



A Simple Method to Reduce the Insecurity of Endotracheal Tube in Pediatric Spinal Surgeries

Yingzhe Yan*, Haojie Yang*, Minghui Cao and Fengtao Ji*

Department of Anesthesiology, Sun Yat-Sen Memorial Hospital, P.R. China

*These authors contributed equally to this work

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Letter to the Editor

A wide range of pediatric spinal diseases, most commonly scoliosis, followed by neuromuscular spinal disorder, infection, trauma and tumor, need surgical interventions. These surgeries are performed in prone position and usually last for more than 4 h with endotracheal intubated. Unfortunately, position adjustment and prolonged procedure are both risk factors of Unexpected Intraoperative Extubations (UIEs) which is a potentially morbid anesthetic event and one of the leading causes of airway-related complications. Studies have shown that UIEs occurrence is inversely related to age [1]. We are aware of 2 possible causes: First, children tend to drool a lot more than adults in prone position, which make it easier to dampen the securing tapes. And then, bite blocks are more susceptible to slip out of mouths in children between the age of 6 to 12 because of the secretions and lack of teeth.

Previous reported methods applied in this situation include a custom-designed prone position tube which added a fixed device on the traditional ETT with one hole on each side to tie a connecting cord around a patient's neck [2]. Another method applied a tube-holding device, e.g., Thomas tube holder, which reduces the risk of displacement of ETTs [3]. However, both studies mentioned above were conducted on adult patients and required extra devices. Thomas tube holder is also so hard that may increase the risk of skin excoriations. Studies were also performed to compare different brands of tapes, for example, Durapore® (adhesive non-extensive tape) and Multipore® (adhesive extensive tape), whereas none of which is more effective than Thomas tube holder in security [4]. The nasal route for intubation was an alternative several decades ago. However, many clinicians today do not prefer it because of the complications, such as sinusitis, nasal structure destruction, and local abscesses [5]. Additionally, children require more oxygenation during the lengthy surgery while narrow tubes may hinder this supply and delay the salvage in emergencies.

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*Correspondence:

Fengtao Ji, Department of Anesthesiology, Sun Yat-Sen Memorial Hospital, No. 107 Yan Jiang West Road, Guangzhou 510120, P.R. China

Tel: +8613631458420;

E-mail: jift@mail.sysu.edu.cn

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Figure 1: The arrangement of the roll of gauze and endotracheal tube in bottom-up view. Both endotracheal tube and a properly sized roll of gauze are placed between the upper and lower teeth, and then they are immobilized by adhesive tape. a) Without foam headset; b) With foam headset.

*: Endotracheal tube, O: Roll of gauze

block with a roll of gauze. The diameter of the roll is prepared to fit the hole in the middle of the foam headrest or about the same size as the bite block so that it can come through the hole with the ETT. After the intubation is confirmed successful, the roll is placed just beneath the ETT with half inside the mouth. The adhesive tape then wraps and secures both the roll and the tube together (Figure 1). In this case, the roll of gauze acts as drainage of salivation, and thus protects the adhesive sides of the tape from being dampened. After applying this method, the dislodgment of endotracheal tube in pediatric spinal surgeries has not been observed in our clinical practice.

This method hardly requires additional instruments or cost and is easy to perform, so it can be used in all standard operation rooms. We hope this slight alteration can make our contributions to provide high-risk pediatric patients better care in their major surgeries.

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