Postoperative Care in Charcot Reconstruction:

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Disclosures

Nothing to disclose
In Conclusion…

“For several weeks you will not be putting any weight on that foot, okay?...”
The patient

- 55 yo WF
- DM with neuropathy
- Obesity
- Fibromyalgia
- Rheumatoid arthritis
- Depression/Anxiety
- “3 week swelling”
- Pain
- “No injury”
- No similar hx, change activity, shoe
- Bs 200-300s, A1c 11
- Gastric bypass
- Cholecystectomy
- Thumb surgery
The patient

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Complications
- Uncontrolled DM
- Severe equinus
- Non-adherence NWB
- Fall 1mo postop
- Incision dehiscence
- Infected hardware
- Osteomyelitis
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Postoperative therapies
- PCP
- TAL
- PT, DME
- Aggressive LWC, VAC, HH
- Bone stimulator
- ID, HW removal, Bone bx/cx
- IV abx, LTAC, Medical management
- Xray, MRI, CT, Lab
- CPed
She says…

“Dr. Wilson…”
Who...is at risk of FAILURE?

- Diabetes* (1% s vs. 29% c DPN)
- Cardiac/vascular* disease
- End-stage renal disease
- Morbid obesity
- Venous insufficiency
- Malnutrition
- Tobacco use
- Psychological disorder
- Ulceration/Infection
- Neuropathic**
What...should we consider?

- Pathology
- Equinus
- Ulcerations/Wounds
- Incision placement
- Fixation
- Grafts/Orthobiologics
- Bone stimulator
- Pharmacologic agents
- Contralateral neglect
When…does it begin?

• Preop
• Surgeon and patient decide **if surgery is best**
  • Decreased energy expenditure
  • Amputee survival rate at 3 and 5 years
  • Amputation: social change, give up home, lifestyle change, etc.
  • Salvage: independence and quality-of-life
• Cost** can approximate BKA
  • multiple return visits(multidisciplinary), hospital/OR, casting, physical therapy, long-term bracing, etc.
• Patient and family* should clearly understand intensity and burden prior to surgery
• Goals must be REALISTIC
  • Osseous stability
  • Plantigrade foot
  • Ulcer and amputation prevention
Where...does it begin?

- Variance exists
- Optimization
- Establish multidisciplinary team
  - DM
  - CKD
  - CVS
  - Malnutrition
  - Vitamin D
  - Tobacco (4 wk)
  - Psych
- Bone stimulators
- Pharmacologic therapy
  - Bisphosphonates
  - Calcitonin
- Physical therapy
- Charcot Stage

Limb Salvage

- Psychologist
- Podiatric Surgeon
- Dietitian
- Cardiovascular
- Physical Therapist
- Case Manager/Social Worker
- Nephrologist
- Primary Provider/Endocrinologist
- Pedorthotist
- Wound Care
- Infectious Disease
Why...does it matter?

• Poor skin/wound healing
• Wire/pin tract infection
• Hardware failure
• Soft tissue infection (superficial/deep)
• Osteomyelitis
• Sepsis
• Nonunion/malunion
• Recurrent Charcot
• Iatrogenic stress/bone fracture
• Increased morbidity and mortality rate
How...do we increase success?

- Hospitalization: 3-5 days
  - Pain management
  - Antibiotic therapy
  - Edema control
  - Medical management
  - Vascular checks
  - DVT prophylaxis POD #1
  - Drain management
  - Respiratory therapy
  - Physical therapy (DMEs)
  - Dressing change
  - Case management/Social work
    - LTAC/SNF
    - Rehabilitation
    - Home health
    - Wound Care Center
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- Must minimize motion
  - Edema management
  - DVT prophylaxis

- NWB
- PT
- DMEs
- TCC
- Charcot boot
- Rehab
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- Non-enzymatic collagen glycation
- Increased plantar pressures
- Achilles lengthening
- Gastrocnemius recession
- PT
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- Must reduce infection risk
- Residual ulceration
- Dehiscence
- Diabetics increase risk with EF
- Physician-directed pin care [1]
- WCC
- HH

