

Subtalar Joint Arthrodesis

Open and Arthroscopic Indications and Surgical Techniques



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KEYWORDS

• Arthrodesis • Subtalar • Joint • Arthroscopy • Hindfoot

KEY POINTS

- Both arthroscopic and open subtalar joint arthrodesis techniques can successfully be used to treat conditions causing pain, deformity, or both.
- High fusion rates and functional improvement have been reported after both open and arthroscopic arthrodesis.
- Posterior and lateral arthroscopy of the subtalar joint have been shown to have few complications and high fusion rates.
- Arthroscopic subtalar fusion may be associated with higher fusion rates, shorter hospital stays, and fewer complications relative to open procedures; however, the two need to be compared further in order to definitively make that assertion.

BACKGROUND/ANATOMY

The talocalcaneal joint is formed by a combination of 3 articulating surfaces: the anterior, middle, and posterior facets. Its unique composition and the orientation of its facets allows for motion in 3 planes: inversion/eversion, flexion/extension, and abduction/adduction.¹ This triaxial motion, in combination with the plantar flexion/dorsiflexion of the tibiotalar joint, is critical for ambulation on uneven ground.^{1,2} The primary arc of motion of the subtalar joint is inversion/supination (25°–30°) and eversion/pronation (5°–10°) (**Fig. 1**).^{1,3}

The subtalar joint is also critical for normal foot mechanics and ambulation. With the subtalar joint everted, or in valgus, the transverse tarsal joints are unlocked, which allows a smooth transition from heel strike to stance phase. As gait progresses through stance phase, the hindfoot inverts; this locks the transverse tarsal joints,

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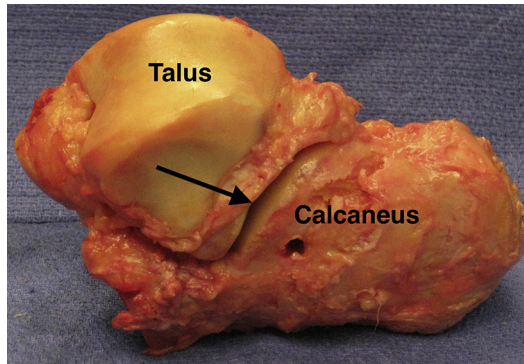


Fig. 1. Gross specimen of a talus and calcaneus (*left*) showing their relationship, as viewed from the lateral side. The arrow is pointing to the posterior facet.

providing a rigid lever and allowing propulsion forward.⁴ The biomechanics of the subtalar joint are therefore crucial to understanding correct and appropriate positioning of the subtalar joint when performing an arthrodesis.

SUBTALAR JOINT DISORDERS AND HINDFOOT DEFORMITY

Many different types of disorder can affect the subtalar joint and lead to pain, deformity, or both. These disorders include primary osteoarthritis, congenital conditions, inflammatory arthropathies, postseptic arthritis, posttraumatic arthritis, acquired conditions such as adult acquired flatfoot deformity, and chronic subtalar joint instability refractory to conservative treatments or reconstructive procedures (**Box 1**).^{1-3,5-14} Subtalar arthrodesis can be used successfully to treat all of these conditions, with the goal of

Box 1

Conditions affecting the subtalar joint

- Primary osteoarthritis
- Inflammatory arthropathy
 - Rheumatoid arthritis
- Congenital conditions
 - Talocalcaneal coalitions
 - Neuromuscular disorders (eg, cerebral palsy)
- Postseptic arthritis
- Posttraumatic arthritis
 - Calcaneus fracture
 - Talus fracture
 - Subtalar dislocation
- Acquired conditions
 - Adult acquired flatfoot deformity
 - Postpolio syndrome
- Chronic subtalar joint instability

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