



## JFAS Instructional Course

## Reverse Evans Peroneus Brevis Medial Ankle Stabilization for Balancing Valgus Ankle Contracture during Total Ankle Replacement

Thomas S. Roukis, DPM, PhD, FACFAS<sup>1</sup>, Mark A. Prissel, DPM<sup>2</sup><sup>1</sup> Attending Staff, Department of Orthopaedics, Podiatry, and Sports Medicine, Gunderson Health System, La Crosse, WI<sup>2</sup> Postgraduate Year III Resident, Podiatric Medicine and Surgery Residency Program, Gunderson Medical Foundation, La Crosse, WI

## ARTICLE INFO

## Keywords:

ankle prosthesis  
complications  
deformity  
musculotendinous imbalance  
total ankle arthroplasty

## ABSTRACT

Medial ankle instability secondary to deltoid ligament insufficiency is frequently encountered when performing total ankle replacement and remains a challenge. In the present techniques report, we describe a “reverse” Evans peroneus brevis tendon nonanatomic deltoid ligament reconstruction for medial ankle stabilization harvested through limited incisions using simple topographic anatomic landmarks. The harvested peroneus brevis tendon is brought through a drill hole in the talus from laterally to medially, aiming for the junction of the talar neck and body plantar to the midline. The tendon is brought superiorly and obliquely to the anterior medial aspect of the distal tibia where it is secured under a plate and screw construct. This modified Evans peroneus brevis tendon nonanatomic deltoid ligament reconstruction is useful in providing medial ankle stability during or after primary and revision total ankle replacement.

© 2014 by the American College of Foot and Ankle Surgeons. All rights reserved.

Medial ankle instability secondary to deltoid ligament insufficiency is frequently encountered with end-stage degenerative joint disease of the ankle (1,2) and can be problematic when encountered during or after primary and revision total ankle replacement (3,4). The deltoid ligament complex is the main restraint against valgus tilting of the talus and has 2 major subdivisions, the superficial and deep components (5,6) (Fig. 1). The tenet of soft tissue balancing during or after total ankle replacement involves release of the contracted soft tissue on the concave side and reinforcement on the convex side of the ankle (3,7).

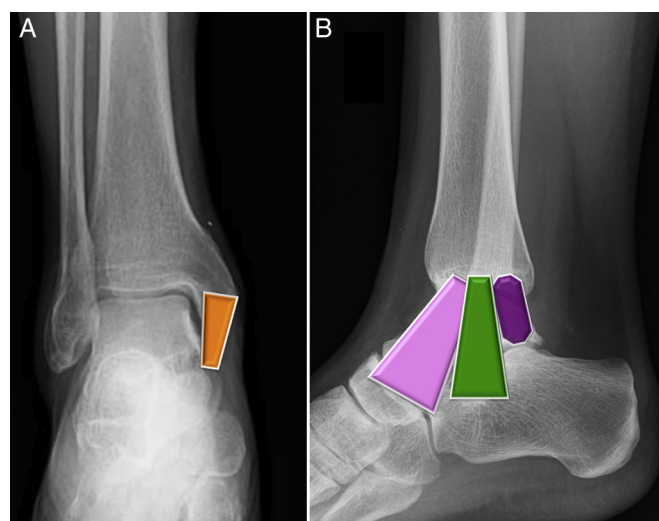
Valgus malalignment correction during primary and revision total ankle replacement has historically involved (1) removal of peri-articular osteophyte formation and debridement of the medial, lateral, and posterior gutters; (2) circumferential release of the lateral ligament complex off the distal fibula or lengthening osteotomy of the lateral malleolus; (3) correction of pedal deformities with lateralizing calcaneal osteotomy or medial column and isolated or combined midfoot and/or hindfoot arthrodesis; and (4) deltoid ligament plication and/or tendon transfer to reinforce medial soft tissue restraint (3,4,7–11).

