Treatment of Traumatic Degloving Injury of the Foot Using Biologic Dressing in a Pediatric Patient

Richard Kaufman DPM1, Brett Wills DAM2, Sunny Patel DAM3, Ramon Lopez DPM4, Steven Boc DPM5, FACFAS, FACFAS, FACFAS

1PGY3 Podiatric Surgery Resident, Hahnemann University Hospital / DUCOM, Philadelphia, PA
2PGY3 Podiatric Surgery Resident, Hahnemann University Hospital / DUCOM, Philadelphia, PA
3PGY3 Podiatric Surgery Resident, Hahnemann University Hospital / DUCOM, Philadelphia, PA
4Attending Podiatric Surgeon, Hahnemann University Hospital / DUCOM, Philadelphia PA
5Attending Podiatric Surgeon and Director of Podiatric Surgery Residency Program, Hahnemann University Hospital / DUCOM, Philadelphia PA

Purpose and literature review

Degloving injuries of the foot involve the management of extensive soft tissue and osseous damage secondary to significant loss of soft tissue. This presents a major challenge to the surgeon from the beginning of treatment. If injury involves osseous exposure, early coverage of the defect must be a primary goal in order to prevent devastating complications such as osteomyelitis and severe soft tissue infection (1). Contamination of the wound with debris alongside severe adipose readling can make early definitive wound closure impossible and require a multi-stage approach in order to provide optimal functional outcome and return to previous activity (2). In the pediatric patient, meticulous surgical technique and return to functional outcome is of the utmost importance.

In the limited amount of literature available on pediatric foot degloving injuries, surgical procedures are applied in plastic surgery techniques such as split-thickness skin grafts, rotational flaps, and other procedures, which have the potential to leave additional surgical scarring on the patient, can promote post-operative infections, and can lead to severe physiological issues such as infection and necrosis (2). Furthermore, the psychological impact of an additional site of hypertrophic scarring may be subject to excessive ridicule amongst class mates and additional psychosocial complications (3). In cases in which tendon or bone are exposed in addition to defatted and degloved soft tissue, requires a multistage approach often followed by a plastic surgical procedure. Primary repair is often accomplished whenever feasible, however, if the patient is not healthy, young, and compliant patient, additional plastic surgery techniques, which present with potential physiological complications such as infection, graft failure, and poor cosmesis are not always necessary to provide adequate healing and orthopedic function.

Case Study

The patient presented to the Hahnemann University Hospital Emergency Department with a severe Gustilo Anderson IIIa degloving injury to her medial right foot secondary to a motor vehicle accident in which her bare right foot was stuck under the passenger seat of the car (Figure 1a). The pediatric surgery department was consulted within 30 minutes of the accident. Upon physical examination, there was significant debris contaminating the soft tissue. open and exposed flexor and extensor, and significant exposure of osseous structures. Within the hour, the patient was brought to the operating room, where the wound was copiously irrigated and debrided to remove all debris and non-viable tissue. The primary closed primary closure was applied to the wound. Patient underwent 72 hours of antibiotic therapy prior to surgery.

One week later, the patient was taken to the OR a second time for further debridement, primary repair of muscle (abductor hallucis and extensor digitorum brevis), application of Integra® Dermal Regeneration template, application of NPWT and bone biopsy of Navicular. Dermal Regeneration (Integra®), application of NPWT and bone biopsy of Navicular. The patient was taken back to the OR the second time for further debridement overlaid with Integra®. When the patient returned for her final follow-up, the foot was able to fully epithelialize without complications. The patient related no interference of her day to day activity. As previously stated, our patient had complete return to function at the seven month follow up appointment, the patient related no interference of her day to day activity.

Discussion

Degloving injuries, which often present themselves as grossly contaminated wounds with extensive soft tissue defects, require a multistage approach often followed by a plastic surgical procedure in order to provide optimal healing and function. Furthermore, if injury involves osseous exposure, early coverage of the defect must be a primary goal in order to prevent devastating complications such as osteomyelitis and severe soft tissue infection (1). Contamination of the wound with debris alongside severe adipose readling can make early definitive wound closure impossible and require a multi-stage approach in order to provide optimal functional outcome and return to previous activity (2). In the pediatric patient, meticulous surgical technique and return to functional outcome is of the utmost importance.

References


