

Charcot Foot Reclamation: Heel with Steel

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Diabetic Neuroarthropathy

- Progressive instability of joints
 - Glycolization of collagen
- Progressive Deformity
 - Neurologic motor loss distal to proximal
- Progressive bony destruction
 - Result of **repetitive** trauma
 - Loss of neurologic feedback

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Charcot Arthropathy

- Classification: Charcot process
 - Phase I: Dissolution - Active
 - Phase II: Coalescence - Resolving
 - Phase III: Consolidation - Process done



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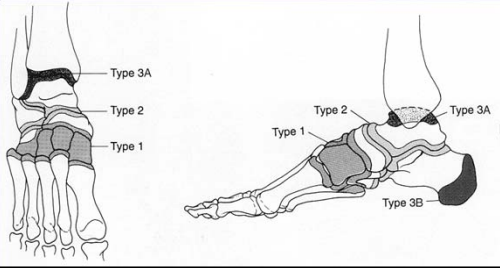
Diabetic Neuroarthropathy

- Results of untreated Neuroarthropathy
 - Collapse of foot structure
 - Chronic recurrent ulceration
 - Not shoeable due to deformity
 - Unable to support weight
 - Amputation of foot

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Charcot Arthropathy

- Classification: Charcot location



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Treatment Goals

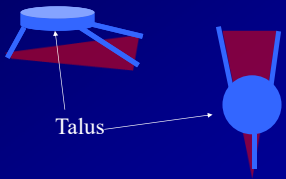
- Provide a stable weight bearing platform that can fit in a shoe
- Protect skin from breakdown
- Preserve ankle joint

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Stability Modelling

“3-legged” stool principle

- Stability of stool depends on leg position



Talus

- Talar position needs to be balanced to prevent overload at ankle

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Surgical Indications

- Acute fracture or dislocation in foot
 - Restore foot anatomy
 - Fuse joint instabilities
 - Protect essential joints
- Recurrent ulceration
 - Remove bony prominence
 - Stabilize foot
- Unstable deformity
 - Reconstruct foot alignment

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Surgical Candidates

- Has adequate vascular supply
 - Palpable pulse
 - Toe pressures or TcPO₂ >40mmHg
- Controlled diabetes
 - α hydroxy hemoglobin < 8.5%
- Understanding of the care needed
 - Absolutely no weight bearing till healed

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Surgical Timing

- 2 windows of opportunity
 - At the time of the initial event
 - After resolution of Charcot process
 - Bony changes stable
 - Edema and warmth gone
 - Protect in total contact cast till stable

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Charcot Arthropathy

- Ligamentous instability is the initial stage



9 month
progression



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What causes this pattern?

- Unchecked muscle action
 - Tibialis anterior
 - Tibialis posterior
 - Peroneal tendons
 - Achilles

WT BEARING

WT BEARING

The image contains two X-rays of a foot under weight-bearing conditions. The top X-ray is a lateral view showing the foot's structure under load. The bottom X-ray is a medial view showing the foot's structure under load. Both X-rays show a significant increase in the angle of the metatarsals, consistent with the progression shown in slide 13.

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Surgical Issues

- This is NOT a reconstruction
- This is a salvage operation
 - The foot is not normal
 - Goal is to prevent recurrent breakdown of soft tissue
- Sometimes amputation is a better option

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■ Primary Amputation:

- Loss of calcaneal structure almost impossible to make structurally stable
- Lack of bony response bad sign



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Charcot: Treatment

- Total Contact cast during active phase
 - Change 1-3 weeks
 - Initial non weight bearing
 - Continue till coalescence
 - Attempt to minimize deformity



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Joint Instabilities in Diabetics

- Acute instabilities should be stabilized
 - Acute fusion for joint instabilities
 - Rigid fixation a must
- Toe instabilities best handled by amputation
 - Impossible to protect skin from pressure
 - No stable motor control
- Achilles lengthening a must

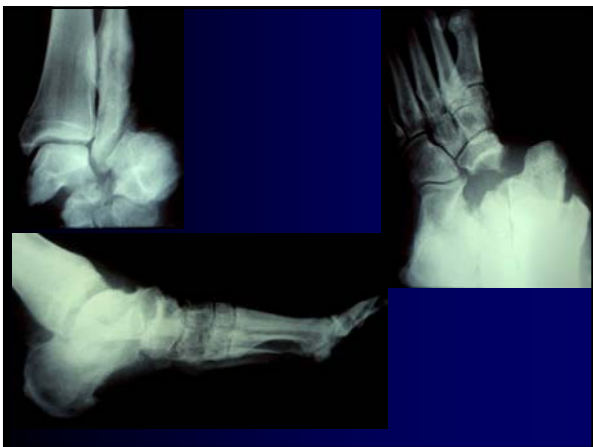
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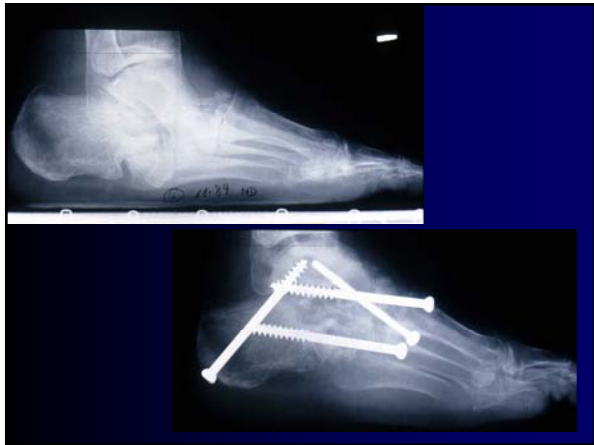
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Evolution of fixation for Charcot

