Research Article | Journal of Orthopaedic Case Reports 2025 March:15(3):Page 200-206

# Surgical Management Protocol of Hawkins Type 3 Comminuted Fracture Neck of Talus Case Series

Ashish Agrawal[1], Naman Gupta[1], Abhishek Jaiswal[1], Vivek Singh[1], Ashish Patidar[1], Yash Shihora[1]

**Learning Point of the Article:**

Following our surgical protocol ensures predictable and satisfactory functional outcomes in complex talus fractures.


## Abstract

**Introduction:** Talus fractures are troublesome injuries. It is very difficult to achieve good functional and radiological outcome in Hawkins type 3 comminuted fracture neck of talus.

**Caser Series:** In our study, 7 cases of Hawkins type 3 comminuted fracture neck of talus were operated in R.D. Gardi Medical College, Ujjain between August 2020 to August 2023 with the sequence of early closed reduction of dislocation and application of external fixator (SPAN) on the day of admission, followed by 3 dimensional computed tomography – scanning (SCAN) and then, definitive surgery through open reduction of fracture (through dual incision approach) and internal fixation with cannulated cancellous screws (FIX) along with Primary bone grafting.

**Results:** With the surgical management protocol followed by us, the union was achieved in all 7 cases. Hawkins sign was seen in all 7 cases by 10 weeks post-operatively. There was no incidence of complications, such as wound dehiscence and infections post-operatively. The present study had a minimum follow-up of 6 months.

**Conclusion:** Our Surgical management protocol led to excellent functional and radiological outcomes in all cases. Patients were able to return to their pre-injury functional activities along with full-weight-bearing walking without support within 6 months of surgery.


**Keywords:** Hawkins classification, comminuted talus fracture, primary bone grafting.

## Introduction

Fractures of the talus are difficult injuries. Talus fractures are renowned for the high incidence of unsatisfactory results, due to the comparatively frequent incidence of serious complications such as osteonecrosis. Since the early descriptions by Anderson and others of the "aviator's astragalus" fractures of the talus have earned a reputation as a problematic fracture [1].

Fractures of the talus are generally thought to be relatively uncommon. However, the talus is the second most commonly fractured tarsal bone. Most serious fractures of the talus are high-energy injuries. Fractures of the talar neck are commonly the result of a hyper dorsiflexion-type injury [1].

The most commonly used classification for talar neck fractures is that described by Hawkins [2] with the modifications suggested by Canale and Kelly [3], which relies mainly on displacement and dislocation, and therefore, suspected damage to the blood supply of the talus depending on its pattern of fracture displacement [2]. A Hawkins type I fracture is an undisplaced fracture, without any associated subluxation or dislocation

Access this article online

Website: www.jocr.co.in

DOI: https://doi.org/10.13107/jocr.2025.v15.i03.5388

*Author's Photo Gallery*

Dr. Ashish Agrawal | Dr. Naman Gupta | Dr. Abhishek Jaiswal | Dr. Vivek Singh | Dr. Ashish Patidar | Dr. Yash Shihora

[1]Department of Orthopaedics, R. D. Gardi Medical College, Ujjain, Madhya Pradesh, India.

**Address of Correspondence:**
Dr. Ashish Agrawal,
Department of Orthopaedics, R. D. Gardi Medical College, Ujjain 456006, Madhya Pradesh, India.
**E-mail:** drfriendlyashish@gmail.com

Submitted: 20/12/2024; Review: 18/01/2025; Accepted: February 2025; Published: March 2025

DOI: https://doi.org/10.13107/jocr.2025.v15.i03.5388

© The Author(s). 2025 Open Access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (https://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and non-commercial reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated.

neck, critical to maintain the vascularity of the talar body and to reduce tension on the skin, soft tissues, and associated neurovascular structures around the ankle.

The Talus bone has a complex anatomy and a unique blood supply. 60% of its surface is covered by articular cartilage and it has 7 articular surfaces. The inferior articular facets with calcaneus form the subtalar joint. The anteromedial surface and central trochlear surface, with the lateral process form the talar portion of the ankle joint. Talus does not have any muscular attachments to it [4].

component to it. A Hawkins type II fracture is a displaced vertical talar neck fracture with subluxation or dislocation of the subtalar/talocalcaneal joint. A Hawkins type III fracture is a displaced fracture spanning through the talar neck with dislocation at both the talocalcaneal and tibiotalar joints. The degree or the amount of displacement and dislocation is thought to be the primary assessing criteria of the interruption of its vascular status and therefore, the risk for the development of osteonecrosis as one of its dreaded complications. A type IV fracture is associated with a dislocation of the tibiotalar and subtalar joint, also with an additional dislocation or subluxation of the head of the talus at the talonavicular joint.

A Hawkins Type III fracture involves a dislocation at the ankle as well as at the subtalar joint. In this case, osteonecrosis is the rule rather than the exception with rates of nearly 100% [3].

Emergent reduction of the dislocated talus is one of the key principles in the management of type 3 fractures of the talar

Talar neck fractures are almost always due to high-energy trauma because the thick subchondral bone prevents it from getting fractured in a trivial trauma [5].

Talar neck fractures represent almost 50% of all talus fractures [6-9]. Because of the early recognition and extensive literature on this type of fracture, there are a number of radiographic views described to visualize the neck. Computed tomography (CT) scan is more effective at giving the surgeon a complete picture of the injury as well as information on the surrounding structures [10]. Although there have been volumes written on the classification schemes and complications inherent with these injuries, recent literature shows that early restoration of anatomy with rigid fixation offers the surgeon the best chance of a good result [11, 12].

The widely preferred approach for surgical treatment of talar neck fractures is a dual anterior incision technique [11, 13-16].



## Case Report

The study was conducted in the Department of Orthopaedics of R.D. Gardi Medical College, Ujjain, Madhya Pradesh from August 2020 to August 2023. In this study, 7 cases of Hawkins type 3 comminuted fracture neck of talus were admitted and treated by our protocol. Post-operative functional and radiological outcome was assessed in all cases. This study is an interventional case series.

Inclusion criteria were fresh (<24 h of injury) Hawkins Type 3 fracture Neck of the talus, age >18 years to <60 years, and no past history of any ankle trauma.