BACKGROUND

- The care of the pediatric patient with traumatic injury to the lower extremities necessitating skin grafting can be a challenging issue for the Pediatric surgical and trauma teams.
- Initially these injuries may appear to be minor, but over time infection, hematoma, &/or reperfusion injury leading to extremity compartment syndrome may develop resulting in soft tissue loss.
- Care of the patient with lower extremity traumatic injury resulting in soft tissue loss may require prolonged wound care & possible reconstruction with skin grafting & lengthy hospitalization & rehabilitation.
- A split thickness skin graft (STSG) involves grafting skin from a healthy donor site on the patient, usually lateral thigh or buttock, and grafting the donor skin to the involved area of tissue loss.

OBJECTIVES

- Discuss mechanism of injury & surgical management of the pediatric patient with traumatic lower extremity injuries.
- Describe the short & long term care of skin graft site & donor sites.

DERMATOME

SPLIT THICKNESS SKIN GRAFT

Split thickness skin graft involves removing the epidermis & a portion of the dermis from a donor site using a dermatome. This donor graft is meshed to allow fluid to flow from the tissue bed & to spread the graft over a larger surface area of the wound. The donor graft is placed on the wound bed & secured with staples. Adaptic is applied & a Wound VAC is placed over the graft site to promote wound healing, vascularization of donor graft & donor graft adherence. The donor site is covered with Aquacel & tegaderm.

CASE REVIEWS

- **BD, 17 year old male:** Blunt injury to left thigh while playing football. Initially presented to OSH ED for hematoma on TDI#2. Transferred to MCH on TDI#27.
  **WORKUP & DIAGNOSIS:** TDI#2: Diagnosed with compartment syndrome of the LLE.
  **SURGICAL MANAGEMENT:** TDI#2: Emergent fasciectomy & debridement of necrotic tissue, Wound VAC placed. TDI#27: Preparation of split-thickness skin graft from right thigh less than 100 sq cm, placement of a split-thickness skin graft onto left thigh.
  **POST OP CARE/OOUTCOME:** Discharged home with home nursing & Wound VAC changes. Unable to have skin grafting done at OSH due to insurance issues. MCH post op care: Wound VAC x 1 week. Graft site with near 100% take. QD dressing changes with Adaptic, Kerlix, ACE wrap. Donor site care AQuacel & tegaderm.

- **CD, 7 year old male:** Injury to RLE while on skateboard, a car backed over him. Transferred to MCH on TDI#12 with necrotic wound of right medial thigh.
  **WORKUP & DIAGNOSIS:** TDI#1: OSH ED: RLE x-rays negative, d/c home. TDI#4: ED: worsening right inner thigh ecchymosis & pain, dx with right femur contusion, d/c home. TDI#9: OSH ED: told “it’ll slough off”, d/c home. TDI#11: OSH ED: wound black eschar, no longer able to bear weight, purulent & bloody drainage noted, good LLE perfusion. TDI#12: transferred to MCH. Diagnosed with right upper thigh necrotic hematoma.
  **SURGICAL MANAGEMENT:** TDI#12: RLE excision of 12x12 cm eschar & evacuation of infected hematoma. TDI#14: Wound VAC placed. TDI#18: STSG right medial thigh, 11 x 12 cm, 132 sq cm, Wound VAC placed. TDI#23: VAC removed, donor site dressing changed.
  **POST OP CARE/OOUTCOME:** Once VAC removed, QD dressing changes with bacitracin to wound edges, petroleum gauze to graft site, wrapped in Kerlex & reinforced with ACE wrap. Donor site open to air. M/W/F dressing changes with home nursing.

- **DS, 12 year old female:** Injury to LLE after being hit by a car while riding her bicycle. Patient transferred to MCH on TDI#7 with increased swelling, bruising, pain & small amount of drainage from abrasion of LLE. WORKUP & DIAGNOSIS: Initial surgical evaluation at MCH: The area of skin abrasion over lateral aspect of the LLE dusky with frank gangrene. Diffuse LLE swelling below the knee, 8x6 cm area of skin necrosis. Diffuse surrounding bullae. Diagnosed with necrotizing fasciitis.
  **SURGICAL MANAGEMENT:** TDI#7: LLE debridement of necrotizing soft tissue infection, 10x17 cm. TDI#8: Dressing change under anesthesia. TDI#12: STSG, 330 sq cm from left thigh donor site. STSG to LLE wound, Wound VAC placed. TDI#17: Dressing change with sedation, Wound VAC removed, findings of LLE graft site: near 100% take of graft.
  **POST OP CARE/OOUTCOME:** QD dressing changes with Adaptic, ABD pads & Kerlix. Donor site open to air. Follow up with PT for ROM, strengthening & stretching to LLE due to weakness & decreased function.

IMPLICATIONS FOR SURGICAL NURSING

- Monitor for potential complications: infection, hematoma, seroma, graft adherence, contractures of wound
- Coordinate care for home nursing dressing changes or wound VAC changes
- Teach family and patient wound care and dressing changes for donor site and graft site
- Collaborate with Surgical and Trauma teams for care

CONCLUSIONS

- The management of pediatric lower extremity traumatic injuries requiring skin grafting presents challenges to the pediatric surgical and trauma teams. The pediatric surgery nurse practitioner collaborates with the pediatric surgery & trauma team to formulate management and care of complex wound grafts & donor site care.

REFERENCES

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