Surgical Airway

Sybile Val, MD
SUNY Downstate Medical Center
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Case Presentation

• HPI
  – 42 YOF presented to ED on 4/18 with dyspnea

• PMH
  – Asthma
  – ESRD on HD

• PSH
  – RUE fistula creation

• Meds
  – Singulair
  – Advair
  – Albuteral
  – Sensipar

• Allergies
  – NKDA
Case Presentation

• In ED
  – Afebrile, BP 97/66 HR 109 RR 22 Sat 96%
  – On Exam
    • Mild respiratory distress
    • No JVD
    • Rales in lower 1/3 of b/l lung fields, no wheezing
    • No Peripheral edema
Case Presentation
Case Presentation

• Labs
  – Unremarkable

• Plan
  – Admit to Medicine w/ Dx of CHF exacerbation
  – Renal for HD
  – Oxygen therapy initiated
Case Presentation

• Post Dialysis
  – No improvement in SOB
  – Alterations in mental status
  – ABG: 7.17/94/237/36/100%
  – BiPAP initiated
  – MICU consult called

Recommendations:

Intubate the patient
Case Presentation

• Anesthesia consulted
  – Using accessory muscles
  – Obtunded with saturation of 91-96%
  – Attempts at intubation with fiberoptic scope x 2
  – Gastric contents regurgitated

• Surgery consulted
  – Cricothyroidotomy attempted @bedside
  – Pt taken to OR for revision and control of bleeding
Case Presentation
Hospital Course

• POD#1
  – ENT consulted
    • Cricoid cartilage palpable below stoma
• POD#2
  – Tracheostomy revision
• POD#6
  – Weaned from ventilator
• POD#9
  – Trach downsized
  – on HD
• POD#15
  – Cleared for discharge
• POD#26
  – Developed Vfib while on HD

• POD#39
  – New onset A. fib w/ RVR
  – Cardioverted
  – Started on heparin and amniodarone

• POD#45
  – Will watching TV, bright red blood noted from trach
  – Desaturated to 38%
  – Excessive blood in oropharynx
  – Coded, ACLS initiated
  – Pt pronounced @7pm
  – Autopsy declined
Questions??
Surgical Airway

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Indications for Intubation

PHYSIOLOGIC

• Persistent hypoxemia with oxygen supplementation
• PACO2 >55, Ph <7.25
• Vital capacity <15ml/kg with NM d/o
Indications for Intubation

CLINICAL

• Altered mental status
• Respiratory distress with HD instability
• Upper airway obstruction
  – Angioedema
  – Trauma
  – Infection
  – Bleeding
  – Tumor
  – Tracheomalacia
  – Tracheal Stenosis
• Copious secretion requiring frequent suctioning
Indications for Surgical Airway

- Upper Airway Obstruction
- Prolonged intubation
- Chronic respiratory insufficiency
- Neuromuscular disorders

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Surgical Airway

• Historically
  – Acute or impending airway obstruction

• Now …
  – Airway control in conjunction with prolonged usage of mechanical ventilation

• Types
  – Cricothyrotomy
  – Standard tracheostomy
  – Percutaneous dilatation tracheostomy
www.downstatesurgery.org

Cricothyrotyotomy
Standard Tracheostomy
Standard Tracheostomy
Standard Tracheostomy
Standard Tracheostomy
## Complications

<table>
<thead>
<tr>
<th>Early</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>• False passage</td>
<td>• Granulation</td>
</tr>
<tr>
<td>• Decannulation</td>
<td>• Tracheomalacia</td>
</tr>
<tr>
<td>• Pneumomediastinum</td>
<td>• Stenosis</td>
</tr>
<tr>
<td>• Pneumothorax</td>
<td>• Tracheoinnominate fistula</td>
</tr>
<tr>
<td>• Bleeding</td>
<td>• Tracheoesophageal fistula</td>
</tr>
<tr>
<td>• Infection</td>
<td></td>
</tr>
<tr>
<td>• Mucous Plug</td>
<td></td>
</tr>
<tr>
<td>• Negative Pressure Pulm Edema</td>
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</tbody>
</table>
Could we have done something different in this case??
Urgent Surgical Airway Intervention: A 3 Year County Hospital Experience

- Retrospective study at Cook County
- Between August 2001 to October 2003
- 197 subjects in study with 244 day follow up
  - 107 standard trach
  - 90 using awake technique

Fig. 2. Presenting signs and symptoms in patients undergoing awake tracheostomy \( n = 88 \)
Urgent Surgical Airway Intervention: A 3 Year County Hospital Experience

• Awake Technique:
  – Semirecumbent position
  – No general anesthetic
  – Subcutaneous lidocaine
  – Wide incision and use of cricoid hook
  – Direct laryngoscopy if needed
  – Availability of GA and OR

Altman et al.: Urgent Surgical Airway Intervention
Laryngoscope 115: December 2005
Urgent Surgical Airway Intervention: A 3 Year County Hospital Experience

<table>
<thead>
<tr>
<th>Cause of Airway Obstruction</th>
<th>Age</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma, failure to intubate</td>
<td>56</td>
<td>-</td>
</tr>
<tr>
<td>Spine surgery, failure to intubate</td>
<td>41</td>
<td>Cardiopulmonary arrest, neurologic devastation</td>
</tr>
<tr>
<td>Gunshot wound to jaw</td>
<td>39</td>
<td>-</td>
</tr>
<tr>
<td>Gunshot wound to neck</td>
<td>39</td>
<td>-</td>
</tr>
<tr>
<td>Angioedema</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>Epiglottitis</td>
<td>26</td>
<td>Cardiopulmonary arrest, death</td>
</tr>
<tr>
<td>Ludwig’s abscess</td>
<td>26</td>
<td>Cardiopulmonary arrest, death</td>
</tr>
</tbody>
</table>

This group had a more significant set of complications

Altman et al.: Urgent Surgical Airway Intervention
Laryngoscope 115: December 2005
Urgent Surgical Airway Intervention: A 3 Year County Hospital Experience

• Conclusion:

Awake tracheostomy should be considered in any patient with impending or ongoing airway obstruction or potentially difficult intubation

Altman et al.: Urgent Surgical Airway Intervention
Laryngoscope 115: December 2005
When is the best time to offer a tracheostomy?

Although practice varies substantially, tracheostomy timing appears significantly associated with duration of mechanical ventilation, intensive care unit length of stay, and hospital length of stay.

Crit Care Med 2005 Vol. 33, No. 11
References

• ACS Surgery
• Sabiston