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- Doctor of Podiatric Medicine.
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  - Foot Surgery.
  - Rearfoot Reconstruction and Ankle Surgery.
Topics

- Introduction
- Etiology
- Charcot Process
- Pathology
- Treatment
- Cases
- Take home points
Introduction

• **Neuropathic** form of arthropathy that leads to
  – Bone destruction
  – Fragmentation
  – Dislocation
  – Joint collapse.

• Foot deformity that is at high risk for ulceration and **limb loss**.
Etiology

• Anything that causes **peripheral neuropathy**.
  – **DIABETES**
    – Alcoholism
    – Leprosy
    – Syphilis
    – Syringomyelia
    – Spinal cord lesions
    – Others
Charcot Process
Charcot Process
initial presentation

• 53 yo DM female.

• HgA1C was 10.8

• 2\textsuperscript{nd} metatarsal stress fracture.

• NWB.
2\textsuperscript{nd} metatarsal stress fractures
Charcot Process
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Charcot Process

- Midfoot Charcot.
- Most common site.
- 40% of cases.
- Can be triggered by minor trauma.
Charcot Process
Levels of involvement in Diabetic Charcot foot:

- Ankle joint (10%)
- Calcaneus (5%)
- Naviculocuneiform joints
- Talonavicular & Calcaneocuboid joints

40%: LisFranc - Tarsometatarsal joints

15%: IPJs & phalanges, MPJs & metatarsals

Uceration
Pathogenesis

• Neurovascular vs. Neurotraumatic Theories.

• Combination of sensorimotor deficits, microtrauma, osteopenia, hyperemia and joint instability that results in Charcot.
Charcot Process

- Destruction of afferent nerve fibers.

- Unrecognized trauma to joints.

- Severe degenerative changes, osteophyte formation, subchondral fractures, and calcification in surrounding tissues.
Common Findings

• DM duration 10+ years.
• Unilateral.
• No sex predilection.
• DM Type 1 and 2.
• Poor glycemic control.
• Peripheral neuropathy.
Initiating Events

- Trauma (fractures)
- Minor trauma (sprains)
- Increased activity.
- Local surgery.
Diagnosis

• High index of suspicion.
• **Neuropathic** patient with a red, hot and swollen foot/ankle.
• Pain despite neuropathy.
• Rule out other possibilities (OM)
• Temperature measurements.
  – 10 degrees higher than contralateral foot.
Differential Diagnosis

• **Cellulitis**
  – Elevated CRP and ESR.

• **Gout**
  – Elevated uric acid or positive fluid analysis.

• **DVT**
  – Positive venous duplex.

• **Osteomyelitis**
  – Presence of an ulcer.
  – Bone biopsy.
Treatment

• Goal is to prevent joint collapse, amputation, maintain ambulation and keep/make the patient braceable.

• Immobilization and NWB.

• Total contact casting.
Conservative Treatment

- Immobilization
- Bracing (CAM, CROW, AFO)
- **Total Contact Casting**
- Jones Compression
- Custom Molded Shoes
- Wound Management
Surgical Treatment

- Exostectomies
- Rotational Skin Flaps
- Tendon Transfers
- Achilles Tendon Lengthening
- Arthrodesis:
  - Internal vs. External
- Amputation
Internal Fixation
initial presentation

- 72 yo DM/RA female.

- 2 year history of instability and pain.

- Neuropathic.

- Failed conservative treatment and bracing.
• Tibio-talo-calcaneal (TTC) Arthrodesis.
Internal Fixation
eight weeks post-op
Combined Internal and External Fixation
High Index of Suspicion

• A DM patient with neuropathic who presents with a warm, red and swollen foot is Charcot until proven otherwise.
Take Home Points

• **Early diagnosis** and treatment is key.
• Debilitating condition.
• **Immobilization** is generally effective.
• Surgical treatment is individualized to each patient.
• Importance of post-op expectations and glucose control.
References


THANK YOU!

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