A Simple Solution to a Difficult Orogastric Tube Placement

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Citation

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Abstract

Difficulty placing orogastric tubes in anesthetized patients is well known to anesthesiologists. Many different techniques have been used to try to solve this problem. We report the use of a standard endotracheal tube placed into the esophagus as a conduit to promote safe and easy passage of an orogastric tube (OGT) in an anesthetized patient. We present data correlating ideal conduit size with various different OGT sizes.

INTRODUCTION

Gastric decompression after intubation is required for many different indications and is routinely performed intraoperatively via insertion of an orogastric tube (OGT)[1]. Passage of a well-lubricated nasogastric tube is a simple process in an awake patient but requires cooperation. Having the patient swallow during advancement promotes movement from the nasopharynx into the esophagus and eventually into the stomach. When patients are anesthetized and intubated, they can no longer assist with passage of a tube, resulting in significantly increased difficulty. The tube often gets caught and coils in the pharynx preventing movement into the esophagus. Maneuvers such as manual displacement of the larynx, direct visualization of the esophagus with a laryngoscope, and use of a cooled OGT have been tried, but all have drawbacks[2]. We describe a case of an orogastric tube that was successfully placed using a standard ETT as a conduit. Radiographic images were used to provide conclusive evidence of gastric placement. We also present findings of tube size matches in case a different size gastric tube is required.

CASE REPORT

A 63-year-old male was to undergo an open reduction and internal fixation of a left ankle fracture at the distal tibia. He incurred the injury due to a fall. He was noted to have adult-onset diabetes mellitus, which was controlled with oral hypoglycemic agents. After an overnight fast and a femoral/sciatic nerve block, he was taken to the operating room. After placing standard ASA monitors and performing a safety check, anesthesia was induced, and the trachea was intubated. After intubation, an attempt at OGT placement was made due to the possibility of retained gastric contents secondary to diabetes-related gastric hypomotility. Several unsuccessful attempts were made to place an 18 French OGT (Salem sump type). Several maneuvers were attempted including direct visualization of the esophagus, manual displacement of the larynx, and addition of extra lubrication. The tube reliably entered the esophagus but would not advance more than a few centimeters distally. To attempt to bypass the upper esophagus, a standard 8 mm endotracheal tube (ETT) was trialed as a conduit for the gastric tube. Under direct vision with a Miller 2 laryngoscope, an 8 mm ETT (Shiley, Covidien) was well lubricated with water-based lube and was placed into the esophagus to 32 cm, with the 15 mm adapter at the level of the lips (Figure 1). An 18 French OGT was lubricated with silicon-based lube and inserted into the ETT, then slowly advanced to 62 centimeters. This distance was estimated by measuring the length from the mouth to the mastoid process, then to the xyphoid. Approximately 125 ml of clear, yellow gastric fluid was removed with active suction. A radiograph was obtained which revealed gastric tube was correctly positioned, with the ETT conduit was positioned just proximal to the diaphragm and adjacent to the 11th thoracic vertebra, corresponding to the endpoint of the esophagus[3] (figure 2). Both tubes were removed without incident. The repair of the fracture was completed, and the patient recovered without incident.

DISCUSSION

Placing an orogastric tube while a patient is under general

anesthesia is frequently necessary and can be difficult due to anatomical obstruction. The sites most common for prevention of passage include the piriform sinus and arytenoid cartilage[4]. When placing an nasogastric tube (NGT) or orogastric tube (OGT) in an awake patient, voluntary swallowing can aid in bypassing these sites of obstruction. Voluntary closure of the glottis can prevent accidental tracheal placement. In the anesthetized and intubated patient, this assistance is no longer present. In addition, the tubes often become warm and flexible, resulting in increased likeliness of coiling or kinking, which in turn lead to malposition[4]. Subsequent attempts to place the tube can be less successful due to the increased warming of the tube, as well as mucosal trauma. Flexing the neck to keep the OGT posterior and anteriorly displacing the thyroid cartilage to decrease laryngeal obstruction have been tried with limited success. Various techniques to help pass the tubes to a gastric location have been tried, including use of a wired stylet or a frozen OGT to increase rigidity, use of Magill forceps to guide esophageal placement4, and use of an endotracheal tube as a conduit, as we used in this report. The risks with all these techniques include mucosal bleeding, perforation, and accidental tracheal intubation.

