Post operative care implications: Total Laryngectomy

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Disclosures: No conflicts of interest

Objectives

- Recognize anatomical considerations: Normal airway vs. total laryngectomy vs. tracheostomy
- Identify issues in post-operative care and type of reconstruction
- Common issues, complications and solutions
- Considerations for patient education and discharge readiness

Total Laryngectomy: Anatomy

- Altered airway
- Irreversible

**Question 1**

Following a total laryngectomy, Mr. John Doe experiences respiratory failure and requires ventilatory support. Which of the following is the best way to intubate Mr Doe?

a) Orotracheal intubation
b) Nasotracheal intubation
c) Intubate through tracheal stoma
d) Perform emergent tracheostomy

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**Total Laryngectomy: Anatomy**

<table>
<thead>
<tr>
<th></th>
<th>Laryngectomy</th>
<th>Tracheostomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stoma permanent</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Connection to pharynx</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Able to intubate orally</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Separation of airway from esophagus</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Risk of aspiration of oral/nasal/upper pharyngeal secretions</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

**Total Laryngectomy patients are Compulsory Neck Breathers**
Stoma, Airway & Wound Care

- Permanent stoma sutured to skin
- Laryngectomy tube use: optional & temporary
- Clean stoma every shift: remove crusting with saline soaked gauze/ Q-tips
- Encourage deep breathing, coughing: Expel crusts, mucus plugs
- Suction with saline irrigation every shift and as needed

Special mention:
Free flap reconstruction
for reconstruction in patient with total laryngectomy

- Large tissue defects repaired with free flaps
- Depend on newly anastomosed vascular supply
- In such patients, Avoid neck ties, Velcro straps or other possible constrictors

Complication: Airway obstruction

- ORAL Intubation IMPOSSIBLE
- Ensure secure airway through the neck stoma
- High flow O2
- Early call for help
- Ensure availability of key supplies:
  - IV access
  - Suction
  - Forceps, suction catheters
  - Lighting
  - Airway supplies

Stoma, Airway & Wound Care

- Use humidification: reduce crusts and mucus plugs
- Nose and mouth humidify and warm air; in laryngectomy patients, this is lost
  - Early: humidification tent
  - Later: HME filters/ foams
- Engage patient and caregiver early
- Teach self care

Stoma, Airway & Wound Care

- Clean incisions every shift: remove crusting with saline soaked gauze/ Q-tips, apply topical ointment if ordered
- Monitor drains for output: amount and quality
  - Can indicate salivary leakage
Complication: Airway obstruction

- Stomal swelling/tightening
  - Usually a gradual onset
  - If airway looks very tight, Call MD
- Foreign body
  - Large stoma makes foreign bodies easier
  - Heimlich maneuver
  - Keep patient calm, Call MD
- Mucous Plug
  - Same signs/symptoms as with trach patient
  - Remove plug if easily visible
  - Place on high O2 and Call MD

Issue: Laryngectomy tube displacement

- NBD
- Replace tube

Question 2

Following a total laryngectomy, which of the following can contribute to airway compromise?

a) Foreign body
b) Mucus plug
c) Tracheal cast/ crusts
d) All of the above

Answer 2

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Total Laryngectomy patients require Meticulous stoma and airway care

Nutrition

- Key factor in healing and recovery
- Often with nasogastric tube or gastrostomy tube
- Early nutrition consult and enteral feeding
- Do not manipulate/ replace NG tube:
  - Risk to disrupt new pharynx closure

Resumption of oral intake

- Timing of oral intake depends on:
  - Patient anatomy & type of reconstruction
  - Post surgical course
  - H/O neck radiation
  - Surgeon preference
- H/O radiation may contribute to poor healing: resume oral diet in 14 days
- No h/o radiation: resume oral diet in 5-7 days
- Leak test/ radiograph swallow study may be requested
Controversies in timing of resuming oral intake

Early oral feeding following total laryngectomy


Controversies in timing of resuming oral intake

TABLE III

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Early (%)</th>
<th>Delayed (%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Fistula</td>
<td>90</td>
<td>76</td>
<td>0.05</td>
</tr>
<tr>
<td>Fistula</td>
<td>10</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Fistula rate</td>
<td>6.7%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Median fistula diagnosis day</td>
<td>11</td>
<td>14</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Fistula rate (6.7% Vs 10%)

