Wound Management
Objectives

- Differentiate between partial and full-thickness burns
- Describe the procedure for escharotomies
- Discuss management of patients with burns of special areas
Introduction

- ABCs First
- Ultimate outcome dependent upon healing of the burn wound
- Overall severity of multiple-system injury response is linked to wound extent
Anatomy of the Skin

Functions Crucial to Survival

- Protection from infection & injury
- Prevention of loss of body fluids
- Regulation of body temperature
- Sensory contact with environment

Epidermis

Dermis

Appendages

Subcutaneous
Pathophysiology

Cellular damage / tissue injury produced at temperatures above 44°C (111°F)
The higher the temperature of the heat source . . .

. . . the less time it takes to sustain a serious burn injury.

AND

The longer the time of exposure to a heat source, the deeper the tissue injury.
Zones of Injury

- Zone of Coagulation
- Zone of Stasis
- Zone of Hyperemia
Clinical Importance of depth determination

- Dictates necessary wound care
- Need for grafting
- Ultimate functional & cosmetic outcome
Injury Depth

1st Degree
Partial Thickness
2nd Degree
Full Thickness
3rd Degree

Epidermis
Dermis
Appendages
Subcutaneous
Partial Thickness: First Degree

- Epidermis only
- Pain & redness
- Heals in few days; outer injured epithelial cells peel
- Seldom clinically significant
Partial Thickness: Second Degree

- Entire epidermis & portion of dermis
- Pain, blisters, moist, capillary refill
- Uninjured dermis & epidermal appendages at risk
Partial Thickness: Second Degree

- Heals spontaneously in 2-3 weeks
- Skin graft may improve functional & cosmetic outcome
Full Thickness: Third Degree

- Entire thickness of epidermis & dermis
- Decreased pain, blisters, dry, absent capillary refill
Full Thickness: Third Degree

- Healing by contracture & epithelial ingrowth from edges, or
- Skin graft
Fluid Accumulation

- Early & rapid wound fluid accumulation
- Hypovolemic shock
Fluid Accumulation

- Edema formation
  - Impaired respiration
  - Impaired blood flow

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ABLS:Wound Management
Wound Care

Transfer within 24 hours post burn injury

- Cover with clean, dry sheets
- Protect from heal loss
  - Use thermal insulating blanket
  - Do not use wet dressings or sheets
Delayed Transfer

- Premedicate with analgesic
- Debride loose epidermis and blisters > 2cm
- Soap and warm water wash
Wound Care

Delayed transfer--Topical antimicrobial cream

♦ Silver sulfadiazine (SSD, Silvadene, Flamazine, etc.)
♦ Mafenide acetate (Sulfamylon)
♦ Gauze wrap
Escharotomies

- Rarely indicated prior to transfer
- May be required to permit normal ventilation and maintain peripheral perfusion
- Signs & symptoms indicating need for escharotomy or fasciotomy
  - Cyanosis of distal unburned skin on limb
  - Unrelenting deep tissue pain
  - Progressive numbness
  - Progressive decrease or absence of pulse
Chest Escharotomy

- Indicated to relieve respiratory distress due to restricted chest wall excursion

- Location
  - Anterior axillary line bilaterally
  - Extend to adjacent abdominal wall as needed
  - Connecting costal margin transverse incision
Indication

Deep second or third degree circumferential extremity burns that produce vascular compromise
Extremity Escharotomy

Interventions

- Remove all rings, watches, other jewelry
- Elevation & active motion
Signs and Symptoms of Vascular Compromise

Hourly evaluation

- Skin color: pallor, cyanosis
- Pain
- Progressive paresthesias
- Progressive loss of sensation / motor function
- Diminished capillary refill (perfusion)
- Decreased or loss of pulses
Extremity Escharotomy

Ultrasonic flowmeter to assess arterial blood flow

- **Upper extremity**
  - Radial, Ulnar, Palmar Arch

- **Lower extremity**
  - Posterior Tibial, Dorsalis Pedis

- Progressive diminution in Doppler pulses may indicate need for escharotomy

- Verify that pulselessness not due to other causes
Extremity Escharotomy

Preparation

- Analgesia as needed
- Sterile field
- Scalpel &/or electrocautery
Extremity Escharotomy

Procedure

- Avoid major vessels, nerves, all tendons
- Mid-medial or mid-lateral aspect
- Extend down through eschar, to subcutaneous fat

- Extend length of constricting burn & across involved joints
Extremity Escharotomy

Procedure

• Assess effectiveness of procedure
• Recheck pulses
• Single incision may not be sufficient
• Perform contralateral incision if needed
Hand dorsum escharotomy indication

- Loss of palmar arch pulse
- Full-thickness dorsum burns
- Intact radial & ulnar pulses

Finger escharotomy indication

- Seldom required
- Consult with receiving burn center physician
Edema within (beneath) deep investing muscle fascia

Results from

- High-voltage electric injury
- Massive IV fluid infusion
- Crush injury
- Delayed escharotomy (ischemic-perfusion injury)
Escharotomy usually sufficient to maintain tissue perfusion

Fasciotomy not often required
Facial Burns

- A serious injury
- Consider possibility of respiratory tract damage
Facial Burns

- Assess airway
- Secure tubes
- Raise head 30 degrees
- Cleanse with water
Eye Burns

- Examine eyes early
- Fluorescein to identify corneal injury
- Irrigate chemical injuries with saline as indicated
- Mild ophthalmic solution
- Avoid steroid solutions
- Tarsorrhaphy never indicated in acute phase
Assess external canal & drum early

- External otitis or otitis media
- Risk of tympanic membrane perforation
Ear Burns

Keep pressure off the burned ear
Hand Burns

- Minor injury with temporary disability
  Versus
- Extensive injury resulting in permanent loss of function

- Evaluate vascular status and nerve function
- Elevate
- Exercise
Foot Burns

- Hourly assessment of vascular status & nerve function
- Elevate
- Exercise
- No constrictive dressings
Genitalia & Perineum Burns

- Insertion of Foley catheter to maintain patency of urethra
- Penile escharotomy only after consulting with burn center
- Diverting colostomy not indicated
- Scrotal edema treatment not required
Successful treatment of burn patient requires attention to wound management to promote healing and close the wound.

Wound management never takes precedence over life-threatening injuries or management of resuscitation.

Certain anatomical areas present unique challenges.

Functional outcome may be related to initial management measures.

Severe burns to significant functional or aesthetic areas mandates early care at a burn center.