Previous studies that have explored using an ETT as a conduit showed that this method greatly increased the success on the first attempt to 100%. These were anesthetized patients in the emergency department, placed by EMT5. No use of this method in an intraoperative setting have been described. No radiography was done and the distance of the tube from the mouth to stomach was not recorded. Also, other studies did not discuss what type of lubrication was used during the procedure.

The authors of this report have used this technique many times and have had complete success when a blind OGT insertion initially fails. In figure 3, we also present which size gastric tubes fit within which size endotracheal tubes. This information can be helpful with smaller patients in whom an 18 French OGT is not appropriate. In the author's opinion, of all the techniques for passing an orogastric tube into the stomach when the standard approach fails, the ETT conduit technique seems to be the most expeditious and safe when compared to increasing OGT rigidity via stylet or freezing. In our experience, coating the ETT with water-based lubricant (SurgilubeTM) and the OGT silicon-based lube is the most optimal combination of lubricants to improve success. Silicon lubricant as is commonly used during bronchoscopy to decrease friction between the bronchoscope and the ETT, which is replicated between the OGT and the ETT. We noted using silicon optimized the free mobility between the OGT and ETT during passage into the stomach.

With regards to ETT conduit placement, we consider the combined length of the oropharynx and the esophagus compared to the length of an ETT. The average length of the oropharynx is 12 cm[6], and the average length of the esophagus is 23.42cm +/- 2.02 cm in adults[7]. The length of an 8 mm ETT is 34 cm[8]. Therefore, by combining the average oropharynx and esophageal lengths (35.4cm), we can conclude that the 8 mm ETT inserted with the 2 cm connector at the level of the lips is roughly 36cm deep, and at the GE junction.

In summary, our suggested method of using an ETT conduit to assist in difficult OGT placement in anesthetized patients is as follows:

1) Determine ideal OGT size for patient, then identify ideal ETT conduit size (figure 3).

2) Coat ETT with water-based lubricant, and OGT with silicon-based lubricant.

3) Perform a direct laryngoscopy.

4) Insert ETT into the esophagus, and advance until the 15 mm adapter is at the level of the lips.

5) Insert OGT into ETT and slowly advance.

6) Maintain firm forward pressure on OGT, keeping it in place while withdrawing and removing the ETT.

Figure 1

18 French orogastric tube inside of an 8mm standard endotracheal tube at 63 cm noted at the 15 mm adapter (black arrow)

Figure 2

Radiograph showing the location of the endotracheal tube in the trachea with its tip just above the carina (white arrow), the endotracheal tube conduit in the esophagus with its tip in the distal esophagus (black arrow) and orogastric tube with its tip inside the stomach (grey arrow).

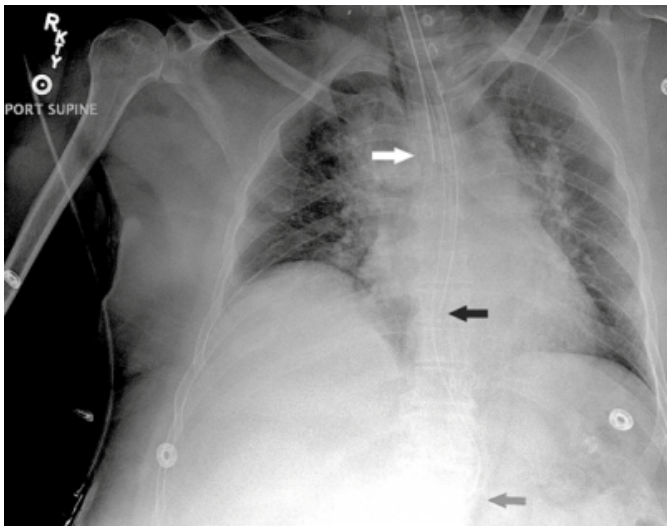

Figure 3

Chart describing ETT size (mm) required for a given OGT size (Fr). A + denotes that the OGT will fit inside the chosen ETT, and a – denotes that it will not.

Orogastric Tube size (french)

Endotracheal Tube size (mm)	18	16	14	12	10
8	+	+	+	+	+
7.5	+	+	+	+	+
7	+	+	+	+	+
6.5	+	+	+	+	+
6	–	+	+	+	+
5.5	–	–	+	+	+
5	–	–	+	+	+
4.5	–	–	–	+	+
4	–	–	–	+	+

+ Denotes the orgastric tube WILL fit inside the Endotracheal tube

- Denotes the orgastric tube WILL NOT fit inside the Endotracheal tube

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