Four cohort studies ~ 490 patients
No significant difference
Fistula rate (12.2% Vs 10.1%)

Unclear if timing of feeding affects rate of fistula formation

Controversies in timing of resuming oral intake


Assessment and Incidence of Salivary Leak Following Laryngectomy

Hillary N. White, MD, Blake Golden, MD, Lauren Sweeney, MD, William R. Carroll, MD,
Jeffrey S. Mergenhagen, MD, and Ellen L. Rosenfeld, MD
From the Department of Surgery, Division of Otolaryngology-Head and Neck Surgery, University of Alabama at Birmingham, Birmingham, Alabama, U.S.A.

Barium swallow @ 1 week
Sensitivity 26%
Specificity 94%

Positive test suggests a leak
Negative test: may still have a leak, maintain clinical vigilance

Complication: Pharyngocutaneous Fistula

• Breakdown of pharyngeal closure -> Salivary leak/ fistula
• Features s/o neck infection
  – Fever
  – Redness
  – Firm induration, tenderness
  – Cloudy/ purulent drainage
  – Breakdown of incisions

Complication: Pharyngocutaneous Fistula

• Manage conservatively when fistula drainage controlled
  – Drainage
    – Wet to dry dressing/ wound vaks (selective cases)
    – ABX
  – Supportive care (nutrition/ wound care etc.)
• Reoperative interventions (selectively)
  – Debridement
  – Tissue transfer
• Possible complications
  – Sepsis/ Cellulitis/ Mediastinitis
  – Vascular exposure/ Bleeding
  – Death

Early oral feeding Vs Delayed Feeding
Four RCTs ~ 180 patients
No significant difference
Fistula rate (6.7% Vs 10%)
Four cohort studies ~ 490 patients
No significant difference
Fistula rate (12.2% Vs 10.1%)
Some patients more likely to develop fistulae…

- Previous radiation
- Hypothyroid
- Primary closure in setting of salvage surgery
- Nutritional depletion

Patients with high risk for fistula formation:
- Preoperative counseling
- Modification of operative technique
- Prehab and Rehab implications

Question 3
Following a total laryngectomy, which of the following is an important risk factor related to salivary fistula formation?

a) Age  
 b) History of neck radiation  
 c) Stage of tumor  
 d) Use of perioperative antibiotics

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Patients with prior h/o head and neck radiation are at high risk for salivary fistula formation

Early Speech Rehabilitation

- Patients are unable to speak normally after procedure
  - Require notepad/white board
  - iPad/ computer voice synthesizers
  - Speech therapy consulted

- Alternative modes of speech
  - Electrolarynx
  - Tracheo-esophageal puncture (TEP)
  - Esophageal speech (burp)

Early Speech Rehabilitation

- Alternative modes of speech: Electrolarynx
  - Reliable
  - No surgery needed for use
  - Mechanical sound

Early Speech Rehabilitation

- Alternative modes of speech: Tracheo-esophageal puncture (TEP)
  - Reliable
  - Requires a procedure
  - Maintenance of valve
Other issues & physical changes

- Showers - water can easily pass into airway (unless a shower cover is used)
- Can’t swim
- Unable to bear down: Manage constipation
- Smell impaired: Can’t sniff -> Taste affected
- Body Image issues
- Intimacy issues
- Depression

Discharge Readiness

- Early patient and caregiver engagement
- Teach self cares
- Stoma and incision care
- Availability and use of:
  - Suction
  - Humidification
  - Stoma supplies
- Speech rehabilitation
- Access to help
  - Physician team
  - Registration with local fire and rescue dept.

Resources


Perspectives in Nursing: Post-operative care of the laryngectomy patient. Website: [http://www.perspectivesinnursing.org/assets/perspectives5.pdf], Accessed September 27, 2017

Support for People with Oral and Head and Neck Cancer ([www.spohnc.org](http://www.spohnc.org))

International Association of Laryngectomees ([www.theial.com](http://www.theial.com))

American Cancer Society ([www.cancer.org](http://www.cancer.org))