

Reviewer #1:

Title- write the type of study at the end of the title. Like - Comparison of cuff pressure between TaperGuard nasal endotracheal tube and conventional nasal endotracheal tube after extension of head and neck: A randomized controlled trial

Response:

Comparison of cuff pressure between TaperGuard nasal endotracheal tube and conventional nasal endotracheal tube after extension of head and neck: **A randomized controlled trial**

Introduction Elaborate the hypothesis in detail.

Response:

The cuff pressure of ET can be affected by positional change during surgery[10-12]. **When the cephalad migration of ET occurs, the intracuff volume can be compressed at a narrower and less compliant airway space such as at level of cricoid cartilage, leading to increased cuff pressure. [13,14]. It was demonstrated that** the increase of cuff pressure was greatly higher in the tapered cuff than in the cylindrical cuff after positional changes such as supine with lateral rotation of head and lateral frank position in orally intubated patients[13,14]. After rotation of head, the degree of cephalad migration of ET was significantly higher in the tapered cuff than in the cylindrical cuff during oral endotracheal intubation[14]. **Oral surgery often requires nasal endotracheal intubation and supine position with head and neck extension to facilitate surgery, which can displace ET toward vocal cord[10]. However, there are only a few studies investigating the cuff pressure change and the degree of migration of ET following anterior-posterior movement during nasal endotracheal intubation.** Therefore, this study was designed to compare the cuff pressure between nasal TaperGuard ET and nasal conventional ET after extension of head and neck during oral surgery. In addition, the distance from the carina to the tip of tube after extension of head and neck was compared and postoperative airway complications such as sore throat, and hoarseness were assessed.

Discussion Therefore, when inflated in the trachea, more longitudinal folds developed in the

cylindrical cuff than in the cylindrical cuff, leading to a significant prevention of microaspiration and pneumonia with TaperGuard ET, compared with conventional ET [8,16,17]. Rewrite it.

Response:

Therefore, when inflated in the trachea, longitudinal folds or channels are made on the surface of cuff, leading to microaspiration and pneumonia [8,15]. The cuff of newly developed TaperGuard ET is distally tapered, which fits into tracheal diameter somewhere in the length when inflated in the trachea, leading to improving sealing effect [16,17].

The cephalad migration of ET occurs after extension of head and neck during orally or nasally endotracheal intubation [10,11]. Rewrite it – it will be oral or nasal endotracheal intubation.

Response:

The cephalad migration of ET occurs after extension of head and neck during oral or nasal endotracheal intubation [10].

Mention the implications of the study Mention the direction for future research

Response:

However, it was difficult to clarify the relationship between the shape of ET cuff and airway complications due to small sample size. Therefore, further study is required to investigate the association between the shape of ET cuff and postoperative airway morbidity.

Conclusion What you want to recommend from the study.

Response:

This study suggests that cuff pressure should be monitored after positional change, particularly in when using TaperGuard ET during nasal endotracheal intubation.

Reviewer #2:

1. The necessity and hypothesis of this study should be mentioned in the Introduction.

Response:

When the cephalad migration of ET occurs, the intracuff volume can be compressed at a narrower and less compliant airway space such as at level of cricoid cartilage, leading to increased cuff pressure. [13,14]. It was demonstrated that the increase of cuff pressure was greatly higher in the tapered cuff than in the cylindrical cuff after positional changes such as supine with lateral rotation of head and lateral frank position in orally intubated patients[13,14]. After rotation of head, the degree of cephalad migration of ET was significantly higher in the tapered cuff than in the cylindrical cuff during oral endotracheal intubation[14]. Oral surgery often requires nasal endotracheal intubation and supine position with head and neck extension to facilitate surgery, which can displace ET toward vocal cord[10]. However, there are only a few studies investigating the cuff pressure change and the degree of migration of ET following anterior-posterior movement during nasal endotracheal intubation. Therefore, this study was designed to compare the cuff pressure between nasal TaperGuard ET and nasal conventional ET after extension of head and neck during oral surgery. In addition, the distance from the carina to the tip of tube after extension of head and neck was compared and postoperative airway complications such as sore throat, and hoarseness were assessed.

2. The authors should give a concise explanation about American Society of Anesthesiologists physical status classification I-III.

Response:

American Society of Anesthesiologists (ASA) physical status I (a normal healthy patient), II (a patient with mild systemic disease) III (a patient with severe systemic disease).

