Management of the Open Abdomen

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OBJECTIVE

- Pathophysiology
- Intra-abdominal Compartment Syndrome
- Management
- Closure
Pathophysiology

- Trauma
  - Damage control Laparotomy
- Intra-Abdominal compartment syndrome
  - Primary, Secondary, and Tertiary
- Evisciration
- Bowel edema from prolonged surgery
Intra-Abdominal Compartment Syndrome (ACS)

• Lethal complication of uncontrolled Intra-abdominal Hypertension (IAH)
  – Intra-abdominal Pressure >25 mmHg
  – Dysfunctiton of 1 or more organs.
• Requires immediate release of pressure - Open the abdomen
• Mortality with treatment >50% with signs of organ failure.
Intra-Abdominal Compartment Syndrome (ACS)

- **Primary**
  - Disease within the abdominal/pelvic cavity
  - Appears early after a surgery
  - Appears within 48 hours of major trauma

- **Secondary**
  - Conditions outside the abdomen
    - Sepsis
    - Burns
    - Massive fluid/blood resuscitation

- **Tertiary**
  - Occurs during prophylaxis to avoid ACS
Intra-Abdominal Compartment Syndrome (ACS) - GRADING SYSTEM

<table>
<thead>
<tr>
<th>GRADE</th>
<th>Intra-abdominal Pressure (IAP)</th>
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<tbody>
<tr>
<td>Normal 0-12</td>
<td></td>
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<tr>
<td>I</td>
<td>12-15 mmHg</td>
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<tr>
<td>II</td>
<td>16-20 mmHg</td>
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<tr>
<td>III</td>
<td>21-25 mmHg</td>
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<tr>
<td>IV</td>
<td>&gt;25 mmHg</td>
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Intra-Abdominal Compartment Syndrome (ACS) - RISK FACTORS

- Free blood and clots
- Bowel edema
- Vascular congestion
- Excessive crystalloid resuscitation
- Intraperitoneal Packing
- Nonsurgical bleeding
- Transfusion > 10 Units pRBC
- Acidosis, coagulopathy, Hypothermia
- Post-op Ileus
Bladder Pressure Monitoring

- Instilling 10-40 ml of water into the bladder measuring pressure at the level of the pubis - Transducer level
IAP > 25 mmHg open the Abdomen
Complications of Open Abdomen

- Fistulas 10-18%
- Anastomotic Breakdown
- Infection
- Bleeding
- Loss of Bowel Function
- Hypothermia
- Loss of Domain
- Massive Fluid Loss
- Electrolyte Loss
- Hernia
Management-Temporary Closure Techniques

- Damage control Celiotomy
- Bogata Bag
- Parachute silk and retention sutures
- Vac Pack
- Abthera or Abdominal Wound vac
- Mesh and Skin Graft
- Whitman/Star closure
- Fascial control and Primary closure
Celiotomy

3 stages of damage-control
1. **Limit initial operation**
   - Control hemorrhage
   - Control contamination
   - Prevent further injury
2. **Resuscitation in SICU**
3. **Reoperation-2nd Look**
   - Definitive repair
   - Missed injury
   - Delayed manifestation
   - Formal closure
Bogata Bag

Sterile Water for Irrigation USP
Retention Sutures, Silk and Pack

Figura 4 - Aspecto final do curativo com a cobertura do campo cirúrgico auto-aderente e a sucção criada pelo sistema de vácuo (-10 a -50mmHg).
Vac Pack

Figura 4 - Aspecto final do curativo com a cobertura do cateter auto-aderente e a sucção criada pelo sistema de vácuo (-10 cmH2O).
Wound Vac

- Loss of Fascial Control
- Long closure time
- Fistula
- Expensive
Mesh and Skin Graft
Mesh and Skin Graft
Whitman Patch

- Fasical Control

Cons
- Requires second modality
- Repeat surgery
- Lifting mesh can cause fistulas
Whitman Patch

Final Fascia to Fascia Closure
Combined

System Applied

System expands in the event of an inflammatory response.

Closure Period: Dynamic re-approximation of muscle/fascia planes.

Fascia Re-approximated

Closure