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A Simple Technique to Improve Standard Nasotracheal Intubation

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Abstract

NTI is included in the ASA difficult airway algorithm. However, even with the assistance of a Magill forceps, it might be difficult to place the endotracheal (ET) tube in the trachea because of the angle at which the tube approaches the glottis opening and the inability to bend the tube secondary to the ET-tubes compliance. By placing a soft suction catheter thru the ET-tube, and placing the suction catheter into the trachea first and sliding the tube over the catheter this problem can be avoided. In addition, grabbing the suction catheter rather than the ET-tube, also prevents the rupturing of the ET-tube balloon by the Magill forceps.

Keywords

Nasotracheal Intubation, Difficult Airway, Pediatrics

1. Introduction

Nasotracheal intubation (NTI) is an airway management technique that can help facilitate an elective surgical procedure and provide a life-saving option in an emergency. In fact, NTI is included in the ASA difficult airway algorithm as an alternative to invasive airway access [1].

The two most frequent approaches to NTI are the fiberoptic approach or direct laryngoscopy with Magill forceps. The fiberoptic approach requires special equipment and can be time consuming. Direct laryngoscopy and placement of the ET-tube with a Magill forceps may be difficult secondary to the stiffness of the endotracheal tube and can cause trauma. The traditional approach to NTI has been to pass the tube through the nares and then to guide it through the vocal cords either blindly, or via the use of a fiber optic or under direct laryn-

goscopy with Magill forceps. While blind NTI is readily available without additional equipment, one study suggests it has a success rate ranging from 58% - 72% [2] and may lead to time pressure if multiple attempts are needed. Other limitations of the blind approach include the need for twisting the tube and laryngeal manipulation, resulting in unnecessary trauma to the airway. There are also case reports of rare complications including avulsion of the turbinate [3] [4], unilateral vocal cord paralysis [5] and the inability to pass the nasotracheal tube [6]. While the Magill forceps are useful in guiding the nasotracheal tube past the vocal cords, care must be taken to avoid excessive maneuvering in order to minimize risk of local trauma and rupture of the nasotracheal tube balloon. Additionally, the stiffness of the tube and the angle at which the tube approaches the trachea may make advancing the tube into the trachea difficult.

For pediatric patients, a size 10 French soft suction catheter is lubricated and can be threaded through a size 4.0 endotracheal tube (**Table 1**, **Figure 1**). For adults, a size 16 French soft suction catheter will fit through a size 6.0 endotracheal tube.

Table 1. Largest soft catheter that will fit into different ET tube sizes.

	ET/soft catheter							
ET internal diameter	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Maximal size of soft catheter	6 fr	8fr	8 Fr	10 Fr	12 Fr	14 Fr	14 Fr	16 Fr

These are the largest soft suction catheter that will fit through various endotracheal tubes (ET) to assist in intubations that require the use of a Magill forceps. We recommend that you place the soft suction catheter before attempting the intubation since there might be slight variations in sizes by different companies. With the use of cuffed tubes, by placing the soft catheter into the trachea with the Magill forceps it prevents the tearing off the cuff. Although we placed the correct catheter size for the 2.5 ET tube, we have never intubated a neonate using this technique.

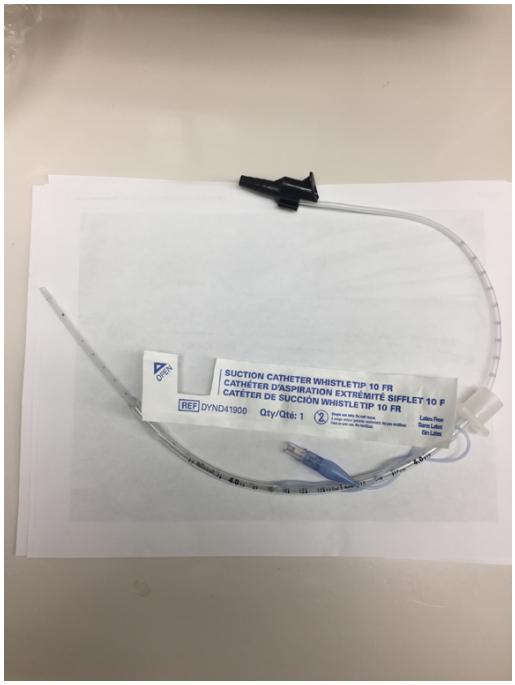

Figure 1. Size 10 Fr suction catheter threaded through a size 4.0 endotracheal tube.

2. The Technique

After induction of general anesthesia, the nares are prepped with a topical vasoconstrictor. The soft suction catheter is advanced through the ET tube and, as a secondary benefit, facilitates the passage of the endotracheal tube through the nasal fossa. Direct laryngoscopy is performed, and once the vocal cords are adequately visualized, the soft suction catheter is guided past the vocal cords and into the trachea using the Magill forceps. The suction catheter is significantly more compliant than the ET tube which makes the advancement into the trachea significantly easier. The ET tube can then be advanced over the suction catheter under direct visualization with the laryngoscope. Once the tube has been advanced into the trachea, the soft suction catheter is pulled out and the endotracheal tube balloon is inflated.

There are several approaches to securing a nasotracheal airway. This simple adjustment is more reliable than blind NTI and has been proven a reliable option to establish a secure airway. Because the suction catheter is smaller and more malleable compared to the tip of the nasotracheal tube, it is therefore more easily maneuvered into the nares and trachea with less risk of airway trauma. This also eliminates the risk of nasotracheal tube balloon rupture by the Magill forceps.

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