3. The endotracheal tubes with different cuffs should be given as images.

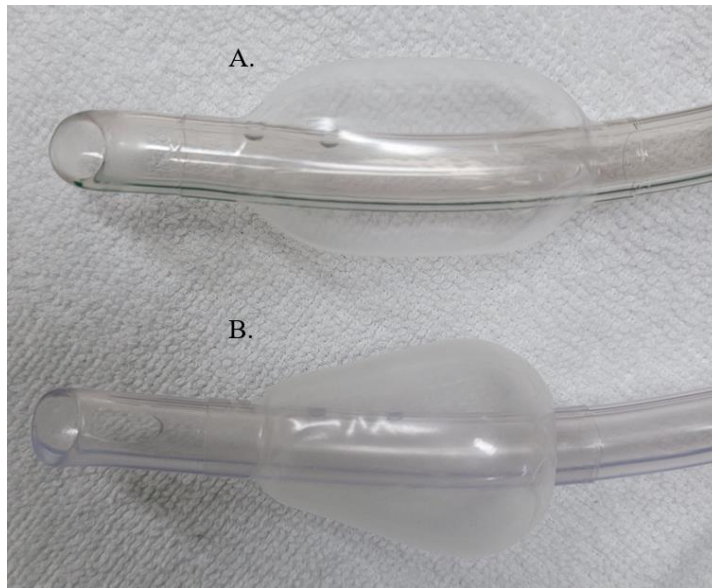


Fig 1. Cuff shape. A. Conventional endotracheal tube. B. TaperGuard endotracheal tube

4. The status of nasal conventional ET and TaperGuard ET should also be described using diagrams.

Response:

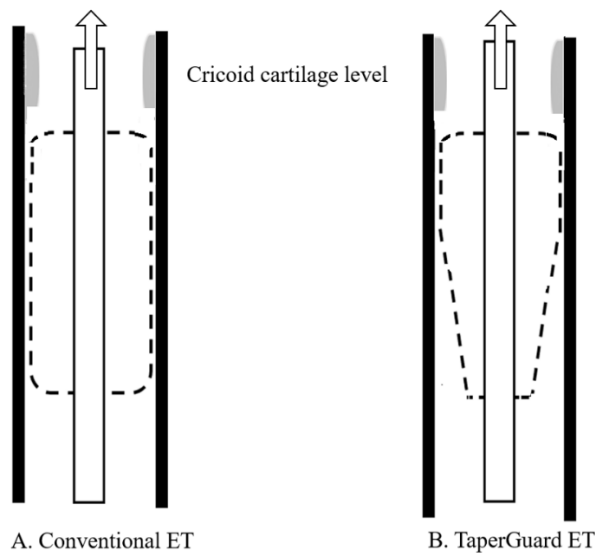


Figure 3. Cuff inflation of endotracheal tube (ET) in the trachea. The TaperGuard ET with a tapered cuff has smaller cuff volume and narrower tracheal contact than conventional ET. When the intracuff volume are compressed at a narrower and less compliant airway space such as at level of cricoid cartilage, the increase in cuff pressure is significantly higher in the

TaperGuard ET than in the conventional ET.

5. The paragraph “A pilot study...” should be listed under Statistical analysis section.

Response: “A pilot study...” was listed under Statistical analysis.

6. The sentence “This study was approved...” should be transferred to the last of the paragraph. And the designing and the place of this present study should be involved at the first of this paragraph.

Response: The sentence “This study was approved...” was transferred to the last of paragraph.

7. Why was the student’s t test used? Please gave some explanations.

Response:

Student’s *t* test was used for analysis of continuous data such as cuff pressure and distance from the carina to tube tip. Fisher’s exact test or chi-squared test was used for analysis of categorial data sch as postoperative airway complications and the incidence of cuff pressure more than 30 cmH₂O.

8. The relevant mechanisms were not very clear. Please gave more explanations.

Response:

The trachea is not cylindrical and is surrounded by C shaped cartilage joined by a thin connective tissue. The tips of the C-shaped cartilages are closer to each other in the cranial region than in the caudal region of the trachea and the tracheal compliance is higher in the cranial region than in the caudal region[20, 21]. In addition, the subglottic space at level of cricoid cartilage is the narrowest[22]. Boyle's law is a gag law stating that the pressure of a gas is inversely proportional to volume at constant temperature within a closed system. When ET migrates toward vocal cord and the cuff is placed adjacent to narrower and less complaint upper airway structure such as cricoid cartilage, the cuff volume is compressed, leading to cuff pressure increment according to Boyles’ law [13,14] (Fig 3.). In the recent study, the cuff pressure was significantly higher in the TaperGuard ET than in the conventional ET after changing

from the supine to the lateral flank position, although the degree of cephalad migration of ET was comparable between two groups [13]. The TaperGuard ET with a tapered cuff has smaller cuff volume and narrower tracheal contact than conventional ET. Therefore, it was suggested that the geometric difference of ET cuff can account for the difference in the cuff pressure increment between two groups [13] (Fig 3). In the recent study, it was found that TaperGuard ET significantly moved toward vocal cord, compared to cylindrical cuff after head rotation during oral endotracheal intubation, which could be in part responsible for the difference of the cuff pressure between two groups [14]. In the present study, the increase of cuff pressure was significantly higher in the TaperGuard ET in the conventional ET after extension of head and neck during nasal endotracheal intubation. In addition, the degree of cephalad migration of ET was significantly greater in the TaperGuard group than in the conventional group.