

LIMB SALVAGE FOLLOWING TRAUMATIC TALAR EXTRUSION WITH SOFT TISSUE RECONSTRUCTION: A CASE REPORT



North Shore Long Island Jewish Medical Center
New Hyde Park, NY, USA 11040

Aziz R. B.S., Goldman A. M.D.



Background

Severe open talus fractures with near-complete ankle disarticulation are rare, limb-threatening injuries associated with:

- High risk of infection
- Avascular necrosis/osteonecrosis
- Significant bone loss
- Potential need for amputation

Successful limb salvage requires a multidisciplinary approach addressing:

- Infection control
- Skeletal stabilization
- Bone reconstruction
- Soft tissue coverage

Case Presentation

A 57-year-old male was transferred as a level 1 trauma activation after a fall from a ladder resulting in a near-complete traumatic amputation/disarticulation of the left ankle and foot.

Initial findings:

- Mangled lower extremity with severe soft tissue disruption
- Cold, pulseless foot
- Restoration of perfusion following reduction (Image 1).
- Extensive talar comminution and extrusion
- Amputation was initially considered due to injury severity



Image 1: Gross image of extruded talar body fragment following high-energy open ankle trauma (10/16/23), with visible intact articular surface.

Initial management:

- Intravenous broad-spectrum antibiotics
- Emergent irrigation and debridement
- External fixation for stabilization (Image 2)
- Vancomycin/tobramycin-impregnated PMMA beads for (Image 2):
 - Local antibiotic delivery
 - Dead space management

Surgical Management

Fracture Classification:

**Gustilo-Anderson Type IIIA Open Talus Fracture
Hawkins IV Talar Extrusion Injury**

- Approximately 30–40% loss of talar bone stock, with soft tissue compromise
- Post-traumatic devascularization

Staged reconstruction

- Removal of external fixator
- Ankle and subtalar arthrodesis
- Hindfoot nail fixation (Image 3)
- Structural Harms titanium mesh cage reconstruction (Image 3)
- Bone graft augmentation

Postoperative complications:

- Osteomyelitis requiring multiple procedures:
- Hardware removal
- Sequestrectomy
- Vacuum-assisted closure therapy
- Repeat external fixation
- Antibiotic spacer bead placement



Image 2: Fluoroscopic views showing application of spanning external fixation and placement of antibiotic-impregnated polymethylmethacrylate (PMMA) beads for management of open ankle injury (12/8/23)

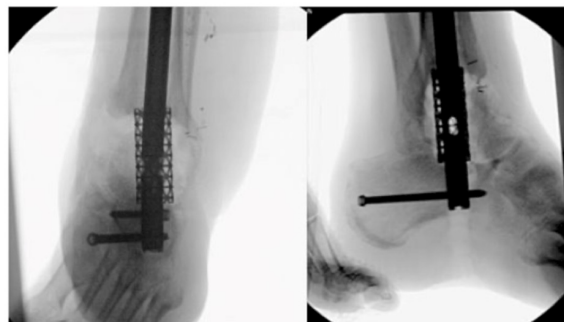


Image 3: Fluoroscopic images demonstrating definitive stabilization with hindfoot intramedullary nail fixation and locking screw placement (2/6/24).

Soft Tissue Reconstruction

Due to compromised vascularity and extensive soft tissue loss, **plastic surgery was performed:**

- Free anterolateral thigh (ALT) flap coverage
- Microvascular anastomosis to the anterior tibial artery
- Subsequent flap debulking and optimization

Following soft tissue coverage:

- Revision hindfoot fusion
- Harms cage reconstruction
- Additional bone grafting

Conclusion

This case demonstrates that limb salvage is possible following severe open talus injuries through a coordinated orthoplastic approach.

Key principles include:

- Early debridement and antibiotic therapy
- Staged skeletal reconstruction
- Management of bone loss with structural implants
- Vascularized soft tissue coverage
- Despite extensive bone loss, vascular compromise, and postoperative infection, multidisciplinary reconstruction allowed preservation of limb function.



Image 4: Two-year follow-up radiographs demonstrating successful ankle and subtalar fusion (2/25/26).

Acknowledgements

The authors gratefully acknowledge Northwell Health for its support of this work. We also thank the multidisciplinary orthopedic trauma, plastic surgery, vascular surgery, infectious disease, nursing, and rehabilitation teams whose collaborative expertise and dedication made successful limb salvage and recovery possible.