Editorial Commentary

Nasal airway: an old but easy and effective guide to nasotracheal intubation

Jae Gyok Song, Sung Mi Ji, Min A. Kwon

Department of Anesthesia and Pain Medicine, Dankook University Hospital, Cheonan, Korea

Correspondence to: Min A Kwon. Department of Anesthesia and Pain Medicine, Dankook University Hospital, Cheonan, Korea.

Email: mmauss73@gmail.com.

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Nasotracheal intubation is preferred for oral and maxillofacial surgery due to its wide field of view and surgical convenience. It causes much more tissue injury than oral intubation due to the anatomical complexity, structural variation of the nasal passage and the blindness of the procedure (1). Even for experienced doctors, the incidence of bleeding reaches 18–77% (2).

The nasal pathway is divided into an upper pathway between the middle turbinate and inferior turbinate and a lower pathway between the inferior turbinate and the nasal floor (3). If a tube is installed in one route, it is likely that movement of the tube to the other route is prevented by the medial border of the inferior turbinate. The middle turbinate has abundant blood vessels and is also connected to the skull base. The injury in middle turbinate may be dangerous because it can lead to severe bleeding and fracture in skull base during traumatic procedures. Therefore, the lower pathway far from middle turbinate is recognized as a relatively safe route for nasotracheal intubation (3).

To date, the safe and effective methods of nasotracheal intubation are to increase the nasal cavity space by reducing the volume of mucosa tissue as much as possible, reduce the size of the passing endotracheal tube appropriately, and to pass through the safer lower pathway (2).

Various traditional methods of lubricating, increasing flexibility by thermo-softening (4), and the use of vasoconstrictors (5) are still effective and widely used. The actual effect of reducing the tube size is controversial. It has been reported that a reinforced tube with a larger outer diameter caused less epistaxis than a preformed nasal tube (3). Moreover, when the size of the tube decreases, the overall length of tube also shortens. Careful consideration should be needed (4).

In a study comparing the effects of various endotracheal tubes (3), it was reported that the reinforced tube entered the lower pathway much more effectively than other preformed polyvinyl chloride (PVC) tubes (56.7% in reinforced tube *vs.* 16.7% in preformed tube and 20% in thermo-softened preformed tube). However, even for reinforced tubes, anatomical variations are common and the entry rate into the lower pathway is only about 55%, so the use of guiding devices such as fiberoptic bronchoscopes is increasing. A fiberoptic bronchoscope can be used to avoid anatomical variations and to promote entry into the relatively safe area between the inferior turbinate and the nasal floor (1,6). Furthermore, it can help choosing a suitable nostril (6).

The recent issue of *Journal of Oral and Maxillofacial Surgery* included the clinical study "*Does a Nasal Airway Facilitate Nasotracheal Intubation or Not? A Prospective, Randomized, and Controlled Study*" (7) by Canpolat and Orbay Yasli, which investigated that the use of nasopharyngeal airway just before the nasotracheal intubation enhanced the success rate of nasotracheal intubation and effectively shortened the time of intubation. There has been study that it was effective to dilate the nasal cavity by inserting the nasopharyngeal airway from a small size to a gradually larger size several times (2). However, there was a concern that several airway insertions into the fragile nasal mucosa could promote bleeding. In this study, the authors also used the dilating effect by leaving the nasopharyngeal airway in place during mask ventilation and removing it

just before intubation. Nostril and nasotracheal tube were lubricated with lidocaine jelly and packed with Bosmin for vasoconstriction during mask ventilation. Although the size of the nasopharyngeal airway was not specified, considering that it was for dilation of the nasal cavity just before intubation, a nasopharyngeal airway with the similar size as the inner diameter of the endotracheal tube would have been used. Unlike other studies that it reduced the occurrence of epistaxis, this study did not reveal the reduced occurrence of epistaxis. However, the entry of the tracheal tube following the dilated route by the nasal airway was much easier and completed quickly.

In this study, the authors used a preformed tube designed at 45° inclined and convex in the distal part. The preformed PVC tube has a significantly higher risk of epistaxis than the reinforced tube because the tip design is convex and is more likely to be induced into the upper nasal pathway (3). However, the success rate in the glottic phase is rather high because of the convex distal part. Although epistaxis was not reduced, higher success rate of intubation and shortened intubation time might be due to the use of a preformed nasal tube.

In this study, the authors described that the nasal airway had a preconditioning effect that opened a safe path and gave a dilating effect. However, it must be remembered that the nasopharyngeal airway also takes a blind technique and is a PVC device with convex contour, so although it has great flexibility, it cannot be said that there is a definite advantage of leading to a lower pathway as safe as a fiberoptic bronchoscope. If there is a risk such as skull fracture, it would be safe to use fiberoptic bronchoscope or do oral intubation. In other general cases, preconditioning of the nasopharyngeal airway along with lubricating and vasoconstricting may be a simple and effective method to facilitate mask ventilation and nasotracheal intubation. If there is a randomized prospective study using a fiberoptic bronchoscope on how much the nasopharyngeal airway enters the lower pathway, it will be an important basis to support the use of the nasopharyngeal airway in the future.

This promising finding highlights that despite potential disadvantages of a risk of epistaxis, nasal airway insertion before the nasotracheal intubation could be a helpful technique to facilitate the successful nasotracheal intubation. This study will hopefully motivate researchers to investigate the potential of nasopharyngeal airway in popular use in nasotracheal intubation and to address how to reduce the rate of epistaxis in various intubation settings.

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