65 Years After a Shrapnel Injury in a Korean War Veteran

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Purpose

- The purpose of this study is to demonstrate that a Delayed Foreign Body Granuloma (DFBG) can occur decades after initial injury and examine the use of Placental Connective Tissue Matrix Allograft (AmnioFill®) in a dehisced surgical wound with a sizeable defect after the excision of a DFBG secondary to shrapnel.

Background

Delayed Foreign Body Granulomas (DFBGs)

- A foreign body granuloma is an inflammatory, histolytic and macrophage reaction pattern that occurs in response to exogenous material that penetrates the dermis.[1] Histologically, these lesions are characterized by a predominantly multinucleated giant cell infiltrate that also contains histiocytes, lymphocytes and other inflammatory cells.[1] This acute inflammatory immune response is often self-resolving. However, a retained foreign body, can lay dormant for weeks, months, or years before a granulomatous reaction can occur and ultimately lead to the development of a DFBG.
- With the prevalence of improvised explosive devices, shrapnel wounds are not unheard of in active duty military personnel.[2,3] Even years after the initial injury, shrapnel can result in DFBGs in veterans.
- Plain radiographs are necessary to rule out most foreign bodies, but ultrasound can also be utilized.[4] Common foreign bodies, especially in diabetic and other neuropathic patients, include metallic materials, thorns, glass, and ceramics.[5,6] The treatment of a foreign body granuloma is most often by way of surgical excision.[7,8]

Placental Connective Tissue Matrix Allograft (AmnioFill®)

- AmnioFill is composed of human placental connective tissue matrix.[9] As a minimally manipulated, non-viable cellular tissue matrix allograft, AmnioFill contains growth factors, cytokines, and extracellular matrix proteins to enhance wound healing.[9] These growth factors also decrease inflammation and potential scarring of the wound.[9] Due to its multipurpose form, it can be used in acute and chronic wounds.[9]

References

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Case History

- An 85 year old White Male, with a history of shrapnel injury 65 years ago during the Korean War, Type 2 diabetes mellitus, B-12 deficiency, peripheral neuropathy, anemia, chronic kidney disease stage 3A, and dementia, presented to the Podiatry Clinic complaining of left foot erythema (Figure 1).
- The patient and family denied recent trauma. Prior to referral to Podiatry, his PCP prescribed 2 weeks of oral antibiotics.
- It was clinically evident that the patient had a soft tissue mass. X-rays revealed a large piece of shrapnel in the left dorsolateral forefoot that appeared to be centrally localized within the soft tissue mass (Figure 2).
- The patient and family consented for surgical excision. The soft tissue mass, which measured 3.0cm x 2.5cm x 1.5cm and weighed 4.2 grams, was excised (Figure 3), leaving a sizeable defect, but immediate closure with 4-0 Nylon suture was able to be performed.
- Immediate post-op x-rays were repeated (Figure 4). The pathology report confirmed an "extensive foreign body giant cell reaction."
- One week s/p the excision of the DFBG, the surgical site dehisced.
- AmnioFill, a new biologic, was selected for this patient's dehisced wound. Following debridement, the wound was packed with AmnioFill mixed with normal saline (Figure 5) every 1 to 2 weeks. After each AmnioFill application, the wound was covered with Mepitel®, Steri-Strips™, and 4x4 gauze and wrapped with Kerlix.

Results

- The initial dehisced wound measured 2.0cm x 1.9cm x 2.0cm (Figure 6).
- The patient underwent 5 AmnioFill applications over the course of 7 weeks (Figures 7-10).
- The wound was superficial at 9 weeks post-operative and wound care was changed to daily applications of antibiotic ointment with a Band-Aid.
- The patient's wound closed prior to his 3 month follow-up (Figure 11).

Conclusions

- Pathology confirmed our diagnosis of a DFBG.
- Although rare, a DFBG can occur decades after the initial injury. This 65 year DFBG would be the oldest ever to be documented.
- AmnioFill is an excellent biologic to have in the podiatric wound care arsenal.

Case Photos

Figure 1: Initial evaluation

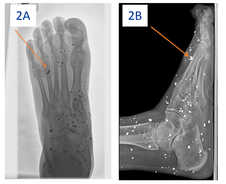

Figure 2A: AP plain film radiograph
2B: Lateral plain film radiograph

Figure 3: Extensive foreign body giant cell reaction

Figure 4A: MO plain film post-op
4B: Lateral plain film post-op

Figure 5: Left: AmnioFill
Right: Mixed with normal saline

Figure 6: Post-op dehiscence, 1st post-op week

Figure 7: 1 week post-op with AmnioFill application

Figure 8: 3 weeks post-operative

Figure 9: 5 weeks post-operative

Figure 10: 7 weeks post-operative

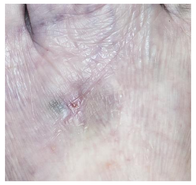

Figure 11: 12 weeks post-operative

Healed at 12 weeks with 5 applications of AmnioFill allograft

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