

Guide Wire J-Tip Technique for Easy Exchange of *In Situ* Endotracheal Tubes

Dear Editor,

Endotracheal intubation (ETI) is a simple, rapid, safe and non-surgical technique for airway management. It maintains airway patency, protects the lungs from aspiration, and permits leak-free ventilation during mechanical ventilation. The anesthesiologists' knowledge, technical skills and crisis management capabilities play an important role in controlling the occurrence of unwanted complications during airway management.¹ In anesthesiology, leaking cuff is one of the problems occurring after correct endotracheal intubation. It usually occurs when the cuff is damaged by contact with teeth, nasal bone or Magill forceps during mechanical ventilation in which the tracheal tube should be removed and replaced. In patients with impossible manipulation of the neck, injuries to the cervical vertebrae of their neck, or difficult intubation, it is necessary to use a fiberoptic bronchoscope for reintubation most of the times. Direct laryngoscope with Macintosh blade for intubation is the first selection in cases of difficult intubation.² Using laryngoscope produces reflex sympathetic stimulation, and subsequently increases heart rate, blood pressure, intracranial pressure, myocardial ischemia, and cardiac arrhythmia. Complications of airway problems often result in morbidity and mortality in anesthesia.¹ Inadequate cuff seal is common and leads to hypoventilation during mechanical ventilation and aspiration of gastric contents.

The most common cause of reintubation during anesthesia in the operating room is upper airway obstruction and hypoventilation. Endotracheal tube cuff laceration during anesthesia is often associated with respiratory complications, reduction of arterial haemoglobin oxygen saturation, and inappropriate ventilation of the lungs. Therefore, the exchange of endotracheal tube and proper replacement with an adequate tube plays an important role. Care must be taken to reduce neck manipulation, minimize use of laryngoscopy, and cause less sympathetic stimulation. Guide wire "j" tip catheter, which is a central venous catheter, is suggested for the exchange of a tracheal tube during anesthesia without using fiberoptic bronchoscope or laryngoscopy (figure 1).



Figure 1: Guide wire «j» tip used for changing the tracheal tube.

To exchange a tracheal tube during anesthesia in operating room without using fiberoptic bronchoscope or laryngoscopy, a flexible guide wire "j" tip is inserted into the previously perforated tube and the damaged tube is removed. Guide wire "j" tip remains in place, and a new tube is advanced over the guide wire "j" tip, and is correctly placed at the expected point. Then, guide wire "j" tip is removed slowly. After the evaluation of the lungs and ensuring adequate ventilation, the new tube is fixed with desired instruments. During the exchange and replacement of tracheal tube, hemodynamic parameters including, electrocardiogram monitoring, blood pressure, and hemoglobin oxygen saturation are protected and controlled continually (figure 2).

Proper management of airway disorders and dealing with patients with difficult intubation is one of the problems, which an anesthesiologist experiences in the operation room. One of the common causes of endotracheal tube exchange for the patients in the operating rooms and intensive care units is tearing and laceration of endotracheal tube cuff. The use of different instruments to guide tracheal tube to make endotracheal tube exchange easy with no side effects in patients was described in 1981. Different techniques have suggested

