61 Talar fractures

Contents

61.1 Introduction

Talar fractures are relatively uncommon injuries, but they can be associated with significant complications. The talus is involved in about 2% of all lower extremity injuries and about 5-7% of foot injuries. Because it articulates with important joints (ankle, subtalar, and talonavicular), it is one of the most important bones to stabilize and mobilize soon after a foot injury. Talar fractures are usually associated with hyperdorsiflexion of the ankle as the talar neck impacts the anterior margin of the tibia, such as in a motor vehicle accident or fall from height.

61.2 Anatomy

The talus articulates superiorly with the tibia and fibula in the ankle mortise and the calcaneus and navicular inferiorly. Body weight is transmitted through the tibia to the superior surface of the talus. The anterior portion of the body is wider than the posterior portion, giving stability to the ankle. The neck of the talus connects to the head, which connects to the navicular and calcaneous and is the most vulnerable to fracture. The talus has no muscular or tendinous attachments, but has a groove for the flexor hallicus longus tendon. The majority of the talus is covered by articular cartilage. It articulates with the spring ligament inferiorly along the distal medial aspect, the sustentaculum tali along the medial inferior aspect, and the deltoid ligament direct medially at the level of the ankle.

The major blood supply to the body is from the artery of the tarsal canal (posterior tibial artery). Blood is also supplied by arteries to the sinus tarsi (peroneal and dorsalis pedis arteries); the deltoid artery (posterior tibial artery), which supplies the medial body; and the superior neck vessels (anterior tibial artery).

61.3 Classification

The most commonly used classification system is the Hawkins classification of talar neck fractures.

Type	Description
Type I	Nondisplaced talar neck fracture
Type II	Displaced with subluxation or dislocation of subtalar joint
Type III	Displaced with dislocation of body from ankle mortise
Type IV	Displaced with subluxation or dislocation of talonavicular joint

Other types of fractures include talar head fractures, talar body fractures, lateral process fractures, and posterior process fractures.

61.4 Clinical Presentation

Patients present with foot pain with painful range of motion and crepitus. Swelling and tenderness of the talus and subtalar joint may be present.

Other fractures of the foot and ankle are commonly seen, as these patients often have suffered a high-energy trauma. Also consider subtalar dislocation and total dislocation of the talus.

61.5 Imaging

AP, lateral, and mortise X-rays of the ankle and AP, lateral, and oblique views of the foot are highly recommended. The canale view provides the best view of the talar arch. CT scan will assess fracture pattern, displacement, and articular involvement. CT, MRI, and technetium bone scan can be used to evaluate for occult fracture. MRI can help detect avascular necrosis.

61.6 Treatment

Treatment for a Hawkins Type I fracture involves a short leg cast or boot for 8-12 weeks and no weight-bearing for 6 weeks. For Hawkins Type II-IV fractures, open reduction and internal fixation (ORIF) is recommended.

Lateral process fracture treatment is determined by displacement. If there is less than 2 mm displacement, use a short leg cast or boot for 6 weeks; the patient should be non-weight-bearing for 4 weeks. If there is more than 2 mm displacement, ORIF is recommended.

Posterior process fracture treatment is also determined by displacement. Non-displaced or minimally displaced posterior process fractures are treated with a short leg cast for 6 weeks and no weight-bearing for 4 weeks. For displaced fractures, ORIF is recommended.

Nondisplaced talar head fractures are treated with a short leg cast molded to preserve the longitudinal arch; partial weight-bearing is recommended for 6 weeks. ORIF is necessary for displaced talar head fractures.

61.7 Complications

The prognosis for talus fractures is related to the degree of damage to its blood supply and the damage to the articular surfaces. Complications are related to the degree of displacement as well as risk of avascular necrosis. One of the most common complications of talar neck fractures is avascular necrosis due to injury to the artery of the tarsal canal, which supplies the body, and branches of the dorsalis pedis and peroneal arteries, which supply the head and neck. Risk of avascular necrosis is stratified according to the Hawkins classification:

Hawkins Type	Risk of Avascular Necrosis
Hawkins Type I:	0-15%
Hawkins Type II:	20-50%
Hawkins Type III	20-100%
Hawkins Type IV:	100%

Open fractures can occur in 15-25% of injuries, reflecting the high-energy mechanism of injury. The infection rate is up to 40% in open talus fractures. Post-traumatic arthritis occurs in 40-90% of cases. Delayed union or nonunion occurs in approximately 15% of cases, and malunion is also a concern. Other complications include skin slough secondary to prolonged dislocation, interposition of the long flexor tendons, and foot compartment syndrome.

61.8 Outcomes

ORIF results in lower rates of nonunion, shorter time to union, earlier weight-bearing, better anatomical reduction, and lower rate of avascular necrosis than closed treatment. Outcome depends on accuracy of reduction, avascular necrosis, and degree of joint injury.