Traumatic Amputations
Robin Koonce, CPNP-AC
UNC Healthcare
Chapel Hill, NC

Objectives
1. The learner will be able to list the teams involved in the multidisciplinary approach to a traumatic amputation.
2. The learner will be able to discuss the short term and long term psychological effects of a traumatic amputation on a pediatric patient.
3. The learner will be able to describe the wound management options for a traumatic amputation.

Case Overview
FF is a 5 year old male who was admitted to UNC following a lawnmower accident.

Medical Findings Included:
* Traumatic Arthrotomy of his left knee
* Partial amputation of his left foot
* Large soft tissue wound of his left lower extremity
* Penile laceration and avulsion with lost of testicles
Case Overview

Psychological Findings

* Guilt
* Altered coping
* Parental suicidality

Partial Amputation of His Left Foot

Radiographic View of Left Foot
Traumatic laceration and avulsion of his penis and amputation of his testicles

Medical Care

Teams Involved
- PICU
- Pediatric Surgery
- Urology
- Orthopedic Surgery
- Endocrinology
- Pain Team
- PT/OT/ST
- Psychology/Psychiatry
- Plastic Surgery
- Child Life Specialist
- Pastoral Care
- Infectious Disease
- Nutrition
- Interpreter Services

Medical Care
- Multiple OR debridements with Ortho and Plastic Surgery
- Wound vac placement and changes
- Multiple Urologic Interventions
- Pain Management
- Antibiotic Therapy
- Nutritional Support
- Extensive physical therapy and occupational therapy
- Extensive family counseling
- ~ 1 month hospitalization
Psychological Care

- Supportive care team including psychology
- Re-assigning blame for the incident
- Frequent updates utilizing an interpreter
- Utilizing family centered care

Lessons Learned

- "Guilt is to the spirit what pain is to the body"
- Short term grief vs. long term grief
- Consequences of poor coping on the healing process
- The importance of early engagement of psychological support for the family and the patient.

Question

Which parent is more likely to endorse post traumatic stress symptoms after a traumatic event in their child's life?

A. Mother
B. Father
Question

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A. Mother
B. Father

References


Traumatic Amputations

Lynne Farber, CPNP- AC, PC
University of North Carolina
Chapel Hill, NC
### HPI

- History provided by parents and transfer documents
- 12 y/o female attacked by a shark
  - Lower left arm severed below elbow
  - Soft tissue defect 13 X 15cm
  - Extensive soft tissue injury L inner thigh 30 X 40cm
  - Tourniquets applied at scene and transported local hospital
  - OR for wound vac. L thigh and L forearm
  - Transferred to UNC for evaluation and treatment

### PMH
- NONE

### PSH
- NONE

### ALLERGIES
- NKDA

### Family History
- Negative for anesthesia problems or bleeding disorders

### Social History
- Lives with parents and two sisters, 5yo and 13yo
- Entering 7th grade

### ROS
- 10 point review of systems was obtained and negative other than stated

### Physical Exam

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
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<tbody>
<tr>
<td>BP</td>
<td>116/51</td>
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<tr>
<td>Pulse</td>
<td>119</td>
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<tr>
<td>Temperature</td>
<td>36.8 °C</td>
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<tr>
<td>Oral</td>
<td></td>
</tr>
<tr>
<td>R27</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>54 kg (119 lb 0.8 oz)</td>
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<tr>
<td>SpO2</td>
<td>98%</td>
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<tr>
<td>General</td>
<td>NAD</td>
</tr>
<tr>
<td>HEENT</td>
<td>NCAT. Extraocular muscles intact.</td>
</tr>
<tr>
<td>Lungs</td>
<td>Nonlabored breathing</td>
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<tr>
<td>Abdomen</td>
<td>Soft, nondistended</td>
</tr>
<tr>
<td>Skin</td>
<td>WWP'd</td>
</tr>
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</table>
Physical Exam

Extremities:

- LUE: complete amputation in the mid-forearm, dressing in place
- L posterolateral thigh: large soft tissue defect with VAC intact, good seal
- Normal sensation on the dorsal and plantar surface of the left foot
  Able to dorsiflex and plantar-flex the foot
- Able to flex and extend the knee, limited by pain