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- Donor site morbidity*
- Pain*
- Reaction
- Failure
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- Implantable
  - Infection
  - Repeat surgery
- External
  - Adherence
- Cost
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- Calcitonin
  “In conclusion, this study suggests that intranasal calcitonin treatment of acute CNO, including patients with renal insufficiency, could be an effective modality to prevent bone resorption and progression of this condition, although larger clinical trials are needed to assess the role of calcitonin in patients with acute CNO.” [3]

- Bisphosphonates
  “There is, therefore, currently little evidence to support the use of BPPs as part of the routine management of patients with diabetes complicated by acute CNO. This is in agreement with the ADA consensus report that suggests that off-loading and immobilisation remain the mainstay of treatment.” [1]
  “The bisphosphonate, pamidronate, given as a single dose leads to a reduction in bone turnover, symptoms and disease activity in diabetic patients with active Charcot neuroarthropathy.” [2]

- Vitamin D
  “We demonstrated that peripheral BMD decreases as time from CN elapses. We also showed that gender, age, and serum vitamin D levels have various effects on BMD in diabetic patients with CN. As a result, patients with stage III CN have a great propensity for hardware failure, loss of correction, delayed union, and nonunion, complications we believe are associated with low BMD. To avoid such undesirable outcomes, utilization of locking plates or intramedullary nails can be considered.” [5]

- NSAIDs

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- Contralateral fracture (80%)
Analysis & Discussion

No previous study has longitudinally review patients with Charcot reconstructions of the midfoot. Study information suggests that the 20 year life expectancy amongst Charcot patients is near 70%, with a 5 year survival rate at 30%. These estimates are consistent with previous studies that place similar estimates at 40%. It should be noted that mortality rates amongst this population is often closely associated with multiple co-morbidities. In addition to mortality estimates we collected information regarding reoccurrence, hardware failure and amputation risk as well as ability to return to meaningful activity. Risk of overall amputation increased over time however the survivability rates within the 20-year cohort average 13.3 ± 3.1. This limb salvage rate is higher and longer than any previous reports. Patients who underwent limb loss were then isolated to a subgroup to find associated risk factors to limb loss. Patient’s return to meaningful activity has shown a rise in the last 10-15 years at nearly 25%. The maintenance of meaningful activity appears associated with reduction in re-ulceration, further amputation and reduction in hardware failure. Further hazard regression models should be applied to find the greatest risk to long-term limb salvage. Evidence from this study suggests that Charcot reconstruction can be a durable procedure with fair long-term limb salvage potential.
“The diabetic Charcot foot is a malady that demands the utmost patience on the part of the clinician and compliance from the patient. **Before** surgical reconstruction is attempted, metabolic control of hyperglycemia and vascular perfusion must be present while conservative care is exhausted. The patient’s age, activity level, and lifestyle must be considered when contemplating complex reconstruction versus simple exostectomy. When complex reconstruction is warranted, bone grafting and internal fixation play invaluable roles in maintaining structural integrity, preventing shortening, and above all, providing a stable, functional plantigrade foot. Additionally, both the surgeon and the patient must be prepared for an often long and debilitating postoperative course; for it is particularly evident that for these patients, the *4- to 6- week fusion rule does not apply*. It must be fully understood that reconstructive surgery of the Charcot foot is not without complications and must be thoroughly discussed with the patient prior to intervention. With this in mind, the physician and patient must carefully weigh the risks and benefits of surgery. Yet if performed properly, and with proper candidate selection and timing, the benefits may be extremely rewarding. Alternatively, surgical misjudgment and/or poor postoperative follow-up or compliance may prove to be disastrous.” [1]

Summary

• Challenging patient
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• Caution
Summary

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    - Begins preoperatively
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      - No “heros” needed
Summary

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      - No “heros” needed
        - Multidisciplinary approach
Summary

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  • Caution
    • Begins preoperatively
      • No “heros” needed
        • Multidisciplinary approach
          • Prevent the perfect storm
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          • Prevent the perfect storm
            • Remember the goal
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- Challenging patient
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    - No “heros” needed
      - Multidisciplinary approach
        - Prevent the perfect storm
        - Remember the goal
          - Minimize the risk
Thank You
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