

A Modified Nasotracheal Intubation Technique

Ajai Chandra¹, Anurag Garg^{2*}, VK Shankhyan¹ and Ratnesh Shukla²

¹Associate Professor, Department of Anaesthesiology, Critical Care and Pain Management, Army Hospital (R&R), New Delhi, India

²Assistant Professor, Department of Anaesthesiology, Critical Care and Pain Management, Army Hospital (R &R), New Delhi, India

***Corresponding Author:** Anurag Garg, Assistant Professor, Department of Anaesthesiology, Critical Care and Pain Management, Army Hospital (R and R), New Delhi, India.

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Abstract

Nasotracheal intubation (NTI) is the preferred way for airway control during anaesthesia for oral, maxillofacial and head-neck surgeries. In the “Conventional Technique”, after anaesthetising the patient (i.e. post induction) nasotracheal intubation entails initial blind passage of a tracheal tube via the nares followed by laryngoscopy-assisted passage through the glottis, with or without the aid of Magill forceps. However, this technique is associated to have high incidence of epistaxis, contamination of the tube tip with blood and mucus, pharyngeal bleeding and nasal pain postoperatively [3]. Application of Magill forceps to guide the ETT (Endotracheal tube) into the trachea invariably leads to damage to ETT cuff or pharyngeal mucosa [4]. We speculated on minimizing nasopharyngeal trauma by modifying the conventional Nasotracheal intubation method by using silicon flexible nasopharyngeal airway (NPA) as a sleeve to protect nasal mucous membranes and intubating trachea with a flexometallic tube by nasal route by railroading it over the bougie.

The advantages of this modification are that it causes less nasopharyngeal trauma as well as less contamination of endotracheal tube. The NPA traverses the nasopharynx atraumatically leading to less postoperative throat pain. Moreover, the chances of accidental damage to the ETT cuff by Magill forceps in conventional method are reduced.

Keywords: Nasotracheal Intubation; Gumelastic Bougie; Nasopharyngeal Airway

Abbreviations

NTI: Nasotracheal Intubation; ETT: Endotracheal Intubation; NPA: Nasopharyngeal Airway; ICU: Intensive Care Unit

Introduction

Nasotracheal intubation (NTI) is the preferred way for airway control during anaesthesia for oral, maxillofacial and head-neck surgeries since it allows the tracheal tube to pass through nose thus allowing better isolation and good surgical access for intraoral procedures [1]. Kuhn first described nasal intubation technique in 1902. During the World War I, Rowbotham and Magill developed the technique of “blind” nasal intubation. It was popularized by Magill in 1920’s, especially in ICUs (Intensive care unit) for long-term ventilation, but carried the risk of sinusitis.

Now a days, Nasotracheal intubation is used in the operating room for dental procedures and intraoral (e.g., mandibular reconstructive procedures or mandibular osteotomies, maxillofacial and oropharyngeal) surgeries. Other indications include cervical spine instability or severe degenerative cervical spine, intraoral mass lesions or limited mouth opening (e.g. trismus).

Suspected epiglottitis; Midface instability; Coagulopathy and Suspected basilar skull fractures are absolute contraindications to nasotracheal intubation, while it should be better avoided in epistaxis or large nasal polyps or cases of prosthetic heart valves (due to increased risk of bacteremia during insertion).

Conventional technique

In the “Conventional Technique”, after anaesthetising the patient (i.e. post induction) nasotracheal intubation entails initial blind passage of a tracheal tube via the nares followed by laryngoscopy-assisted passage through the glottis, with or without the aid of Magill forceps. However, this technique is associated with high incidence of epistaxis due to high vascularity of the nasal mucosa which gets damaged during tube insertion and impaction of foreign objects into the tube [2]. The other complications of this technique are contamination of the tube tip with blood and mucus, tearing or injury of nasal mucous membranes and even of a turbinate leading to retropharyngeal abscess, pharyngeal bleeding and nasal pain postoperatively [3]. Application of Magill forceps while guiding the ETT into the trachea usually damages the ETT cuff or pharyngeal mucosa [4].

