Scientific Research Publishing

Open Journal of Orthopedics, 2026, 16(2), 33-37
https://www.scirp.org/journal/ojo
ISSN Online: 2164-3016
ISSN Print: 2164-3008

# Modified Young's Tenosuspension Technique in Conjunction with Kidner Procedure in Flexible Flatfoot Patient: Technique Guide

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**How to cite this paper:** Chun, W.Y. and Rogers, S. (2026) Modified Young's Tenosuspension Technique in Conjunction with Kidner Procedure in Flexible Flatfoot Patient: Technique Guide. *Open Journal of Orthopedics*, **16**, 33-37.
https://doi.org/10.4236/ojo.2026.162004

**Received:** January 21, 2026
**Accepted:** February 2, 2026
**Published:** February 5, 2026



## Abstract

We developed a modified Young's tenosuspension in conjunction with the Kidner procedure that avoids keyhole creation, simplifies tendon rerouting while maintaining a plantar-medial directed tibialis anterior vector to reduce its first-ray dorsiflexory moment, and uses a locking-running suture construct for fixation. This technique is a technically accessible, reproducible, and adoptable option for dynamic medial arch support.

## Keywords

Modified, Young's Tenosuspension, Flexible Flatfoot, Navicular

## 1. Introduction

Young's tenosuspension has traditionally been used to treat flexible pes planovalgus deformity, either as an isolated procedure or in combination with tendo-achilles lengthening [1]. It is now commonly performed adjunctively with the Kidner procedure for medial arch stability [1]. In the traditional technique, the tibialis anterior tendon is rerouted without detaching its native insertion and secured through a keyhole slot created by either resecting or drilling the navicular. This preserves tendon continuity while enabling the remaining tendon to function as a dynamic sling for medial arch support [1] [2].

Although effective, this traditional technique is technically demanding and carries complications, including iatrogenic navicular fracture. This has led to simplified modifications, such as co-anchoring the tibialis anterior (TA) and posterior tibial (PT) tendons to the navicular tuberosity without a keyhole slot as an adjunct procedure with Evans calcaneal osteotomy [3]. However, literature on Young's

tenosuspension performed with the Kidner procedure, including technique guides, remains limited. To address this gap, our team developed a modified Young's tenosuspension technique that anchors both the TA and PT tendons to the plantar-medial navicular following accessory navicular resection, without a keyhole slot. This modified technique is indicated exclusively for patients with symptomatic accessory navicular.

## 2. Technique Guide

The patient is placed in a supine position on the operative table. General anesthesia is induced, followed by popliteal and saphenous nerve blocks. The extremity is prepped in standard sterile fashion.

1. A longitudinal dorsomedial incision was made over the navicular between the talonavicular (TN) and naviculocuneiform (NC) joints. Subperiosteal dissection was performed to expose the accessory navicular, with detachment of the posterior tibial tendon from the navicular insertion.

2. The accessory navicular was adequately resected with a sagittal saw without violating the talonavicular and navicular-cuneiform joints.

3. A 4.75-mm biocomposite SwiveLock (Arthrex, Naples, FL) anchor was inserted into the plantar-medial aspect of the navicular and was preloaded with two working sutures (Figure 1).

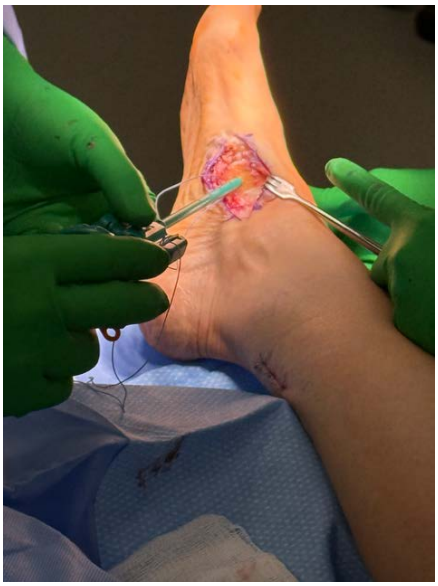

**Figure 1.** Clinical image of plantar-medial anchor placement on the navicular following accessory navicular resection.

4. Blunt dissection was performed to identify the anterior tibial tendon. The anterior tibial tendon was gently retracted medially. The first working suture from the anchor was used to secure the anterior tibial tendon in a locking-running fashion, and the construct was tightened using the opposing suture limb (Figure 2, Figure 3).

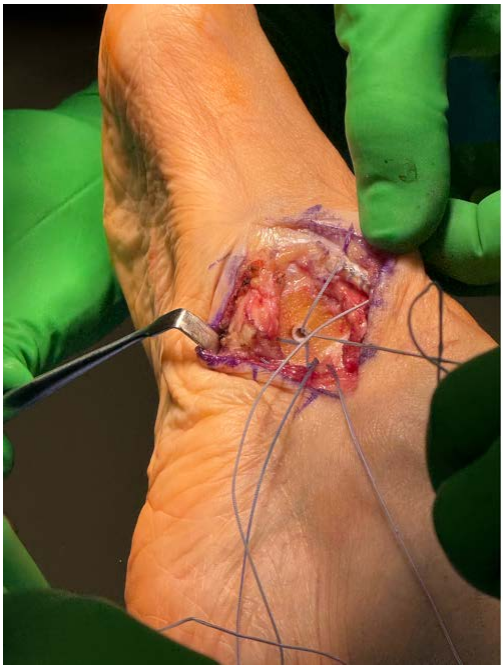

**Figure 2.** Clinical image demonstrating fixation of the tibial anterior tendon using a first working suture from the anchor in a running locking fashion prior to tensioning.

