Minimally Invasive Open Tracheostomy: A Safe, Effective Compromise

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ABSTRACT

• Historically, tracheostomy is an open surgical procedure in the operating room
• Minimally invasive open tracheostomy combines the advantages of open and percutaneous techniques. The procedure has been used in the last 2 years and 170 cases at a tertiary referral academic medical center. This poster describes the technique and presents important data from this center.

INTRODUCTION

• Tracheostomy is an extremely common procedure among otolaryngologists with numerous indications and expanding protocols.

• Historically, tracheostomy is an open surgical procedure in the operating room.

• Preparation of percutaneous, bedside tracheostomy began with cost-effectiveness of open surgical tracheostomy (ST) versus percutaneous tracheostomy (PT) studies.

• Numerous studies and meta-analyses have compared the safety and efficacy of open surgical open ST versus percutaneous tracheostomy (PT).

METHODS

• ST is a neck high, right-sided technique of hybrid tracheostomy that combines the advantages of open and percutaneous techniques. The procedure has been used in the last 2 years and 170 cases at a tertiary referral academic medical center. This poster describes the technique and presents important data from this center.

• ST tends to have a lower rate of stomal infection.

• ST is usually shorter than PT.

• Decreased bleeding and infection in PT likely result from decreased exposure to the surgical field and soft tissue dissection.

• ST offers direct visualization to decrease risk of falsely percutaneous tube malposition and easy access to the cricoid cartilage.

• PT provides the benefit of decreased soft tissue dissection to limit inflammation and fibrosis, but does not provide a surgical view of the necessary anatomy.

• The safety of HT has not been compared to ST.

RESULTS

• Operative reports were reviewed to confirm indications, technique and complications relevant to the outcomes.

• Complications included any intra-operative problems, post-operative bleeding, infection and accidental decannulation.

• Patients were excluded for inadequate available data, age < 18 years, emergent or revision surgery

• 44 patients underwent ST between Feb 2005 – June 2007

• 94 patients underwent HT between June 2007 – Feb 2011

• Documentation was available for all cases that included only tracheostomy, and no other procedures (i.e., direct laryngoscopy and biopsy, fracture repair, carinoma resection and reconstruction, etc); this record was not always available on earlier patients.

• There is no statistically significant difference in the safety of HT compared to ST

DISCUSSION

• HT appears to be more rapid than either PT or ST. It provides the excellent airway control and visualization of ST, while being similarly or less invasive than PT.

• In our experience, there were no significant complications with either technique.

• The opinions or assertions contained herein are the private views of the author(s) and are not to be construed as official or as reflecting the views of the Department of Defense.

REFERENCES


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TABLE 1. Complication Rates

<table>
<thead>
<tr>
<th>Event</th>
<th>Complication, ST</th>
<th>Complication, HT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Bladderotomy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

TABLE 2. Tracheostomy Techniques

<table>
<thead>
<tr>
<th>Technique</th>
<th>Description</th>
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<tbody>
<tr>
<td>ST</td>
<td>Surgical incision of the neck.</td>
</tr>
<tr>
<td>HT</td>
<td>Incision similar to ST, guided by direct visualization.</td>
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</tbody>
</table>

TABLE 3. Tracheostomy Tubes

<table>
<thead>
<tr>
<th>Tube Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Surgical</td>
</tr>
<tr>
<td>HT</td>
<td>Percutaneous</td>
</tr>
</tbody>
</table>

FIGURE 1. Planned incision 1 cm below cricoid cartilage.

FIGURE 2. Cricoid hook is placed for superior airway control and traction.

FIGURE 3. Post-operative bleeding: 1 ST, 3 HT.

FIGURE 4. Tracheal view through the stoma.

FIGURE 5. Completed tracheostomy.

CONCLUSIONS

• HT is a safe tracheostomy technique which combines the benefits of surgical exposure and minimal dissection.

• HT is a faster technique when compared to ST.

• HT made up the majority (68%) of the patients, there was no statistically significant difference in patient age per group.

• There is no statistically significant difference in intra-operative or post-operative complications in ST versus HT.

• Surgical time was significantly less in the HT compared to the ST group.

FIGURE 4. Tracheal dilation.

FIGURE 5. Completed tracheostomy.

FIGURE 6. Cricoid hook is placed for superior airway control and traction.

FIGURE 7. Post-operative bleeding: 1 ST, 3 HT.

FIGURE 8. Tracheal view through the stoma.