Bedside Endoscopic Percutaneous Tracheostomy

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Tracheostomy is a frequently performed procedure, which carries a mortality rate of up to 5% and morbidity rate as high as 66%. It is primarily performed to facilitate prolonged positive pressure ventilation. Recently, a few authors have described bedside percutaneous tracheostomy and emphasized its simplicity and safety. We report 13 cases of intensive care unit patients (intubated and ventilated) who had the procedure performed at their bedside. No morbidity or mortality occurred related to the procedure. We recommend percutaneous endoscopic tracheostomy to be used routinely for intensive care unit patients who require tracheostomy.

Airway protection or positive pressure ventilation for a longer period than would be appropriate with an endotracheal tube are the main indications to perform tracheostomy.\(^1,2\) In 1909 Jackson described the technique of operative tracheostomy which is used today.\(^3\) Recently, a few reports have described percutaneous tracheostomy\(^4-10\) where the procedure was found to be rapid, simple and safe.

**Material and Methods**

Tracheostomy is performed in the intensive care unit (ICU) with the patient sedated, paralysed and ventilated on 100% oxygen.

A guide wire is introduced through a needle which is inserted between 1st and 2nd tracheal ring, and its position is confirmed using the fibro-optic bronchoscope.

A skin incision about 1 cm long is made, centred on the guide wire, and the tract is progressively dilated using the Ciaglia percutaneous introducer set up to the required size. The tracheostomy tube is then passed, threaded over a smaller dilator.

**Results**

Since April, 1989 we have performed 13 elective percutaneous endoscopic tracheostomies in five females and eight males with an average age of 40 years (range 14–65 years).

The indications to perform tracheostomy were either ventilatory support expected to last for several weeks, the necessity to establish an access to the airway for breathing, and removal of secretions (Table 1).

<table>
<thead>
<tr>
<th>Clinical condition</th>
<th>No.</th>
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<tbody>
<tr>
<td>Cerebrovascular accident</td>
<td>5</td>
</tr>
<tr>
<td>Myocardial infarction (after arrest)</td>
<td>3</td>
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<tr>
<td>Respiratory failure</td>
<td>2</td>
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<tr>
<td>Others</td>
<td>3</td>
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Table 1

**Conditions for which percutaneous tracheostomy was performed**
All the patients were endotracheally intubated for an average of 9 days (range 2–16), and all except one had a tracheostomy tube size 30 Fr. The exception was a 14-year-old girl who required a 24 Fr tracheostomy tube inserted as described.

The duration of tracheostomy cannulation varied from 2 to 160 days with a median of 14 days. There was no morbidity or mortality related to the insertion of the tracheostomy tube.

Four of our patients are still alive. One of them is in a vegetative condition 160 days after insertion of his tracheostomy tube; another has been discharged from hospital and it is 70 days since his tube insertion for bilateral vocal cord paralysis. The remaining two are still ventilated in the ICU 20 days and 6 days after insertion of their tubes. All the other patients expired due to their original clinical problems.

Discussion
Tracheostomy performed in critically ill patients is associated with minimal perioperative mortality and morbidity if an experienced surgeon and anaesthesiologist participate in every procedure, but generally a perioperative mortality of 3–5% and a morbidity of up to 66% have been reported.

Although endotracheal intubation for up to 3 weeks has been tolerated without sequelae the optimal time to perform a tracheostomy remains controversial.

Percutaneous dilatational endoscopic tracheostomy offers several advantages. It is rapid, simple, avoids operating room scheduling constraints, reduces the cost of performing the operation in the operating room, is almost totally free from infectious problems and the patient is left with minimal cosmetic deformity.

The lack of tracheal destruction and infections associated with this percutaneous technique will likely diminish the subsequent risk of stenosis. Although the development of tracheal stenosis could not be assessed in our patients, as most of them died early from their original disease, other reports showed no cases of stenosis during 2 years of clinical follow-up of survivors. Preliminary results of tracheal tomogram studies up to 6 weeks after decannulation show a lower incidence of tracheal stenosis with percutaneous dilatational tracheostomy than with operative tracheostomy.

Our experience agrees with that of others namely that percutaneous tracheostomy is a simple and safe elective technique and should be the procedure of choice for ICU patients who require tracheostomies.

References