WHY SURGICAL MANAGEMENT FOR THE CHARCOT FOOT & ANKLE?

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APMA CONTROVERSIES 7.13.19
LET’S BATTLE…..

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THE CHARCOT EXTREMITY

- Severe negative impact on health related quality of life (Raspovic, 2014)
- The “non-plantigrade” Charcot foot is likely to develop progressive deformity, wounds, or infection (Wukich, Bevan)
- Paradigm shift to evolve from simple limb preservation to a modern goal of achieving plantigrade limb supported with therapeutic foot wear.
- 12X more likely to undergo major amputation if Charcot patients develop wound (Sohn, 2010)
  - Intervention early

How can this be achieved?
TO OPERATE... THAT IS THE QUESTION?

- Quality of published data of surgical management much improved over the past several years
- Evidence concerning timing of treatment and use of different fixation methods still inconclusive
  - Acute vs chronic intervention
    - Early surgical mgt leads to better outcomes (Mittlemeier, Pakarinen)
      - "Early surgical reconstruction in high-risk patients can provide timely restoration of a plantigrade and stable foot and improved quality of life of the patient at complication rates comparable to those after secondary surgery following failed nonoperative treatment"
  - Soft tissue envelope/edema optimized
  - Instability must be managed acutely
- Increased technical skill, knowledge, and advances in fixation, deformities are becoming more manageable (Burns, 2008)
  - Disease specific implants
  - Custom 3D models
HISTORY SHOULDN’T ALWAYS REPEAT ITSELF….

- Treatment with accommodative bracing **historic** based on low level anecdotal opinion
- Poor reported outcomes comparable to quality of life scores as major amputation (Pinzur, 2016)
- Custom bracing encumbering, especially in obese patients
  - Source of wounds, etc

- Increasing interest in correction of the deformity with the development of newer implants for “Charcot” bone
Indications for Surgery
- Infection
- Non healing ulcerations
- Inability to ambulate
- Alternative to amputation
- Persistent edema or pain
- INSTABILITY
- Disease progression

Principles of Surgery
- Lengthening of Posterior Muscle Group
- Internal Fixation
  - Midfoot: screw-plate, “beaming”
  - “super construct” (Sammarco,)
- MF/HF Realignment
  - Ankle/Hindfoot: IM nail
- External Fixation
  - Bone resections, talectomy, exostectomy
SURGICAL STATISTICS

- Midfoot (43.5%) – Type 1
- Hindoot (41.6%) – Type 2
- Ankle (33.8%) - Type 3A
- 54 year review (Lowery, 2012)
SURGICAL MANAGEMENT

- External Fixation
  - Utilized in deformities with ulcerations, infections
  - Staged for definitive treatment
  - Arthrodesis through frame
THE STAGED PROCEDURE
STABILIZING HF AND ANKLE TO TREAT MF DEFORMITY
SUPPORTING STUDIES

- Pinzur, 2018
- Foot and Ankle International
- 214 pts reconstructed
- Operative correction led to 80% (173/223) achievable plantigrade limb, functional goal of independent ambulation in therapeutic footwear
  - Deformity driven
    - Valgus>Dislocation>Varus
- Ettinger, 2016
- JFAS
- 58 pts
- Reconstruction with tibiotalocalcaneal or tibiocalcaneal arthrodesis
- 94.2% gained independent immobilization
- 96.6% said would undergo surgery again
SUPPORTING STUDIES

- Grant, 2009
- JFAS
- 50 consecutive charcot salvage procedures
  - Fusion rates
    - Tripe: 85%
    - MF: 78%
    - LisFranc: 83%
  - Low reulceration rate (6.25%)
  - Improved quality of life
  - Low rate of amputation

A retrospective analysis of 50 consecutive Charcot diabetic salvage reconstructions.

Grant WP, Garcia-Lavin SE, Sabo RT, Tam HS, Jerlin E.

Abstract
Between January 2000 and May 2003, 50 consecutive Charcot diabetic salvage procedures were performed on 44 patients (average age 55.1 years). Twenty-four women (26 feet) and 20 men (24 feet) underwent a reconstructive limb salvage procedure for diabetic Charcot neuroarthropathy using a systematic surgical approach involving internal and external fixation. A retrospective analysis of patient satisfaction and clinical outcome was evaluated over a 2- to 5-year postoperative period; 75% of patients completed the SF-36 health survey and a patient satisfaction survey. A reliability analysis found the SF-36 survey to be an adequate health measurement tool in this Charcot neuroarthropathy cohort. Analysis of variance and categorical data analysis showed that the patients improved statistically significantly in response to surgical intervention; however, none of the demographic variables was statistically significantly associated with patient outcomes as measured by the SF-36 and the patient satisfaction survey.

LEVEL OF CLINICAL EVIDENCE: 2.
MY UPCOMING CASE MONDAY – TIME IS OF THE ESSENCE

- 62 y/o
- DB x 12 yrs
- Hx of wound on and off 3 yrs, OM s/p ray resection
- 8.7 A1C
MY UPCOMING CASE MONDAY – TIME IS OF THE ESSENCE

April 2019

July 2019
SURGICAL AIM

- Create correct alignment of the foot and ankle
- Mobilization of the patient
- Decreasing ulceration risk
- Allow healing of existing ulcers to avoid amputation
SO WHO WON THE BATTLE?

- Patient dependent
  - Non compliance, A1c, age, weight, comorbidities
  - In truth, I will not operate on a stable charcot of the MF
  - Radiographic Parameters (Wukich, Hobizal, 2014)

- Unstable deformity must be stabilized
  - Surgery is sometimes inevitable, especially in Ankle charcot

- Despite modern techniques and improved fixation methods, 9% of patients with charcot deformities who undergo surgery will require amputation (DeVries, 2012)
  - Still learning about the biology of charcot type bone
  - High failure rate of femoral head undergoing resorption
QUESTIONS?
REFERENCES

- Brodsky JW, Rouse AM. Exostectomy for symptomatic bony prominences in diabetic Charcot feet.