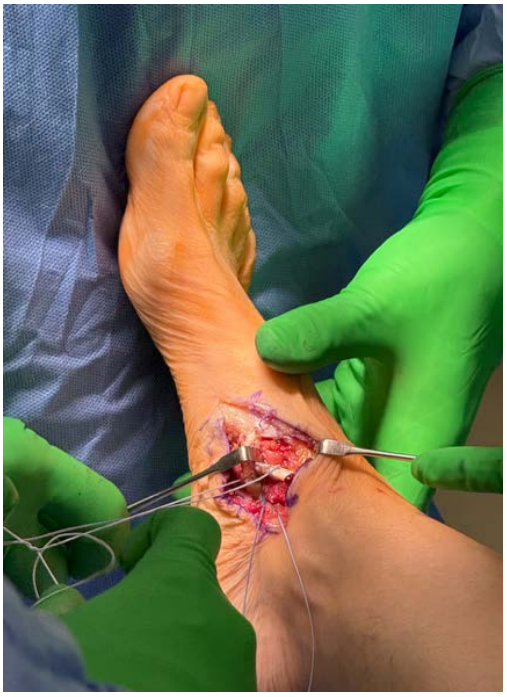

**Figure 3.** Clinical image of the final position of the tibialis anterior tendon prior to tensioning.

5. The second working suture from the anchor was used to secure the posterior tibial tendon in a locking-running fashion, and the construct was tightened using the opposing suture limb (**Figure 4**, **Figure 5**).

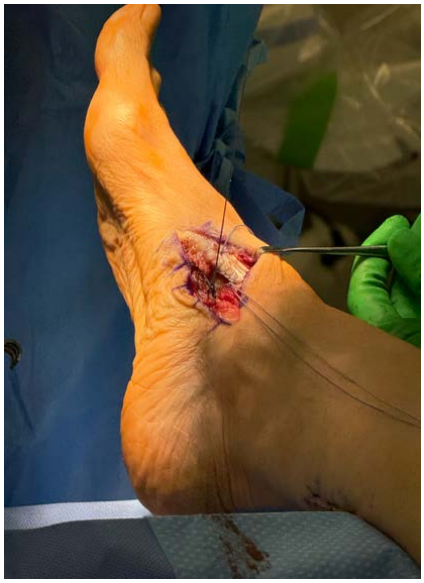

**Figure 4.** Clinical image demonstrating fixation of the posterior tibial tendon using a second working suture from the anchor in a running locking fashion following tensioning of the anterior tibial tendon.

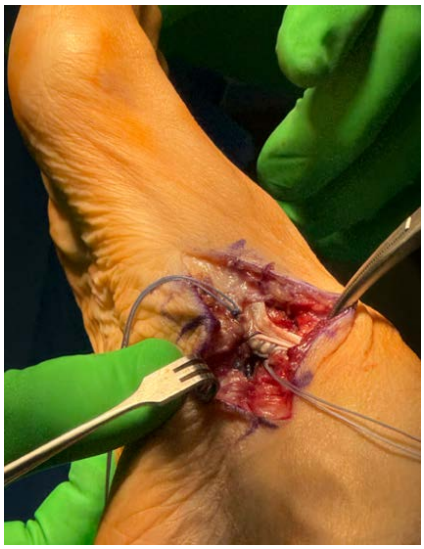

**Figure 5.** Final tensioning of both tibialis anterior and posterior tibial tendons, with both limbs seated at the plantar-medial aspect of the navicular.

Postoperatively, patients are placed in a posterior splint with a sugar-tong component and kept non-weight-bearing for at least 2 weeks with limb elevation until suture removal to facilitate edema control. Subsequently, patients are progressed to weight-bearing as tolerated in a CAM boot for an additional 4 - 6 weeks, followed by a gradual transition to regular footwear. In this case, the patient's incision healed without complication. This patient is currently ambulating in a CAM boot and is expected to transition to regular footwear within the next 1 - 2 weeks.

## 3. Discussions

We describe a modified Young's tenosuspension in conjunction with the Kidner procedure. The traditional Young's technique is technically demanding, particularly the creation of a navicular keyhole slot via drilling or resection and the rerouting of the tibialis anterior (TA) tendon. Consequently, Young's tenosuspension is not routinely performed in foot and ankle surgery, although its role in medial arch stability is well documented [4].

Our senior author routinely used our modified technique in conjunction with the Kidner procedure. Key technical pearls include anchor placement and tensioning technique using a running locking suture construct. By positioning the anchor at the plantar-medial navicular, the rerouted tibialis anterior tendon functions biomechanically as a plantar ligament supporting the medial arch alongside the reinserted posterior tibial tendon. This anchor placement also shifts the tibialis anterior tendon vector plantarly, reducing the first-ray dorsiflexory moment acting on the first ray. By decreasing the dorsiflexory force on the medial column, this configuration mechanically favors the peroneus longus, enhancing first-ray plantarflexion and promoting restoration of medial column alignment. Potential complications associated with anchor use include hardware prominence, irritation from footwear, and anchor pull-out. Independent tibialis anterior and posterior tibial tendon fixation followed by sequential tensioning of each limb in a running locking fashion, rather than simple suturing, enhances construct stability as well.

This technique is less technically demanding, reproducible, and readily adoptable, offering a simplified and mechanically rational alternative for dynamic medial arch reinforcement when combined with the Kidner procedure. Our senior surgeon has performed this modified technique in over 100 cases with consistently favorable clinical outcomes, defined by maintenance of dynamic medial arch stability on clinical examination, radiographic preservation of medial column alignment, and minimal post-operative pain based on patient-reported pain scores. Further large retrospective studies are warranted to evaluate procedural efficacy.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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