**Financial Disclosure:** None reported.**Conflict of Interest:** None reported.

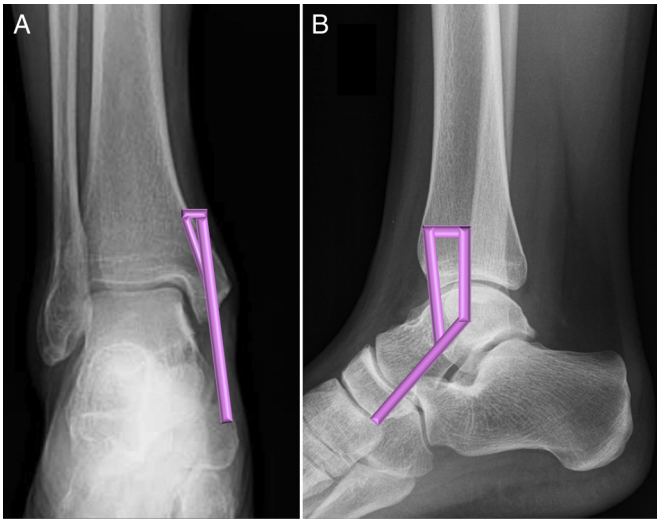
Address correspondence to: Thomas S. Roukis, DPM, PhD, FACFAS, Attending Staff, Department of Orthopaedics, Podiatry, and Sports Medicine, Gunderson Health System, Second Floor, Founders Building, 1900 South Avenue, La Crosse, WI 54601.

E-mail address: [tsroukis@gundersenhealth.org](mailto:tsroukis@gundersenhealth.org) (T.S. Roukis).

Multiple approaches to correct and stabilize medial ankle instability secondary to deltoid ligament insufficiency for stage IV adult acquired flatfoot, or traumatic injury and during total ankle

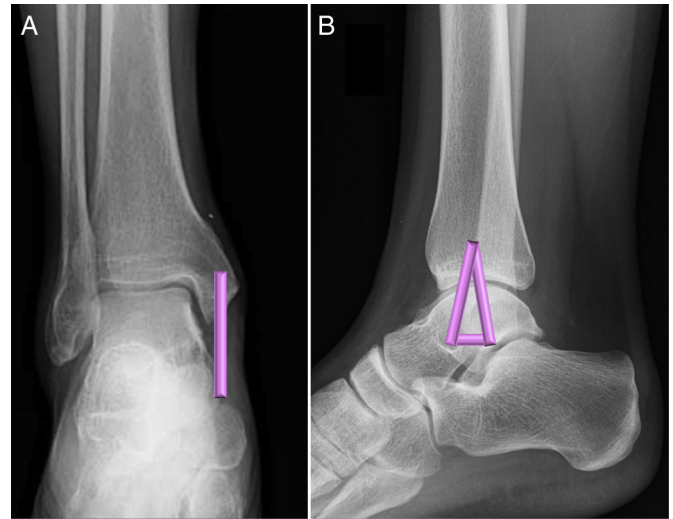


**Fig. 1.** The bands or fibers of the deltoid ligament are demonstrated on (A) anteroposterior and (B) lateral radiographs. The deep deltoid ligament is orange, tibionavicular band pink, tibiocalcaneal fibers green, and posterior tibiotalar band purple.



**Fig. 2.** Deltoïd reconstruction (purple lines) as described by Wiltberger and Mallory (12) (posterior tibial tendon autograft) demonstrated on (A) anteroposterior and (B) lateral radiographs. The posterior tibial tendon is divided longitudinally, and the superior half is left attached to the navicular distally but transected proximally. The freed portion of the posterior tibial tendon is brought through a vertically oriented drill hole in the medial malleolus from inferiorly to superiorly and then sutured back onto itself.

replacement have been reported (8,12–23) (Figs. 2 to 11). Many of these techniques involve multiple extensile incisions, appear quite complex and difficult to reproduce with precision, and add the cost of a cadaveric tendon allograft and specialized internal fixation devices. Therefore, a medial ankle stabilization procedure that uses autogenous tendon, is simple to perform, and is stabilized with readily available internal fixation is desired. A recently published modification of the Evans peroneus brevis lateral ankle stabilization to balance varus ankle contracture during total ankle replacement meets these desired criteria (24,25). The purpose of the present report is to describe a modification of the Evans peroneus brevis tendon transfer in which the tendon is harvested through limited lateral incisions using simple topographic anatomic landmarks (25). The harvested peroneus brevis is then transferred through a drill hole in the talus

