Overcorrected Flatfoot Reconstruction

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KEYWORDS

• Flatfoot • Overcorrection • Treatment • Cavovarus
• Posterior tibial tendon dysfunction

KEY POINTS

- The overcorrected flatfoot reconstruction, although less common than undercorrection, is a complex problem that is challenging to treat.
- A thorough evaluation, including the details of the index operation, is important in determining the cause of the patient's symptoms, which often resemble the cavovarus foot condition.
- Operative management of the overcorrected flatfoot should focus on the patient's specific symptoms and may not require complete reversal of the previous flatfoot correction.
- Combining osteotomies of the calcaneus, midfoot, and forefoot with soft tissue procedures may be sufficient for most revision cases.
- More severe or rigid deformities may require realignment hindfoot and/or midfoot arthrodesis.

INTRODUCTION

Treatment of the adult acquired flatfoot deformity (AAFD) has significantly evolved over the previous 20 to 30 years. Originally described as failure of the posterior tibial tendon, the concept of posterior tibial tendon dysfunction has persisted and been the topic of multiple studies.[1–3] Johnson and Strom[1] described their classification in 1989, which was later modified by Myerson[4] in 1997. Since that time, the complexity of the AAFD has been studied extensively and is currently better understood.[5–10] However, there is still significant debate regarding the appropriate reconstruction methods. As with all surgical procedures, complications and adverse outcomes can occur when complex reconstruction is performed. This article examines the clinical scenario of an overcorrected flatfoot deformity, how this occurs, and what treatment options are available.

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PATIENT EVALUATION OVERVIEW

Although overcorrection is a recognized complication after flatfoot reconstruction, undercorrection is significantly more common than overcorrection. For more information on undercorrection see Kenneth J. Hunt and Ryan P. Farmer's article, "The Undercorrected Flatfoot Reconstruction," in this issue. AAFD is a complex deformity with multiple clinical components that are interrelated. To better understand what occurs when overcorrection happens it is helpful to break down the physiologic components of the flatfoot deformity (**Box 1**).

Analyzing the treatment of each of the physiologic components outlined in **Box 1** helps to recognize which components are overcorrected. Surgical treatment of AAFD needs to be individualized for each patient and is typically based on the stage of the deformity. Because most patients undergoing surgical correction for AAFD are in the flexible stage II or rigid stage III categories, this article focuses on those two clinical scenarios. The first step in treating the overcorrected patient is to understand what exactly was done during the index procedure. Taking a thorough history and performing a careful physical examination is paramount to understanding the patient's complaint. If possible, reviewing and obtaining the operative report from the index procedure provides important information. Often a patient with an overcorrected flatfoot describes symptoms and has signs similar to the cavovarus foot. As with the patient with AAFD, however, it is similarly important to not oversimplify this clinical scenario and to individualize the treatment of patients with an overcorrected flatfoot. Standing foot (anteroposterior, lateral, and oblique) and ankle (anteroposterior and mortise) radiographs should be reviewed and compared with the patient's preoperative radiographs if available. Comparison views to the contralateral side help to determine the amount of relative deformity. It is important to remember to evaluate the ankle joint radiographically in addition to the foot to assess talar tilt as a possible cause of the deformity. Hindfoot alignment views are also important to determine the amount of hindfoot varus and for comparison with the nonoperative side (**Fig. 1**).[11] Advanced imaging, such as a computed tomography (CT) scan or MRI, is obtained depending on the patient's complaint, although it is often not necessary. CT scan is useful to determine presence of nonunion or arthritic changes as causes of the patient's pain. Weightbearing CT scans have become more available in recent years, which may help to further evaluate hindfoot alignment or possible areas of bone impingement

Box 1
Physiologic components of the adult acquired flatfoot deformity

- Insufficiency of the posterior tibial tendon with associated degeneration
- Stress/strain on the deltoid-spring ligament complex
- Stress/strain on the subtalar joint and transverse tarsal joint capsules
- Progressive hindfoot valgus and abduction through the transverse tarsal joints
- Plantar collapse of the talar head with associated rotation of the subtalar joint
- Shortening of the gastrocnemius-soleus complex and/or Achilles tendon
- Possible medial column collapse through naviculocuneiform and/or tarsometatarsal joint
- Overpull of the peroneus brevis with possible contracture
- Forefoot supination deformity to accommodate foot position and achieve plantigrade foot