Charcot Arthropathy

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What is Charcot Arthropathy?

- Also known Charcot Foot
- Most commonly seen in individuals with diabetes mellitus (DM)
- Results from nerve damage and poor circulation common to DM
- Begins as inflammatory condition, ultimately affecting bones, joints, soft tissue of foot and ankle, and leading to foot deformity

AAOS (2011)
Charcot Foot: severe deformity due to ankle joint breakdown

AAOS (2011)
Some statistics about DM

- 8.3% of US population has DM (25.8 million, diagnosed and undiagnosed)

- 60-70% of people with DM have mild to severe neuropathy, which can result in impaired sensation

- ~9% of those with diabetic neuropathy develop Charcot foot

- Most will be in their 50s and 60s and have had DM for 10-20 years

Charcot Foot Progression

- DM results in decreased circulation, which in turn weakens bones and makes fracture more likely

- Neuropathy leads to loss of sensation in feet, so patients do not feel fractures

- As patient continues to walk on broken foot, bone fragments can develop and pressure of the fragments on skin result in decubitus ulcers

- More fractures develop and joints dislocate

AAOS (2011)
Signs and Symptoms

- Profound unilateral swelling
- Locally increased skin temperature
- Erythema
- BUT no pain, or less pain than expected
- No skin openings
- X-rays may appear normal
- Synovial joint biopsy is definitive; bone fragments will be in joint

Witmer (2004)
Bone fragments lead to ulcer

(Left) This patient with Charcot of the ankle has developed a deformity that places abnormal pressure on the outside of the ankle. (Right) This pressure has led to the development of a chronic sore (ulcer) that can be extremely difficult to treat (AAOS 2011).
How is Charcot Foot treated?

- Prevention is the best treatment!

- Nonsurgical: casting to reduce swelling, protect bones, for 3 months or more with changes every 1-2 weeks (NWB), followed by custom made shoe

- Surgical: if protective footwear not effective
  - Achilles tendon lengthening
  - Removal of bony prominence on inferior foot
  - Repair/ reconstruction

AAOS (2011)
(Top) In this x-ray taken from the side, the patient has unstable Charcot of the back of the foot. The dislocation of the joints is seen where the two bones in the back of the foot do not line up (arrowhead). (Bottom) A complex realignment and fusion was performed to prevent the patient from developing a prominence and ulceration (AAOS 2011).
What does this mean for us?

- Clinician observation of key symptoms to report to PT/physician
- Patient education: diabetes self care
- Gait training with cast and AD (NWB)
- Post-surgical ankle muscle strengthening and stretching*

*Dutton (2012)
How to Assess Intervention?

- Difficult to clearly assess interventions just mentioned b/c patient outcomes affected by health and health behaviors (not just by intervention)

- To assess DM teaching concerning prevention: tracking decubitus stages and # new ulcers over time

- To assess gait training with AD and post-surgical therex: RoM/ MMT, Functional Gait Assessment (FGA) (Wrisley et al. 2004), measured over time
References and Additional Resources

- **References**

- **Additional resources**: ADA, AAOS, AAFP
Conclusion

- Any questions?
- What do you know now?
- How was the presentation?