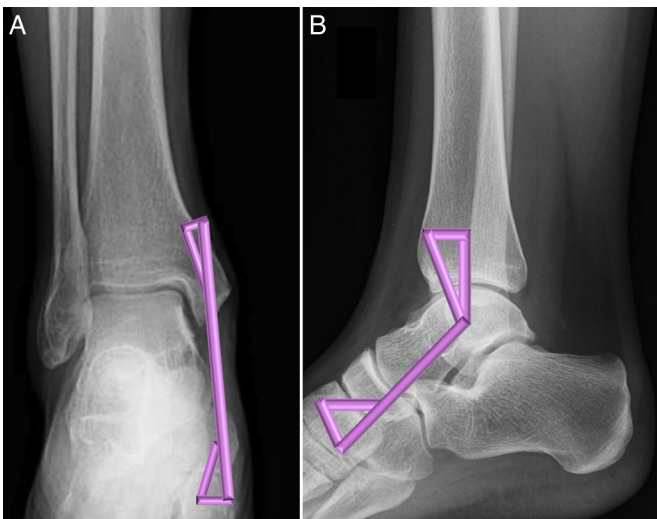


**Fig. 4.** Deltoïd reconstruction (purple lines) as described by Raikin and Myerson (15) and Lack et al (16) using regional tissues demonstrated on (A) anteroposterior and (B) lateral radiographs. Metallic suture anchors are placed in the medial malleolus and medial talar body, and the sutures are placed in the deltoïd ligament and regional tissues in a fan-like fashion, approximating them to the medial malleolus.

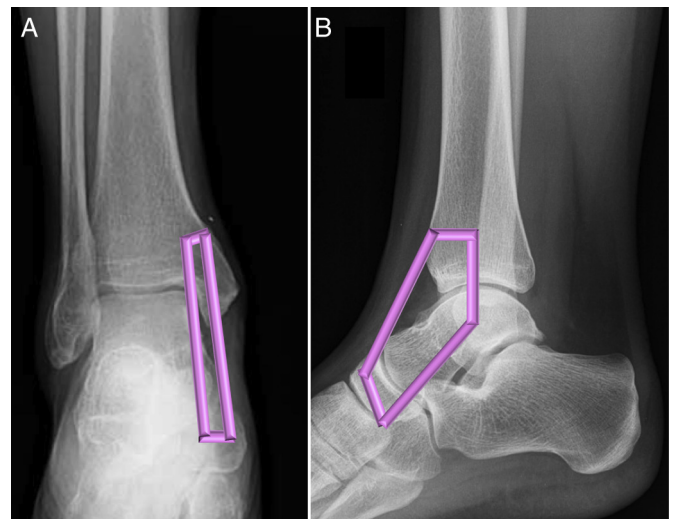
from laterally to medially and then secured to the anterior medial aspect of the distal tibia with plate and screw fixation (Fig. 12). Although not anatomic, this modified “reverse” Evans peroneus brevis tendon transfer is useful in reversing the medial ankle instability associated with longstanding valgus contracture during or after primary and revision total ankle replacement.

### Surgical Technique

Proper incision placement to harvest the peroneus brevis tendon is determined through the following sequence of topographic anatomic landmarks on the lateral aspect of the lower leg and hindfoot. First, the lateral aspect of the knee joint and the distal edge of the lateral



**Fig. 3.** Deltoïd reconstruction (purple lines) as described by Boyer et al (13) (free plantaris tendon autograft) and Kitaoka et al (14) (free extensor digitorum longus tendon autograft) demonstrated on (A) anteroposterior and (B) lateral radiographs. The free tendon autograft is passed through drill holes in the medial malleolus and medial cuneiform and then sutured back onto itself.



**Fig. 5.** Deltoïd reconstruction (purple lines) as described by Hintermann et al (17) (free plantaris tendon autograft) demonstrated on (A) anteroposterior and (B) lateral radiographs. The tendon is brought twice through a drill hole in the medial malleolus to the navicular and back to the medial malleolus and then sutured back onto itself.

Download English Version:

<https://daneshyari.com/en/article/2713058>

Download Persian Version:

<https://daneshyari.com/article/2713058>

[Daneshyari.com](https://daneshyari.com)