Case report - Thoracic general

A rapid bail-out technique for reinsertion of a displaced tracheostomy tube in difficult situations

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Abstract

Safe and rapid repositioning of a displaced tracheostomy tube is vital to protect the airway and to avoid a potentially life threatening situation. This article describes a simple bail-out technique to avert prolonged airway compromise. This is particularly useful in patients with obesity, large goitre or maxillofacial injuries.

Keywords: Tracheostomy; Maloney dilator

1. Introduction

Tracheostomy is a routine procedure performed on intensive care patients to provide medium to long-term ventilation. In ventilated patients, obesity, goitre or maxillofacial trauma precludes adequate access to the trachea. In these cases, a dislodged tracheostomy tube results in airway compromise when the tube is not rapidly repositioned. We describe a simple and novel technique for rapidly reinserting a displaced tracheostomy tube in an obese patient with a large goitre.

2. Case report

A 70-year-old female patient presented with acute pneumonia caused by Hemophilus influenzae. She developed profound respiratory acidosis and rapidly deteriorated into respiratory failure requiring endotracheal intubation and mechanical ventilation. An elective tracheostomy was performed to provide adequate toilet for thick and viscous secretions. The procedure was complicated by the presence of a large multinodular goitre with intra-thoracic extension causing posterior tracheal displacement. Through a transverse cervical incision, an 8.0 mm internal diameter (I.D.) adjustable flange extra length tracheostomy tube (Portex Ltd; Kent, UK) was inserted through the goitre. On the seventh day, the tracheostomy tube was inadvertently displaced while attempting to dislodge impacted material. The tracheostomy site was barely visualized by direct inspection and, moreover, due to the increased depth complicated by the goitre; it proved impossible to precisely re-insert the tracheostomy tube.

3. Technique

We devised a rapid bail-out technique for reinserting the tracheostomy tube without resorting to a second surgical procedure. An endotracheal tube was placed for airway control and a suitably sized mercury filled bougie (Maloney dilator, 20F) that would easily pass through an 8.0 mm I.D. tracheostomy tube was selected. The obturator was removed and the Maloney dilator was inserted into the tracheostomy tube (Fig. 1). The tip of the Maloney dilator was inserted through the existing cervical opening and guided into the trachea under direct vision. The lubricated tracheostomy tube was railroaded over the dilator and secured.

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Fig. 2. This Figure shows the reinserted tracheostomy tube directed by the Maloney dilator.

guided into position (Fig. 2). The dilator was removed, the cuff was inflated and the tracheostomy tube flange was secured to the skin. The end-tidal carbon dioxide was measured to confirm satisfactory position.

4. Discussion

Tracheostomy is usually achieved with minimal morbidity and mortality [1]. However, in obese patients with a short neck and in the presence of a large goitre obscuring the normal anatomy, this procedure is fraught with significant complications such as haemorrhage, inadequate or poor tracheostomy positioning and more alarmingly in the event of a displacement, an inability to promptly reinsert the tracheostomy tube.

The potential options available are either the use of a ‘tube-changer’, which is used to replace a single lumen with a double lumen endotracheal tube or the use of a Seldinger technique to reinsert the tracheostomy tube. The ‘tube changer’ may not serve the purpose since it requires the presence of a tracheostomy tube in position to allow the exchange. A Seldinger technique requires a needle routing into the tract to allow passage of a guide wire and railroading of a dilator to widen the tract and reinsert the tracheostomy tube. This may not be possible due to both, the angulation between the plane of the tract in the goitre and the tracheal lumen, and lack of control on the direction of the distal end of the flexible guide wire.

An ideal tool should possess a thin tapered tip to manoeuvre through the goitre into the tract and a semi-rigid body with a graded increase in the diameter to progressively dilate and allow control of the tract. Maloney dilators are in common use for dilatation of benign oesophageal strictures [2]. However, their value for re-insertion of tracheostomy tubes has not been previously described. The tapered tip permits visualization as the tract is entered and the semi-rigid nature of the Maloney dilator angulates sufficiently to provide adequate local control and directs the tube into an appropriate position. Due to a gradual increase in diameter of the dilator, it requires to be inserted through the tracheostomy tube prior to starting the procedure. Additionally, this allows railroading and advancing of the tube along the dilator without removing it to avoid ‘losing’ the tract. The small diameter of the tapered end of the Maloney dilator does not occlude the tracheal lumen and permits satisfactory airflow.

5. Conclusion

This technique is a safe and simple method of rapidly securing airway control at the bedside in difficult situations without resorting to a potentially complex second surgical procedure.

References
