Salvage of diabetic foot Osteomyelitis with antibiotic impregnated cement spacer - Long term follow up

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- Long term follow up

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Disclosure:
The authors of this presentation have no conflict of interest with the context of this presentation
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The problem:
- When diabetic foot infection are present with osteomyelitis extensive eradication of the bone and soft tissue infection often involves partial foot amputation.
- An amputation leads to ulcer, infection and repeat amputation by way of overloading the remaining metatarsal heads and/or creating toes deformity.

The natural history of great toe amputations (1); (J Foot Ankle Surg. 1997)

60% repeat amputation within 10 months

Ulcer after 2nd Ray amputation

1 year post 1st Ray amputation

Hallux Valgus, leading to ulcer over the bunion, developed one year after lesser toe amputation
Hypothesis

- Cement Spacer with antibiotic can be used as an adjunct to adequate (extensive) surgical debridement for eradication of forefoot osteomyelitis in diabetic patients.

- The roll of the cement:
  - Deliver high concentration of local antibiotic
  - Support the soft tissue and fill the gap created by extensive debridement
Patients Data:

- 56 patients
- 67 Cases (sites or events of infection)
  - (14 men, 6 women)
- Average FU was 39.7 (± 30) months
  - (range 6-125 months)

**Antibiotic Cement spacer (ACS) technique:**
- PMMA premixed with Gentamycin
- Vancomycin was added routinely (1 gram added to one third of the co-polymer powder)
- Amikacin was added in selected cases (500 mg of amikacin)
**Results (Outcome):**

- **67 pts. Forefoot osteomyelitis**
  - **Salvage**
    - 50 sites (74.6%)
      - (in 45 pts.)
    - **Primary Healing**
      - 33 (~2/3)
    - **Secondary Healing**
      - 17 (~1/3)
  - **Failure e.g. Amputation**
    - 17 sites (25.3%)
      - In 12 patients

**Amputation Level**
- Toe – 4
- Ray – 2
- Transmetatarsal – 1
- Trans-tibial – 5

**Cement spacer:**
- Left in permanently – 23
- Removed + Arthrodesis – 12
- Removed - pseudoarthrosis – 15

* One patient had died shortly after the index surgery. Two patients recovered but subsequently underwent transtibial amputation (after 18 months and 5 years) due to infection in a different site.
33 y.o. failed prior surgeries, 6 weeks home IV Ab.
2.5 month later

Patient deceased 8 years later of Sudden MI. There has not been any further episodes of ulcers, infections or amputation.
a. Our First patient: Osteomyelitis of Hallux IPJ
b. Primary surgery – wide debridement and eradication of infected bone.  
c. One week post surgery: cement too bulky but infection calmed down.  
d. 2\textsuperscript{nd} surgery – cement removal and IPJ Fusion.  
e. 3 years. FU – practically Normal foot (the patient is now > 10 years FU, and is stable)
The “reinforced concrete” concept:
A. Extensive infection and osteomyelitis involving the medial ray. B. Comprehensive debridement leaving huge gap. C. Multiple KW’s are inserted first to stabilize the 1st ray. D. Cement with antibiotic has been shaped in the gap around the wires. E. the foot at the end of surgery. F. X-rays at 6 weeks PO, before the wires are removed. G. the foot at 3 month. No ulcer with orthotics. H. The cement remains in place. Notice the tunnels created by the wires. The picture is at 3 months, but the patient is now 6 years with no ulcer recurrence.
The Cement Spacer Concept

- Aggressive debridement - wide resection
- Proper size and shape Cement Spacer
- Stability – “reinforced concrete”
  Multiple KW’s embedded within the cement
- Broad spectrum antibiotic, high local concentration
- Foot functionality planning

Authors’ comment: in a previous publication of intermediate term follow up we reported a 90% success rate in our first 20 patients (3). The dropdown to 75% probably emanates from expansion of the indication for usage of this method to more complicated cases. In addition, as this method has become a routine in our institution we have had our residents perform this surgery and not only the foot and ankle senior surgeons.
