Talus Fractures: When and How To Fix

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Disclosure
I am a consultant and designer for Smith and Nephew (VLP Foot System)

Goals
• Understand how to plan surgery
• Understand why the two incision approach is important
• Understand how to adequately stabilize the fracture
• Technical pearls
• Understand the post-operative protocol
Anatomy

- Articular surfaces
  - Limited Realestate for fixation
  - Limited area for blood vessels to enter

Talar Neck Fractures - Overview

- Talus fractures
- Talar neck fractures – 50% of all talus fractures
- Hawkins’ (I thru IV)
  - Talar neck split – The higher the class, the greater the energy and injury, the higher the risk of AVN, the poorer the outcome
- Caveat – Most of the time AVN is “spoty” and not a major problem
- Arthritis is the most common problem

Talar Body Fractures

- 13 to 20% of talus fractures
- Shear fractures – go behind the lateral process (articular injury)
- Harder to see (scope)

Boyd and Knight –
- Type I – Coronal or Sagittal shear
- Type II – Horizontal shear
- Crush fractures
Talus Fracture Fixation –
The When

ORIF can be safely delayed until soft tissues are optimal unless:
- Open Fracture
- Dislocation
- Neurovascular compromise

Talus Fracture / Dislocation –
Technical Trick

1. These must be reduced urgently
2. Closed vs. open
3. ER vs. OR

Talus Fracture / Dislocation
Surgical Approach

- Always use a dual incision
- Single incision – Risk of malunion
- Extend the incisions proximally to perform the malleolar osteotomies
How Do You Decide Between Screws and Plates

Bone quality in the neck
- If adequate use screws (CT is helpful)

Advantages of screws
- Easy to use and fast (Cannulated)
- Inexpensive

Disadvantages of screws
- Poor fixation with comminution

If No Good Bone in the Neck (Countersink Screws in the Head)

Medial and Lateral approaches

Better option – plates?
- Less soft tissue stripping
- No violation of the TNJ.
For Thoroughness

Posterior to anterior screw fixation:
- Between Peroneal tendons and the FHL
- Insertion - lateral tubercle
- Parallel to the axis of the talus
- 3.5mm screws if possible
- Disadvantage –
  - Posterior impingement
  - Malalignment
- Dual incisions
- Functional outcome – favorable, minimal risk to local structures.

How Do You Decide Between Screws and Plates

Advantages of plats:
- Very stable construct
Disadvantages of plates:
- Expensive
- More time to place

Plate Options

Make your own:
- Any mini fragment systems
  - Locking [fails in holes that are bent] vs. nonlocking
  - Difficult and time consuming

Custom Talar neck plates:
- Anatomic medial and lateral
  - Easy to apply
  - Very stable
  - Variable locking
Technical Pearl – Talar Neck Comminution

Crushed medial neck
Fibular graft to correct varus

Plates Vs. Screws – Plates Provide Excellent Stability

Aleuriau Chateau PB, et al. JOT 2002
Maceroli MA, et al. JOT 2016 –
Nonunion – (11.5%)
Malunion – 0
AVN – 27%
PTA STJt – 38%

Talar neck fracture Outcomes - Guarded.

They heal, malunions occur
Poor ROM
Fair Functional outcomes
Frequently painful
High rates of arthritis
AVN rate increases with severity
Complications –

- Post Traumatic Arthrosis
  - Arthrodesis
  - Often asymptomatic
  - Arthrodesis if symptoms
- Delayed Union / Nonunion – rare
  - (open, high energy fractures)
- Malunion –
  - Usually in Varus
  - Salvage – Osteotomy vs. Fusion
- Osteomyelitis

Surgical Pearls For Talar Body Fractures

- Radiolucent footboard
- Use distraction –
  - Calcaneal traction - difficult
  - Temporary external fixation
- Arthroscopic assistance is invaluable
- Have all necessary implants –
  - Small K-wires
  - Bioabsorbable pins
  - Minifragment plates and screws (cannulated vs. solid)
- Be biologically friendly

Medial Malleolar Osteotomy

- Medial – Chevron vs. oblique vs. step-cut
- Do not strip all tissues
- Protect the posterior tibial tendon
- Sagittal saw with saline cooling
- Complete with an osteotome
- ORIF with 2 screws
- Prevaril
Lateral Malleolar Osteotomy

- Short Oblique
- Leave posterior soft tissues intact – rotate the fibula posteriorly
- Protect the peroneal tendons
- Plate vs screws
- Repair lateral ligaments

Technical Pearl – Avoiding Osteotomies

- Dry Arthroscopy

Talar Body Fractures – Type I Coronal Shear Injury

26 y/o: man s/p MVA
Talar body fracture with extension into the neck and medial malleolus fracture
Talar Body Fractures – Type I Coronal Shear Injury

- ORIF using the medial malleolar fracture as an “osteotomy”

Crush Injury of the Talar Body

19 y.o. man s/p MVA

ORIF – plates, screws, PLLA pins
Temporary spanning ex-fix
Talar Body Fractures – Guarded Prognosis

- Int Orthop. 2007 Jun 22; Ebphaim NS, et. al.
- Vallier HA, et. Al. JBJS Am. 2004
- Frequent early complications, most – AVN and/or PTA
- Worse prognosis - Associated talar neck fractures and open fractures
- Lindvall E, et al. JBJS Am 2014

Post-operative Management

Early motion once the wounds have healed (if possible)
No weight bearing until healing occurs (Approximately 12 weeks)

Summary

- Urgent treatment – Dislocations, Open fractures
- Dual Incision
- No comminution – screws
- Compression – plates
- Body fractures – distraction and dry scope, ostentomies as needed
- Guarded prognosis
  - PTA – frequent

- Thank you
Case Study

2 weeks heavy serosang D/C

4 months