Surgical Approach to Charcot

Less is Best

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Disclosures

No relevant disclosures related to this presentation
Current Concepts

LaFontaine, J et al. Current Concepts of Charcot Foot in Diabetic Patients
The Foot 26 (2016) 7-14

• Outcomes from studies in the 1980’s and 1990’s were mixed
  • Different stages of CN
  • Different methods of fixation
  • CN of different anatomic locations
  • Inclusion of patients with and without ulcerations
• Definition of success
  • Radiographic healing
  • Return to ambulation

Indications for Surgery
• Pain
• Instability
• Deformities that cannot be treated effectively with bracing
• Inability to heal an ulcer
• Recurrent ulceration
• Infection
Surgery is technically very demanding
Fixation fails
Complications include:
• Pseudoarthrosis
• Wound problems
• Infection
• Amputation

Appropriateness of reconstructive surgery during the acute phase is still a matter of debate

Plantar exostectomies in combination with Achilles tendon lengthening to remove bony prominences associated may be indicated for recurrent ulcers and high plantar foot pressures

Complex reconstructive procedures with arthrodeses are more frequently reserved for realignment and stabilization of severely deformed feet or ankles in an effort to avoid amputation

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Operative versus Non-operative Care

- 198 patients (201 feet) with Charcot Arthropathy
- University based Ortho Foot & Ankle Clinic with special interest in diabetic foot plantigrade vs non-plantigrade feet

- Location
  - 147 midfoot
  - 50 ankle
  - 4 forefoot

- 6 year follow-up
- Endpoint was use of depth inlay shoes with custom inlay without complication
- 87/147 midfoot cases (59.2%) had plantigrade foot without surgery

*More than half of patients with midfoot CN can successfully be managed without surgery.*
Exostectomy


Relieve pressure in areas ulcerated or at risk for ulceration
Rigid, rocker bottom midfoot deformities

Retrospective review of patients who underwent ostectomy for chronic or recurrent midfoot ulcerations secondary to CN
27 procedures in 20 patients
18 medial / 9 lateral ulcers
20/27 (74%) healed

6/7 non healed cases involved lateral ulcers
Ostectomy is a reasonable option for medial midfoot ulcers that fail to heal with non-operative therapy.
Systematic Review of the Literature

In 2012, Lowery et al published a systematic review of literature from 1960-2009 yielding 897 procedures – 59% midfoot

- Review of studies published 2009 – 2014
- 30 articles
- 860 patients undergone surgical procedure for treatment of CN
- Surgical Procedures
  - Amputation
  - Arthrodesis
  - Debridements / drainage of infections
  - Exostectomy
- Overall amputation rate 8.9%

Location
- Midfoot 26.9%
- Hindfoot 41.6%
- Ankle 38.4%

Trend to treat midfoot CN non-operatively

Surgery may be indicated in patients with instability, pain, or recurrent ulceration that fail non-operative management

Quality of evidence improving

Timing and fixation methods remain inconclusive

Case Example
Recurrence

- 13 feet (23%) in 12 patients
- Mean time to recurrence 27 months
  - 7/13 same area
  - 4/13 adjacent areas
  - 2/13 different area
- Shorter immobilization time
  - 3 vs 5 months
- 12/13 had advanced stage at diagnosis
- 9/13 noncompliance
  - 69% vs 10%
- BMI >30 had 6.4 odds ratio to experience recurrence

Potential Factors Influencing Recurrence

- Duration of immobilization
- Obesity (insufficient offloading)
- Stage of disease at first diagnosis
- Noncompliance (refusal of TCC)

Recurrence occurs because CN not in remission
Exostectomy Versus Reconstruction


- Forty percent of patients with Charcot midfoot disease who had been managed primarily with conservative care may require surgery
- Patients who have recurrent chronic ulcerations with radiographic evidence of plantar prominences due to Charcot may be candidates for exostectomy of the osseous deformity
- Exostectomy of the bony plantar prominence is reserved for the more stable Charcot foot
- Patients who have an increased amount of instability as well as multiplanar deformities will respond more suitably to reconstruction
- Surgical reconstruction of the Charcot lower extremity does not have an acceptable treatment algorithm. Surgeons should tailor treatment to each individual patient and the deformity
Conclusion

- Late detection more likely to result in severe deformity which subsequently may lead to ulceration, infection, significant instability and amputation

- Wukich and colleagues reported in 2011 that Charcot neuropathic osteoarthropathy (Stage 0) was missed by 95% of providers prior to foot specialist referral

- In the presence of concomitant osteomyelitis, severe unstable deformity, or in patients with advanced co-morbidities, proximal amputation is a likely outcome

- Prevention and early detection
- Trend toward non-operative treatment for midfoot Charcot
- Exostectomy versus Reconstruction – wound recurrence / instability
- Complications associated with all surgical management – comorbid population
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