Limb Salvage After Surgical Wound Dehiscence and Septic Joint from a Routine Distal Fibula Fracture: A Case Study

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STATEMENT OF PURPOSE

The treatment of complicated ankle fractures with septic joint, full thickness ulcerations with no soft tissue coverage are life changing for those unfortunate to suffer these problems. Time is tissue in these situations. This case study presents ankle reconstruction after a patient obtained an infection from an anterolateral/transverse incision for a distal fibula fracture repair performed in Haiti. Case demonstrates the importance of early and aggressive debridement and use of intravenous antibiotics are paramount for success. With the advanced biologics continuing to develop our potential for success will continue to grow in limb salvage.

LITERATURE REVIEW

Septic arthritis (aka septic joint) is a true rheumatologic emergency that may lead to disability or death. Prompt evacuation of the joint, either by arthrocentesis at the bedside, open or arthroscopic drainage in the operating room, or imaging-guided drainage in the radiology suite is mandatory. Antibiotic courses of 3 to 4 weeks in duration are usually adequate for uncomplicated bacterial arthritis. Treatment duration should be extended to 6 weeks if there is imaging evidence of accompanying osteomyelitis.(2) Two main mechanisms of prosthetic joint infection is either the implant was contaminated or inoculated at time of implantation, and/or hematogenous spread. (3) It is important to keep all these mechanisms in mind when faced with these infections. Diagnosis needs to be prompt and this can be aided with use of laboratory, radiological, physical exam, and the history. (1)

CASE STUDY

HISTORY:

1/14/16 Bethesda East ED: Pt sent in to Bethesda East ED by Physician for a Podiatry evaluation after being seen in office that afternoon. Pt is a 54-year-old, creole-speaking female who on 1/2/16 fractured her left ankle in Haiti after a car rolled over her left leg. Pt had left ankle ORIF in Haiti at that time.
Past Medical History: Hypertension and Diabetes (Blood sugar "typically 100 to 150")
Past Surgical History: Left Ankle ORIF
Social History: Denies tobacco, EtOH, and drug use
Family History : Unknown

CASE STUDY CONTINUED

VITALS/LABS
Vitals: T: 99.4, HR: 91, RR: 16, BP: 129/96
Labs: WBC: 12.6, Hb: 12.2, Hct: 37.5, Plt: 717
Na: 134, K: 4.6, Cl: 95, CO2: 27, BUN: 21, Cr: 1.06 Glucose: 218

LOWER EXTREMITY PHYSICAL EXAM:

Vascular – DP & PT pulses palpable b/l. CFT intact to digits 1-5 b/l. LLE edema noted. LLE warm to hot from proximal to distal
Dermatological – Inverted L type incision at anterior L ankle. Necrotic tissue distal to incision. Heavy purulent drainage upon palpation. Significant malodor. Positive Probe to bone throughout incision site
Musculoskeletal - Severe pain upon palpation of L ankle. Pain with PROM L ankle. AROM diminished in Left ankle
Neurological – Light touch absent at distribution of Superficial Peroneal nerve, other sensation intact.
Radiological – Hardware for distal fracture. No soft tissue emphysema present. No osteolysis. Soft tissue edema noted.

TREATMENT/ADMISSION

1/14/16 Surgery 1: Emergent Debridement with Irrigation Extensive soft tissue debridement with Pulse lavage 6 L NSS with Polymyxin and Bacitracin. Xeroform applied to all exposed neurovascular structures and tendons followed by NSS and 4x4 wet to dry, DSD and Posterior splint. Vancomycin given in ED Intraoperative Wound Culture 1/14/16 demonstrated: Pseudomonas aeruginosa, Clostridium species (not perfringens), and Also mixed gram positive and gram negative flora. No fungal elements or AFB seen. At this point pt placed on Zosyn by Infectious Disease. 1/19/16 Surgery 2: Hardware removal (Fibular plate) with thorough irrigation. Excisional debridement of wound to muscle and bone (13x14cm). Fibular fixation performed by intramedullary wire. External fixator application (Circular fixator – 2 rings and foot plate) Biological graft application consisting of a bovine monolayer placed below tendons to cover ankle joint, bovine monolayer placed over the tendons, and a bovine bilayer fenestrated and applied with skin staples completely covering the wound. Wound Vac applied 125mmHg, Continuous, Low intensity. Intraoperative Wound Culture 1/19/16 demonstrated Enterobacter cloacae complex and Enterococcus species. No fungal elements or AFB seen. Infectious Disease continued with Zosyn IV.

IMAGE 1

IMAGE 2

CASE STUDY CONTINUED

2/2/16 Ptreturns to Hospital. Pt was discharged on 1/28/16. Unfortunately HHC had difficulty applying wound VAC, so sent patient to ED. Pt relates felt feverish night before. Vitals T: 98, HR: 57, RR: 18, BP: 113/74 Labs: WBC: 4.2, Hb:11.0, Hct: 34.8, Plt: 317 BUN: 12, Cr: 1.07, Glucose: 106
2/3/2016 Surgery 3: Excisional debridement of wound down to bone including tendon, Left ankle. App of Skin substitute over ulcer to anterior ankle with cryopreserved placental membrane graft. App of biologics over ulcer to anterior ankle with Bovine monolayer graft. App of skin substitute over ulcer to anterior ankle with bovine bilayer graft. App of wound Vac, Left ankle. Infectious Disease resumed Zosyn IV. Resumed the Zosyn for 3 more weeks with ID guidance.
4/11/16 Surgery 4: Preparation of wound bed to the anterior aspect of LLE . Harvest of graft L thigh. Application of STSG LLE wound Kept the External fixator intact.
5/13/16 surgery 5: External Fixator Removal. 17 Weeks since Initial debridement 1/14/16, Patient seen twice a week in office for wound Vac and Dressing changes. At this time it has been one month since STSG application. Placed into a Jones compression and Posterior splint.
Post-op course was uneventful. Post-op visit 5/17/16 placed patient in CAM walker boot weight-bearing with a walker
Started Physical Therapy immediately after first post op visit for ROM, Strengthening exercises, and to prevent any further disuse osteopenia. On 6/17/16 casted patient for AFO. On 7/12/16 pt placed into AFO with hinge and Dorsi-flexion assist and utilizing a cane for ambulation. At 18 month follow up pt is ambulating with the AFO and utilizing a cane for balance. Pt continues to have numbness on the dorsolateral foot, but does not have pain. Pt considers it an excellent outcome considering the situation.

ANALYSIS & DISCUSSION

In Post traumatic foot and ankle surgery the diagnosis can be difficult and require the use of combined laboratory values, radiological findings, physical exam and history to make the diagnosis. (1) This can be the difference in the loss of limb or life depending on the severity of the infection. Permanent disability is a potential outcome of these serious infections once they occur.

ANALYSIS & DISCUSSION

Earlier the diagnosis the greater the odds of limb salvage. Treatment must have effective antibiotic therapy and adequate debridement of the infected tissue. These cases can take multiple stages with temporary external fixation to achieve the goal of a pain free and functional limb. (1)This case study reiterates the importance of early surgical debridement of infected joint followed by advanced wound care modalities and infectious disease consult to produce the most favorable outcome. The goal of our treatment was to stabilize the fracture, control the infection, provide coverage of exposed anatomy, and restore the function of the ankle joint. This case study reinforces time is tissue also in these aggressive infection cases.

IMAGE 3

REFERENCES

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