
CLINICAL ANAESTHESIA

PERCUTANEOUS TRACHEOSTOMY: A MODIFIED TECHNIQUE FOR RESOURCE-POOR SETTINGS

Asoka Gunaratne^{1*}, Upul Hapuarachchi²

¹Teaching Hospital, Karapitiya, ²Faculty of Medicine, University of Ruhuna, Galle.

* Corresponding author's e-mail: asoka.gunaratne@yahoo.com

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Percutaneous tracheostomy was first described by the Italian surgeon Sanctorio Sanctorius in 1626 at the University of Padua. The currently used dilatational technique was introduced by the American surgeon Pasquale Ciaglia in 1985.

Benefits of tracheostomy

- Less requirement of sedation
- Improved oral hygiene
- Easy bronchial toilet
- Reduced dead space
- Reduced risk of glottic trauma

Tracheostomy is a frequently performed procedure on patients receiving critical care. Most of them are too ill and are connected to many machines which make it difficult and dangerous to transport them to operating theatres for formal tracheostomy. Percutaneous tracheostomy can be performed in the intensive care setting itself by the critical care team without imposing a strain on the surgeons' schedule. It is associated with less intra and post operative complications including fewer stomal infections and reduced bleeding problems due to the tamponade effect of the tightly fitting tracheostomy tube. Cosmetic results are better. Clinically significant long term sequelae are no more frequent than the surgical tracheostomies.

Patient selection

Careful selection of patients is critical in detecting potential problems. The following patients should be excluded from the procedure.

- Patients with a short neck in whom the cricoid cartilage cannot be palpated
- Goiter overlying the puncture site

- Previous history of surgery or radiotherapy to the neck
- Children
- Cardiovascular instability
- High Positive End Expiratory Pressure
- Presence of coagulopathy

Technique

Percutaneous tracheostomy is performed in the ventilated anaesthetised and paralysed patients who should be starved. Inspired oxygen concentration should be increased to 100%. Two doctors are required, one for the performance of bronchoscopic guidance and the other to perform the tracheostomy.

The patient is positioned supine with the neck extended. The endotracheal tube is withdrawn under laryngoscopic vision until the cuff is visible between the cords. This should result in the distal tip of the tube to be above the proposed puncture site of the trachea. The operative field is infiltrated with local anaesthetic, which should include epinephrine to reduce the risk of bleeding. An angle piece with an opening at the top is used to accommodate the bronchoscope while ventilating the patient.

Percutaneous tracheostomy using the standard equipment is expensive. We describe a modified technique, which is as effective and less costly.

Method

We performed tracheostomy in 10 patients using the modified technique. A needle and the guide wire from a Central Venous Pressure (CVP)

measurement set was used in the Seldinger technique to cannulate the trachea. A cannula (over needle) introducer is inserted into the trachea in the midline, aiming posteriorly and slightly caudad (Fig1). Site was usually the first or the second tracheal space. The second operator viewed the tracheal lumen bronchoscopically to make sure the needle was in the midline and did not hit the posterior tracheal wall. Once the needle was in the trachea the cannula was advanced and the needle withdrawn. Next the guide wire was introduced without resistance through the cannula which was then removed. The trachea was dilated around the guide wire with the plastic CVP dilator. This dilator is then removed maintaining guide wire position. Next a metal tracheal dilator that could be autoclaved obtained from a used percutaneous tracheostomy set was used to further dilate the trachea (Fig 2). The curved dilator was railroaded over the guide wire before dilation. A normal tracheostomy tube was used. However, a wedge had to be cut in its stillette using a scalpel to accommodate the guide wire.

On call ENT or the general surgeon was informed about the procedure to obtain surgical help should it become necessary.

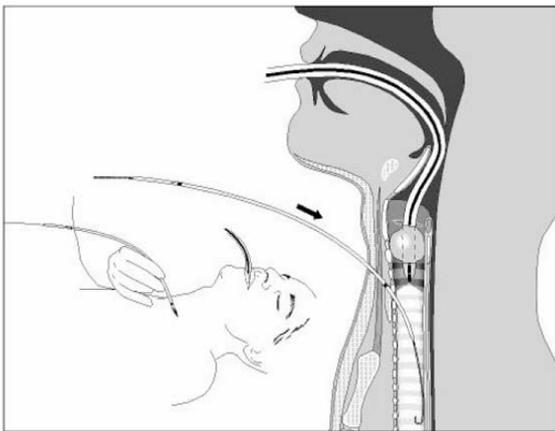


Figure 1

Complications

Peri operative complications

- Hypoxemia
- Loss of PEEP
- Haemorrhage

- Surgical Emphysema
- Pneumothorax
- Tracheal tears

Early post operative complications

- Blockage of the tube with blood or secretions
- Secondary haemorrhage
- Stomal infection

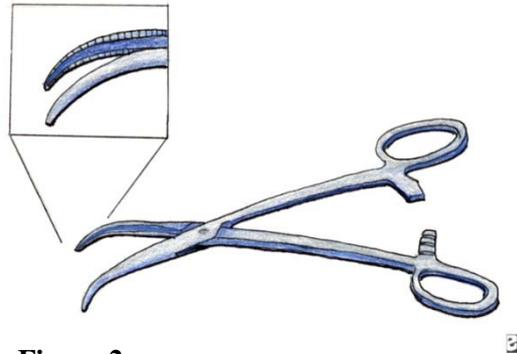


Figure 2

Results

All 10 patients had a successful tracheostomy. No complications were noted. In one patient the trachea could not be dilated with the CVP dilator after successful cannulation. In this patient the tracheostomy was done by the standard surgical technique.

Conclusions

This modified technique of percutaneous tracheostomy can be recommended for resource-poor Intensive Care Units.

References

1. Sabine M Eggert, Craig Jerwod, Percutaneous tracheostomy. BJA CEPD Reviews 2003; 3: 5 139-142.
2. Scott E Brietzke, Percutaneous tracheostomy. eMedicine specialities: Otolaryngology and facial surgery.
3. A Rudra, Percutaneous tracheostomy. Update in Anaesthesia 2002; 15: Article 16