ID Consultation

- Animal bite. Tetanus UTD at OSH
- Continue gentamicin 2.5 mg/kg q 8 hours
- Continue Anecef 25 mg/kg q 8 hours
- Begin doxycycline 100 mg q 12 hours for vibrio coverage

AAEVM

- Aeromonas species
- Edwardsiella tarda
- Erysipelothrix rhusiopathiae
- Vibrio vulnificus
- Mycobacterium marinum
**PLAN**

**Psych:** Memory of the entire event. High risk acute stress disorder
- Child Life involved, Psychology consulted

**FEN/GI:**
- Regular diet for now
- NPO at midnight for OR tomorrow
- D5 NS MIVF
- strict I/Os

**PICU**

**HEME:** Estimated 1500ml blood loss. Hgb 9.8 (up from 6) after initial resuscitation--CBC in AM

**ACCESS:**
- CVC double lumen, non-tunneled femoral line
- R AL
- 2 PIVs

**HD 1**

- Brought to OR, induced with GA
- Peds Surg, Plastic Surgery, Orthopedic attending present
- L arm defect 13X15CM and viable
  - Sharp debridement /washout performed
    - Included skin, sc tissue, muscle, pulse irritation wound
    - Tissues reapproximated loosely
    - Relatively healthy appearing residual tissue L elbow
    - -forearm stump
  - Wound vac applied black sponge
OR

- L posterior leg defect 30 X 30cm
- Exposed sciatic nerve
- Sharp debridement performed and included skin, sc tissue, muscle and pulse irrigation of the wound
- Lateral skin bridge viable and reattached over exposed sciatic nerve
- R PICC obtained

HD 3

- HD 3 Existing wound vac removed in OR
- Wounds irrigated with 10L saline with antibiotics in 6L of the irrigation
- Deep tissue from wounds sent culture
- Healthy tissue at L elbow and forearm stump

HD 9 OR with Plastics and Ortho

- Ortho team - I&D of left trans-forearm amputation stump
- wound exploration, neurolysis, partial wound closure
- repeat wound VAC placement
Findings: healthy wound bed with intact biceps and brachialis
- Radial and ulnar nerves identified and buried local muscle bellies
- Transected muscle beds used to close radial and ulnar bone ends
- Plastics team performed a split thickness skin graft L thigh
Postoperative Plan

- Local compression with Ace wrap with arm in orthoplast splint
- L arm NWB

Takedown L arm wound VAC
Dressing change R thigh donor site and L thigh skin graft
Wound VACS D/C'd

- All wounds covered skin grafts
- Donor sites healing well
  - Small area skin breakdown L thigh
  - Discharged HD 29 to acute inpatient rehab

Pain Control Recs

- Oxycontin 10mg QHS
- Oxycodone 5mg PO prn dressing changes
- Gabapentin 1200mg PO
- Acetaminophen PO scheduled 15mg/kg (skip middle night dose)
- Valium 5 mg QHS prn muscle spasms
- Consider Celexa neuropathic pain LUE
Shark facts

Since 1900, 5034 shark attacks recorded
- 23.9% fatal
- 80.4% male, 10% female, 9.8% not reported
- Average age 26.1
- # attacks increasing per decade
- 36.1% North America
  - Florida 49.1%, California 13.8%, Hawaii, 13.2%
  - Shark's jaws exert up to 18 tons per square inch of force
- A multidisciplinary approach to management is crucial to patient care

Summary

- Operative treatment, exposed deep structures which require tissue coverage
- Obtain plain films all injured areas
  - Identify fractures and residual tooth fragments
- Wounds grossly contaminated w/sand, debris
  - Closed over a drain or packed w/dressings for delayed closure
- Challenges include: massive tissue loss, hypovolemic shock, and infection
  - Empiric antibiotic treatment is recommended

References

http://www.sharkattackfile.net/

Unger N.R, Ritter E, Borrego R, Goodman J, Osuemyi, O.O.
Antibiotic susceptibilities of bacteria isolated within the oral flora of Florida blacktip sharks: guidance for empiric antibiotic therapy.

Empiric antibiotic treatment is recommended for all shark bites. Coverage should include the following species:

A. Vibrio
B. Aeromonas
C. Staphylococcal
D. Streptococcal
E. All of the above