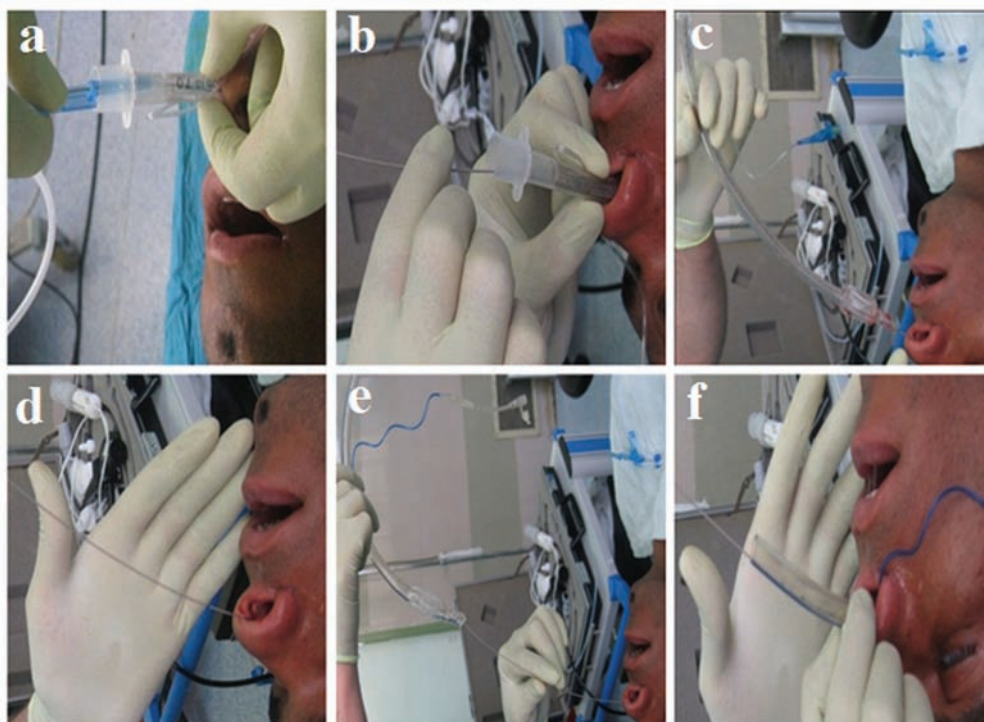


Figure 2: Stages of change and replacement of the tracheal tube.

the use of varied instruments such as suction catheter, urethral catheter, fiberoptic bronchoscopy,^{3,4} stylet,⁵ endotracheal tube changer-guide, gum-elastic bougie,⁶ cook airway exchange catheter,⁷ and endotracheal tube exchange.⁸ Advantages and disadvantages of each technique should be investigated.

In guide wire "j" technique, the tip of the wire is used for exchanging endotracheal tube without using fiberoptic bronchoscopy or causing harmful manipulation of neck. Advantages of this technique include availability of this instrument, simplicity of its use, and minimization the risk of serious hemodynamic complications. However, this technique may encounter two problems including the twisting of J-wire inside the endotracheal tube, and the obstruction of old tube by clot or mucous plaque, which should be cleared by suctioning before replacing the old tube with a new one. In adult patients, who are under artificial ventilation in intensive care units who have morbid obesity (BMI>35), facial-neck abscesses, massive head and neck edema, and cervical motion restriction, which make direct vision of the airway and vocal cord, and tracheal reintubation impossible, the use of simple flexible-guide wire "j" tip technique as a guide for exchanging endotracheal tube in is suggested.

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References

- 1 Divatia J.V, Bhowmick K. Complications of endotracheal intubation and other airway management

- procedures. *Indian J Anaesth.* 2005;49:308-18.
- 2 McIntyre JW. Laryngoscope design and the difficult adult tracheal intubation. *Can J Anaesth.* 1989;36:94-8. doi: 10.1007/BF03010896. PubMed PMID: 2644052.
- 3 Craker L, Allan B, Lim M. Introducer catheter for fiberoptic intubation does exist. *Anesth Analg.* 2006;102:329-30. doi: 10.1213/01.ANE.0000190720.32148.51. PubMed PMID: 16368858.
- 4 Rosenbaum SH, Rosenbaum LM, Cole RP, Askanazi J, Hyman AI. Use of the flexible fiberoptic bronchoscope to change endotracheal tubes in critically ill patients. *Anesthesiology.* 1981;54:169-70. PubMed PMID: 7469094.
- 5 Bedger RC Jr, Chang JL. A jet-stylet endotracheal catheter for difficult airway management. *Anesthesiology.* 1987;66:221-3. doi: 10.1097/00000542-198702000-00019. PubMed PMID: 3813082.
- 6 Braude D, Ronan D, Weiss S, Boivin M, Gerstein N. Comparison of available gum-elastic bougies. *Am J Emerg Med.* 2009;27:266-70. PubMed PMID: 19328368.
- 7 Moyers G, McDougale L. Use of the cook airway exchange catheter in "bridging" the potentially difficult extubation: a case report. *AANA J.* 2002;70:275-8. PubMed PMID: 12242925.
- 8 Benumof JL. Airway exchange catheters: simple concept, potentially great danger. *Anesthesiology.* 1999;91:342-4. PubMed PMID: 10443594.