

SHORT ARTICLE

Experience with Nasotracheal Intubation: Description of the Procedure and Outcomes

Wael Abdulla Sadaqa, Dina Abujaber

Department of Anaesthesia and Intensive Care, Faculty of Medicine, Al-Najah National University and Al-Najah National University Hospital, Nablus, Palestine.

Corresponding author: Dr. Wael A. Sadaqa Email: dr.sadaqa@gmail.com

Published: 20 July 2014

Ibnosina J Med BS 2014;6(4):185-188

Received: 25 December 2013

Accepted: 07 January 2014

This article is available from: <http://www.ijmbs.org>

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Abstract

Background: Maxillofacial surgical procedures often require nasotracheal intubation as an alternative method for achieving general anesthesia. The procedure for intubation involves achieving neuromuscular blockade followed by passing the endotracheal tube (ETT) into the trachea. **Objectives:** Our hypothesis was that the nasopharyngeal passage of the endotracheal tube can be facilitated by the finger of a sterile glove acting as a pathfinder. **Patients and Methods:** We performed a randomized controlled trial with blinded assessment of nasopharyngeal bleeding and contamination of the tip of the endotracheal tube. After the induction of anesthesia, the tip of the ETT was inserted into the finger of a sterile glove before the ETT was inserted into the more patent nostril. In the control group (n=40), the gloves finger was retrieved before nasopharyngeal passage was attempted with an endotracheal tube

(inner diameter: 7.0 mm). In the intervention group (n=40), the finger of a sterile glove was kept in position. The tip of the endotracheal tube is inserted into the gloves finger. Subsequently, the endotracheal tube was advanced under visual control to the oropharynx when the gloves finger was removed and intubation completed. **Results:** The pathfinder technique reduced the incidence ($p < 0.001$), and severity ($p = 0.001$) of bleeding, decreased tube contamination with blood and mucus ($p < 0.001$), and diminished postoperative nasal pain ($p = 0.035$). **Conclusion:** Our study results suggest that nasopharyngeal passage of the endotracheal tube can be facilitated by (a sterile gloves finger) acting as a pathfinder.

Key words: Maxillofacial surgery, Endotracheal intubation, Nasotracheal intubation, General anesthesia.

Introduction

Maxillofacial surgical procedures often require nasotracheal intubation as an alternative method for achieving general anesthesia (1). The procedure for intubation involves achieving neuromuscular blockade followed by passing the ETT into the trachea. However, endotracheal intubation can be a difficult procedure and may be complicated (2-5). The problems with nasal intubation, especially in children, include: epistaxis (which may be severe), partial turbinectomy, obstruction of the ETT by dislodged tissue, contamination of the ETT with blood or secretions and inadvertently performing a partial adenoidectomy as evidenced on occasion by finding a chunk of adenoid in the end of the endotracheal tube (6-8). Our hypothesis is that the nasopharyngeal passage of the endotracheal tube can be facilitated by the finger of a sterile glove acting as a pathfinder.

Patients and Methods

We performed a randomized controlled trial with blinded assessment of nasopharyngeal bleeding and contamination of the tip of the endotracheal tube.

The study was approved by the hospital's research committee and patients gave informed consent. Patients were undergoing elective oral surgery that required nasal intubation. All patients were ASA classification 1. They had no previous history of nasal diseases, including epistaxis or coagulation problems, and were not taking any medications. None of them had hypertension.

Standard anesthesia technique was used. Premedication was with Midazolam 0.1 mg/kg i.v. 20 minutes before surgery. Induction and maintenance was performed using combined Propofol 2.5 mg/kg, Fentanyl 2 mics/kg, Attracurium 0.4 mg/kg. Ventilation throughout anesthesia was provided by using Oxygen/Nitrous Oxide mixture.

After the induction of anesthesia, the tip of the ETT was inserted into the gloves finger before it was inserted into the nostril. No vasoconstrictor spray was used. In the control group (n=40), the gloves finger was retrieved before nasopharyngeal passage was attempted with an endotracheal tube (inner diameter:7.0 mm). While in

Table 1. The standard procedures for the proposed nasotracheal entubation adopted at Al Najah University Hospital Training Programs, Nablus, Palestine.

1. Afrin spray to bilateral nares about ten minutes prior to induction of anesthesia (7)
2. Have a finger of a sterile gloves size 7.5 or 8, as well as a Magill forceps on the clean intubation equipment area on your anesthesia machine ready to go.
3. Pre-oxygenate the patient well, then induce general anesthesia and paralyze the patient as per your routine.
4. Consider squirting some 2% Lidocaine jelly in both nares at the time of induction.
5. Insert the end of the nasal ETT in the gloves finger (Figure 1) and pass it through the nares.
6. When the end of the ETT is visualized in the oropharynx, grasp the gloves finger, gently tug it up and out of the mouth.
7. By the help of forceps catch the end of the ETT tube and insert it into the trachea.
8. Confirm placement (loss of phonation, breath sounds, end-tidal CO₂) and secure tube.



Figure 1. The gloves finger in situ on the top of the endotracheal tube before its insertion through the nares.

the intervention group (n=40), the gloves finger was kept in position. Then the tip of the endotracheal tube is inserted into the gloves finger. Subsequently, the endotracheal tube is advanced under visual control to the oropharynx. After the endotracheal tube was positioned in the oropharynx, the gloves finger is removed and intubation completed as usual. Six hours after surgery, we determined the patients' nasal pain. The ease of passing the tube through the nostril was noted. Once the tip of the tube had passed into the oropharynx, directly laryngoscopy was performed and the presence of blood in the pharynx was noted and was classified as either 1) blood absent 2) blood staining on the gloves finger 3) blood pooling on the posterior pharynx. The gloves finger was removed by a Magil forceps and the tube was then passed into the trachea under direct vision. Post-operative pain was evaluated using a 0-10 numerical pain rating scale; considering 0 is no pain, 1-4 is mild pain 4-7 is moderate pain and 8-10 is severe pain

Results

The pathfinder technique reduced the incidence ($p < 0.001$), and severity ($p = 0.001$) of bleeding, decreased tube contamination with blood and mucus ($p < 0.001$), and diminished postoperative nasal pain ($p = 0.035$).

Six hours after surgery, we determined the patients, nasal pain. The pathfinder technique reduced the incidence ($p < 0.001$), and severity ($p = 0.001$) of

bleeding, decreased tube contamination with blood and mucus ($p < 0.001$), and diminished postoperative nasal pain ($p = 0.035$).

Discussion

To avoid causing this damage, we recommend following the 8 steps described in Table 1. Nasal bleed has not yet been seen when using this technique. At Al-Najah National University Hospital, all residents are expected to use this method when performing nasotracheal intubation. No complications were recorded in our experience of over 2 years (unpublished). In addition, use of cocaine or phenylephrine/lignocaine for nasal fiberoptic intubation has been suggested to reduce pain and facilitate intubation. Predictably, identifying the more patent nostril before naso-tracheal intubation has been recommended and shown to be relevant to the perioperative complications of nasal intubation (12-14).

In conclusion, nasopharyngeal passage of an endotracheal tube can be facilitated by a sterile gloves finger (nasopharyngeal airway) covering and guiding the rigid tube tip. This technique is helpful in reducing the incidence and severity of nose bleeds and in minimizing contamination of the tip of the endotracheal tube with blood and mucus. Our experience described here lends supports to previous reports on the same (9).

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