a drawback but should be weighed against the enhanced durability of capsular correction compared with a traditional capsulorrhaphy.
- Always check the position of the suture anchor under fluoroscopy before proceeding with capsular closure in order to ensure proper deployment and adequate osseous purchase.
- Suture anchor failure can cause misleading radiographic presentation or joint impingement.

Acronyms and Abbreviations:

- VAS = Visual analog scale
- AOFAS = American Orthopaedic Foot & Ankle Society
- HV = Hallux valgus
- HVA = Hallux valgus angle
- MTP = Metatarsophalangeal joint
- DVT = Deep venous thrombosis

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