Dehydrated Human Amnion/Chorion Allograft* Supports Limb Salvage Treatment of Infected First Metatarsophalangeal Joint Implant with Osteomyelitis

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INTRODUCTION

Management of infection of the first metatarsophalangeal joint (MTPJ) implants with associated osteomyelitis is challenging, especially in the presence of deep extending ulcerations. Treatment options include primary amputation versus various techniques for limb salvage. However, salvage attempts can necessitate extended periods of wound care management requiring multiple debridement and skin substitute applications, thereby risking repeated infections and potentially increasing medical costs. We examine the role of a single application of dehydrated human amnion/chorion allograft (dHACA) for limb salvage of an infected first MTPJ implant with associated osteomyelitis and deep extending ulceration.

METHODS

A 65 year old female presented with an open, infected wound on the plantar aspect of her right first MTPJ (greater than a month in duration). She had a history of a first MTPJ implantation a month prior which subsequently became infected. Acute osteomyelitis of the first MTPJ was confirmed. Initial surgical treatment included incision and drainage with extensive debridement to excise all necrotic, nonviable tissue, removing the infected implant application of an uniplanar external fixator with an absorbable antibiotic spacer, and application of dHACA for management of the plantar first MTPJ ulceration. Once the infection cleared and the wound resolved, secondary surgical treatment included a first MTPJ arthrodesis with osseous allograft.

RESULTS

Full wound closure was achieved in 5 weeks after a single application of dHACA at initial surgery. No recurrence has been noted for 2 years since closure.

DISCUSSION

There is overall no clear consensus for management of infected first MTPJ implants with associated osteomyelitis and deep extending wounds. Salvage attempts usually require extended wound care and multiple repeated treatments, which may place risk for repeat infections, and can be medically costly. dHACA may be an effective modality to assist wound closure in the management of these complex limb salvage cases.

***AmnioBand® Membrane (MTF Biologics, Edison, NJ)**

CASE INFORMATION

Patient Information:

- 65 year old female presents to ED for plantar forefoot wound greater than 1 month in duration
- Attests to localize cellulitis that had failed outpatient antibiotic regimen.
- Medical history: Hypothyroidism, DMII (newly diagnosed)
- Surgical history: R bunion surgery, revision to right first metatarsophalangeal joint implant
- Social history: Neg tobacco/ETOH
- Allergies: Oxycodone
- Medications: Lecothyroxine, losartan

Initial Examination/Wound History:

- On physical examination, patient was identified to be neuropathic, likely associated with newly diagnosed DMII.
- Wound probed directly to underlying silicone first metatarsophalangeal joint implant (as visualized on radiographs).
- Technetium 99m Bone scan performed, demonstrated increased delayed uptake at level of first metatarsophalangeal joint consistent with acute osteomyelitis of the wound site.
- Patient admitted to the hospital, started on IV antibiotics, infectious disease team consulted.

Treatment:

- Given acute osteomyelitis and infected implant, original consulting podiatrist had recommended primary partial first ray amputation. Patient was overall unagreeable, so was sent for a second opinion for possible reconstructive salvage treatment.
- Treatment Plan:
  - Implant extraction/margin resection/antibiotic spacer
  - Monorail for length/joint immobilization
  - dHACA to wound bed
  - Plan for secondary arthrodesis based on: Clean margins and wound resolution

Outcome:

- Closure of wound was achieved in 5 weeks with no further subsequent skin substitute applications.
- Given closure of wound and clean bone margins with no residual acute osteomyelitis, plan for secondary arthrodesis utilizing MTF osseous allograft.
- Approximately 1 week after conversion to secondary arthrodesis, 8 weeks after initial DOS on 1/21/2021, there was continued closed wound with no recurrence of ulceration.

Radiograph showing that wound probed directly to underlying silicone first metatarsal joint implant

Initial Wound

Day 0: 1/21/2021

Day 7: 1/28/2021

Day 17: 2/7/2021

Day 24: 2/14/2021

Day 31: 2/21/2021

5 Weeks: 2/28/2021 - Wound closed

Transition to secondary staged arthrodesis

1 Week after conversion to secondary arthrodesis

1.5 years later: 7/29/2022: Follow up—Wound remained closed; no recurrence