

Retrograde tracheal intubation using a guidewire for a difficult airway in a patient with severe facial burns

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Abstract

A technique of retrograde tracheal intubation is disclosed which employs a 7 Frx20cm central venous cannulation J-guidewire (from BIOMETRIX critical care solutions). The guidewire was inserted through the cricothyroid membrane and retrieved orally. An endotracheal tube was then passed over the guidewire under direct laryngoscopy.

Keywords: intubation, orotracheal, retrograde

Introduction

The establishment of an adequate airway is a critical step in the resuscitation of a seriously ill or injured patient. Orotracheal intubation is the preferred method for establishing an adequate airway in these circumstances.

Tracheal intubation in patients with difficult airway requires superior skills and implementation of special intubation techniques. One of these techniques demonstrated in this case report is the use of a retrograde percutaneous guidewire tracheal intubation. Retrograde intubation, first described by Butler and Cirillo in 1960, is often used effectively in the most difficult of intubations.^[1] This technique in airway management by percutaneous guidewire endotracheal intubation will help immensely in improving airway management associated with adverse complications and outcomes.

In this case report we describe the airway management for a 49-year old epileptic and mentally retarded female patient who presented to our A & E department with severe facial burns, burns of both arms (circumferential right arm and left arm partial and full thickness burns), right breast and chest burns following accidental exposure to a household cooking fire.

Technique

The technique consists of a method and apparatus for a retrograde endotracheal intubation by employing a percutaneous (using a 7 French, 60 cm central venous cannulation J- tip guidewire) insertion via a hollow needle through the trachea.

A small dose of Propofol 100 mg I.V was administered in order to put the patient to rest followed by a dose of 100 mg I.V of Suxamethonium.

A 7 French central venous cannulation finding needle (18 gauge) with a syringe loaded with 3 ml of normal saline was used to puncture the cricothyroid membrane (CTM) at 30-degree angle towards the cephalad direction coupled with frequent gentle aspiration. Once the trachea was accessed, which was noticed by air aspiration and bubbling of normal saline in the syringe, the needle stylet was removed and a guidewire inserted through the finding needle catheter until it appeared in the oropharynx. A handheld forceps was used in grasping the end of the J-guidewire from the oropharynx. A 7.0 mm PROTEXT® endotracheal tube (ETT) was then passed over the J-guidewire under direct laryngoscopy and advanced gently down to the trachea. The entry and the route of the guidewire is illustrated in Figure 1.

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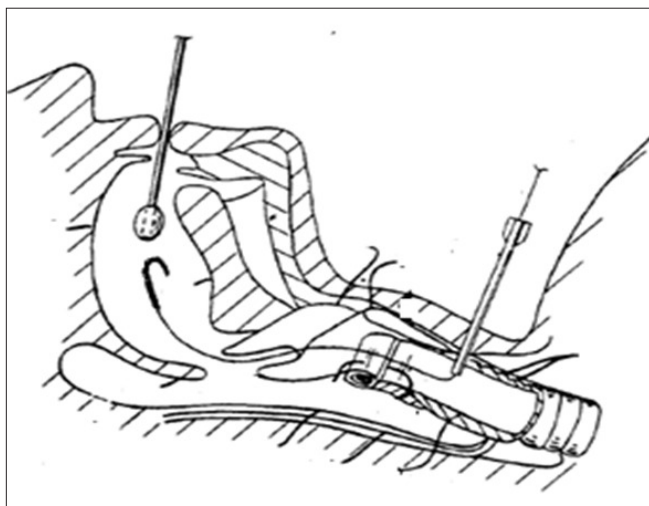


Figure 1. Entry and the route of the guidewire

Direct laryngoscopy also eliminates difficulties associated with blind advancement of an endotracheal tube over a guidewire, including trauma to soft tissues or entrapment of the tube in the pyriform fossa or vallecula. The possibility of complications associated with puncture of the CTM appears to be remote.^[2]

The guidewire was then removed and the tube secured in place - see Figure 2. Correct placement of the ETT was confirmed by auscultation of bilateral breath sounds in the usual manner.

Discussion

Retrograde tracheal intubation has been used successfully in difficult airway scenarios and, in all cases, it facilitated the administration of oxygen to patients requiring mechanical ventilation prior to administration of anaesthesia or admission to intensive care units (ICUs). It is especially practicable in cases in which a difficult airway is anticipated.

The technique is simple, atraumatic, and does not add complications of its own although the risk of complications is relative and vary with the experience of performing the technique. One of the complications attributable to retrograde intubation was a small peri-tracheal hematoma in one patient that required no treatment. Akinyemi et al.^[3] in reviewing complications of retrograde intubation



Figure 2. The tube was secured in place

in their series of 12 patients reported external bleeding of minor significance in three patients with breath holding and with respiratory obstruction in one each. Some other complications might be anticipated such as the ETT can be caught in the glottic opening when loading the ETT over the wire which might cause bending of the guidewire.

This technique also eliminates the necessity of tracheostomy tube insertion in patients where tracheal intubation is difficult.

Conclusion

This technique of retrograde intubation is not only safe, but can be easily performed by one anaesthesiologist without the need for a team of surgeons and bronchoscopists.

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