Fractures of the Talus

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KEYWORDS

• Talus • Hindfoot • Tarsal • Fractures • Trauma

KEY POINTS

- Fractures of the talus are relatively rare injuries that usually occur as the result of high-energy trauma.
- The entire patient needs to be assessed, and more life-threatening injuries need to take priority.
- The soft tissue envelope around the hindfoot is tenuous and must be protected. At times, that may require emergent surgery to reduce and stabilize the bony deformity that is compromising the skin.

INTRODUCTION

The talus is the most proximal bone of the hindfoot that couples the foot to the leg. It is the second most common fracture of the tarsal bones, second in frequency to the calcaneous. However, overall injuries to the talus are relatively rare, and most surgeons have little experience in managing them. This article discusses fractures of the talus, including injuries to the talar neck, body, head, and processes. Although subtalar dislocations and osteochondral injuries are important topics, they are not addressed in this article.

The focus of this article will include:

Bony and vascular anatomy
Initial history/physical and radiographic assessment
Timing of surgery
Surgical approaches
Methods of fixation
Postoperative care
Outcomes and complication
Salvage and reconstructive procedures

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ANATOMY

Bony Anatomy

The talus is the connection between the ankle joint and the foot, with 60% of it being covered by cartilage. There are no muscular origins or insertions into the talus. Most authors break up bony anatomy of the talus into distinct anatomic regions: body, neck, head, lateral process, and posterior process.

The body of the talus is a large trapezoidal shaped dome. It is wider anteriorly than posteriorly. It has a convex superior surface to articulate with the weight-bearing plafond of the distal tibia. Medially and laterally it has cartilaginous surfaces that articulate with medial and lateral malleoli. Inferiorly, it has a concave articular surface that articulates with the posterior facet of the calcaneous.

The head of the talus is a convex round surface that articulates with the navicular bone distally and with the calcaneous plantarly through anterior and middle facets.

The neck connects the head to the body. It bears no articular surface. It originates from the medial side of the body and angles both plantarly and medially.

The lateral process originates from the lateral side of the body. Laterally and superiorly it has a cartilaginous surface that articulates with the distal fibula. Plantarly and medially it articulates with posterior facet of the calcaneous.

The posterior process is separated by the grove of flexor hallucis longus. It is covered by articular cartilage superiorly to articulate with distal tibia and plantarly to articulate with the posterior facet of the calcaneous.

Vascular Supply

All 3 distal arteries—posterior tibial, dorsalis pedis (anterior tibial), and peroneal artery—provide vascularity to the talus.[1]

The posterior tibial artery gives off a branch to the deltoid ligament and the artery of the tarsal canal. It is the most important supply to the talar dome. It is usually the last blood supply left remaining in type III Hawkins talar neck fractures. The deltoid ligament needs to be protected during surgery to preserve it.

The anterior tibial artery provides blood supply to the talar head and neck via the dorsalis pedis artery.

The perforation peroneal artery gives off artery of the tarsal sinus. Along with the artery of the tarsal canal, they form a vascular sling over the inferior talar neck; both provide supply to the talar dome.

There are extensive intraosseous anastomoses among the 3 arteries. It is potentially possible to restore blood flow to the talus if 1 of the 3 arteries remains undamaged.

INITIAL ASSESSMENT

Fractures of the talus are typically high-energy injuries, often seen after a motor vehicle accident or a fall from a great height. A thorough history and physical examination of the patient must be performed. Because these injuries occur in high-energy trauma, often the patient may have other injuries that need to be assessed and addressed. When appropriate, a full advanced trauma life support (ATLS) protocol needs to be performed, and life-threatening injuries should be addressed.

Injury to the talus is usually suspected when pain, swelling, and bruising at the ankle present, prompting initial radiographs. Typically an anteriorposterior (AP) and a lateral views of the ankle would be obtained in an emergency room setting. Once injury to the talus is diagnosed or suspected, more dedicated radiographic imaging should be obtained.