

Subtalar Distraction Arthrodesis



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KEYWORDS

- Subtalar joint • Subtalar distraction arthrodesis • Achilles tendon lengthening
- Structural bone graft

KEY POINTS

- The subtalar joint can be altered in its anatomy and biomechanical behavior.
- It is important to know how to assess the talar declination angle in order to assess the deformity at the subtalar joint.
- Consider a straight posterior approach to the subtalar joint and remain liberal in the use of z-shaped Achilles tendon lengthening.
- A structural bone graft should be used to elevate the talus.
- Positioning screws should be used to lock the construct.

INTRODUCTION

The subtalar joint is fascinating and is essential in adapting the foot and ankle to different shapes of the ground. However, there are various causes that may irreversibly alter the anatomy and biomechanics of the subtalar joint leading to chronic impairment dysfunction.¹⁻³ The most important encompass calcaneal fractures, Charcot neuroarthropathy, avascular necrosis of the talus, and status after surgical treatment.⁴⁻⁶ Iatrogenic causes include nonunion and malunion after subtalar joint arthrodesis. In addition, even congenital causes, for example, residual clubfoot deformities, can end up in a grotesque hindfoot anatomy that affects the subtalar joint.^{7,8} In the presence of degenerative diseases, that is, arthrosis, and the indication to embark on surgery, these anatomic alterations become very important and should be taken into consideration.

The loss of height and possibly present lateral, subfibular impingement of the peroneal tendons may occur in the case of malunited calcaneal fractures, iatrogenic and/or congenitally distorted hindfeet as well, resulting in relevant impairment of the patients.

A surgeon needs to anticipate the problems of the subtalar joint and how to correct them properly. An in situ arthrodesis of a malunited calcaneus with massive talar

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declination after fracture will never address the accompanying loss of height and sub-fibular impingement.⁹

Therefore, subtalar distraction arthrodesis has become an important technique to address the problem of hindfoot deformity and arthrosis as well. The technique is used to restore height, correct heel width, and eliminate subtalar arthrosis.

INDICATIONS

As pointed out by Myerson,¹⁰ “the indications for a subtalar distraction arthrodesis are fairly specific.” They include certain conditions, whereby arthrodesis of the subtalar joint is required but also loss of hindfoot height is present. In those hindfeet, the talar declination might be negative with a consecutive anterior narrowing of the ankle joint. The narrow anterior ankle space could lead to limited dorsiflexion and ankle impingement syndrome (Fig. 1). Therefore, ankle range of motion and anterior ankle pain must be assessed. Although Myerson and Quill¹¹ reported the indications to be (1) loss of heel height >8 mm, (2) anterior ankle impingement due to abnormal talar declination angle, these values were strongly debated by Chandler and colleagues.⁴ In patients who do not demonstrate any loss of range of motion or who do not have pain may be candidates for an in situ subtalar arthrodesis. Similar indications were given by Chandler and colleagues,⁴ who recommended distraction arthrodesis only in patients with given findings of anterior ankle impingement. However, the biomechanics of the hindfoot will never be restored.

CONTRAINDICATIONS

Patients with impaired vascularity and concomitant brittle or scarred tissue are in danger to develop serious and precarious wound-healing problems.

In the case of talar necrosis, the surgery should be thought through because insertion of a bone graft needs adequate perfusion to allow proper incorporation. If possible, a vascularized medial femoral bone graft can be taken into consideration and connected to the posterior tibial artery.¹² However, the latter requires the presence of an experienced plastic surgeon.



Fig. 1. The narrow anterior part of the ankle joint ends after posterior declination of the talus.

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