Modifications

A number of modifications to the above technique have been carried out by various experts, each one with its own pros and cons. The popular ones being Fiberoptic nasal intubation, Stylet-facilitated nasotracheal intubation, Endotrol ETT with a light wand, Dual bougie technique, NTI with Bonfils retromolar fiberscope, NTI in sitting position and Blind nasal intubation aided with inflated tracheal cuff in the oropharynx to help guide the tip of ETT into the trachea [5]. Out of all these, Fiberoptic nasal intubation is the Gold standard now a days however, still in some parts of the world availability of Fiberoptic scope is not common in all setups. For these kind of settings, technique of nasotracheal intubation over a bougie, shows a significant decrease in both the incidence and severity of nasal trauma [6,7] and complications mentioned above [6,7]. We modified the technique of Nasotracheal intubation keeping in view, the above concerns.

Our technique

In our modification of the conventional technique, we speculated on minimizing nasopharyngeal trauma and avoid ETT contamination.

Step 1: An appropriate sized silicon flexible nasopharyngeal airway (NPA) is placed in wider nostril, after spraying it with 0.05% Oxymetazoline, to protect nasal mucous membranes. NPA acts like a sleeve and as a pathfinder in the nasal conduit. Lidocaine 2% gel is applied generously on outer surface to give lubrication and reduce postoperative nasal pain (Figure 1A).

Step 2: Then a Gum elastic bougie is passed through the NPA (Figure 1B).

Step 3: Tip of bougie is guided into the trachea with the help of Magill forceps as in conventional method (Figure 1C).

Step 4: The NPA is removed and flexometallic ETT is railroaded over the bougie (Figure 1D).

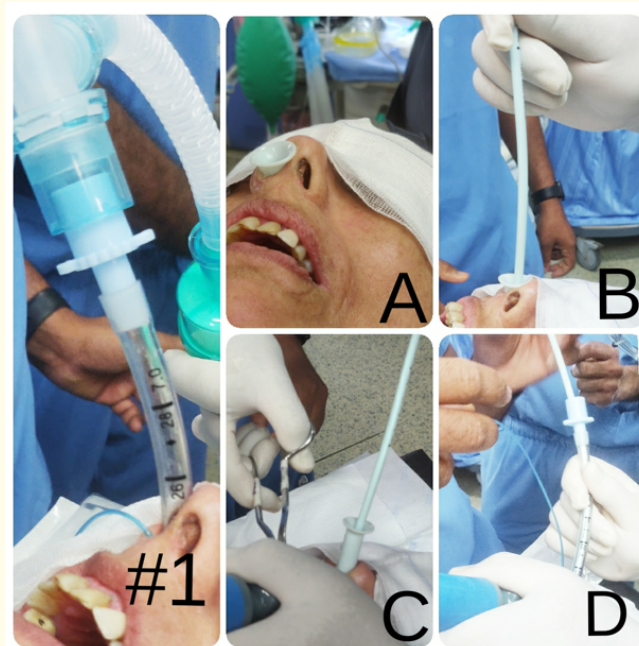


Figure 1: Modified nasotracheal intubation technique.

Legend: #1: Endotracheal tube placed via nasal route.

A: Placement of well lubricated Nasopharyngeal Airway (NPA). B: Passing Gum elastic bougie through NPA into pharynx.

C: Manipulation of bougie into Laryngeal inlet with the help of Magill's forceps and Laryngoscope. D: Railroaded ETT over the bougie into trachea.

The advantages of this modification can be:

- The NPA traverses the nasopharynx atraumatically and finds the best possible way to the oropharynx, typically along the floor of the nasal cavity.
- The bougie guides the nasotracheal tube through narrow nasal passages, small pharyngeal spaces, and acute laryngeal approach angles, without any transoral manipulation of the tube.
- The damage to the ETT cuff by magill forceps is avoided.
- The technique is easy to perform, uses a routine skill set, and can be advantageous especially in resource depleted settings where fibre optic scopes are not available.

Conclusion

Nasotracheal intubation is an effective and safe technique especially in the head and neck surgeries and cases with difficult or reduced mouth opening. Fibre optic scope is required in modern setup for safe Nasal Intubation. But the procedure is expensive in terms of time and equipment required.

With our modified technique, careful intubation with the aid of basic equipment like Magill forceps or NPA and Bougie, provides a quick and relatively safe alternative in a resource limited setting.

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Conflicts of Interest

There are no conflicts of interest.

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