- First presentation in 1996 this treatment called "malpractice"
- Literature now vigorously supports salvage over amputation
- Specific plating
- Axial Fixation

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Stronger plates / screws

- 4.0 and 5.5mm screws

Osteopenic Screws
All 3DI screw holes accept 4.0 and 5.5mm non-locking and polyaxial locking screws.

Wright Medical

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Axial Fixation

- Intramedullary fixation to support column

A 3D rendering of a vertebra showing intramedullary fixation. A central canal is visible, and a locking screw is shown inserted into the canal to support the column.

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Chronic recurrent ulcer

- Charcot mass stable
- Severe forefoot hindfoot mismatch

Two X-ray images of a foot. The left image shows a dorsal view of the foot with a Charcot mass. The right image shows a lateral view of the foot with a severe forefoot hindfoot mismatch.

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Axial Fixation

- Threaded bolts with “locking” capability

A BRIDGE BEYOND THE EVOLUTION OF CHARCOT TREATMENT

Extremity medical Wright med

The image contains two diagrams. The left diagram shows various locking bolts and washers on a grid background. The right diagram is an anatomical illustration of a foot with a long locking bolt inserted into the metatarsal.

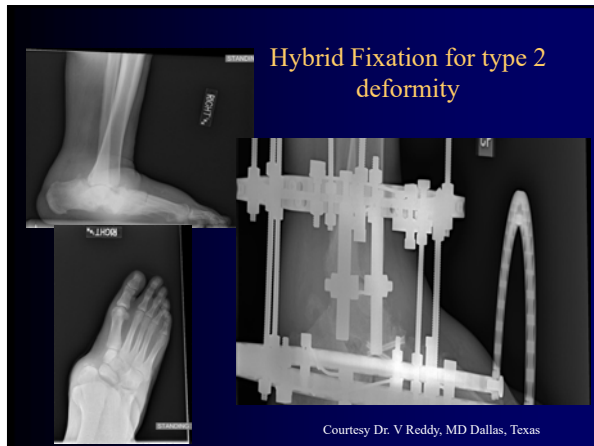
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Axial Fixation

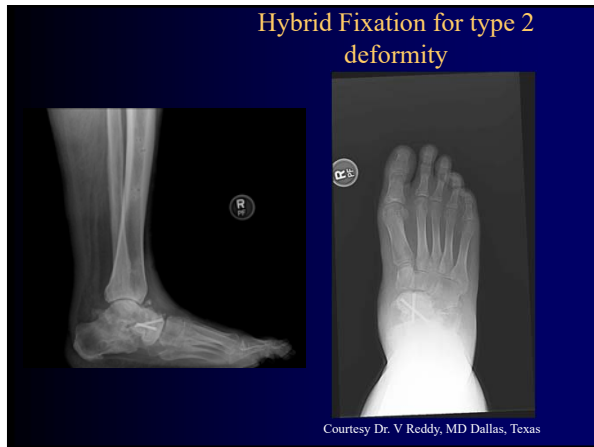
- Locked compressible nails for medial and lateral stabilization
 - Stryker T2-ICF

An anatomical illustration of a foot showing two long, locked compressible nails inserted into the metatarsals for stabilization.

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My Thoughts on Fixation

- Intramedullary better than peripheral
 - Easier on softtissue
 - Stronger than plating
- Locked better than blocked
- Axial compression never bad
- Even with midfoot subtalar complex should be included

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Diabetic Surgery :Post Op

- Casted dressing up to 3 months
- Strict non weight bearing
 - Radiographic evidence of healing
 - Absence of edema
- Gradual advancement of weightbearing
 - Cast
 - AFO (permanent if ankle fused)
- OR circular frame suspension of foot
 - Allow limb weight bearing through tibia

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Diabetic Foot Salvage

- Be sure vascular supply adequate to heel
- Remove bony prominences
- Release / lengthen Achilles
- Restore plantigrade foot position
- Careful patient selection

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