

Restricted Cervical Spine: An Anaesthetic Challenge

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Abstract: Failure to successfully intubate the trachea and secure the airway in a timely and effective manner remains a leading cause of mortality and morbidity. When airway management is difficult, various measures can be taken to facilitate tracheal intubation. Simple maneuvers like Bougie-assisted blind tracheal intubation are reasonable strategy for controlling the airway in patients who have restricted cervical spine movements.

Keywords: Bougie, intubation, restricted neck

INTRODUCTION

Conventional laryngoscopy and tracheal intubation is still considered to be the gold standard of airway management [1]. This technique requires an optimal sniffing position and alignment of the oral, pharyngeal and tracheal axes. Inability to achieve this in patients with restricted neck movements may cause difficulty in visualising the larynx. Persistent and repeated use of direct laryngoscopy during failed intubation may result in airway trauma with resultant morbidity and mortality [2]. Certain newer airway devices are presently available and have been used to facilitate airway management in patients with restricted neck movements. Bougie-assisted blind tracheal intubation may be a viable rescue intubation technique in "can mask-ventilate" patients with difficult laryngoscopy secondary to blood, vomitus, abnormal anatomy, or equipment problems. This technique offers a potential solution for difficult intubation situations occurring in or out of the operating room by any practitioner trained in advanced airway management.

CASE REPORT

23 year old female presented for emergency breast abscess drainage. Patient was planned to undergo the surgery under general anaesthesia as she was full stomach and had taken meal 2 hours back. Quick preoperative assessment revealed restricted cervical spine movements and airway indices to be abnormal. Sternomental distance was 11.2 cms and neck length

was 6.5 cm. According to 3-3-2 rule, Interincisor distance was 2^{1/2} fingers, Mentohyoid was 2^{1/2} fingers and Thyromental distance was 1 finger breadth only. Neck extension was only about 30-35 degrees (Fig. 1). High risk consent was obtained. Patient was premedicated and induced with Injection Propofol 2 mg/kg. Cricoid pressure was applied and check ventilation was performed. Ventilation was quite smooth after insertion of appropriate oral airway. We planned to insert 7.5 mm Endotracheal tube with stylet after administration of Injection succinylcholine (2 mg/kg). As anticipated, on entering the oral cavity laryngoscopic view was Cormack Lehane grade IV. We could only visualize palate and immediately we entered oral cavity through a bougie. Blind bougie insertion into laryngeal cavity was done and quickly 7.0 mm endotracheal tube was threaded over it. To our relief, we were able to perform endotracheal intubation accurately. Cricoid pressure was relieved on confirming tube placement.

DISCUSSION

Immobilized cervical spine because of certain diseases (ankylosing spondylitis, rheumatoid arthritis) poses considerable difficulties with endotracheal intubation due to poor laryngoscopic view. Cervical column and atlantooccipital articulation mobility are reduced and in severe cases the cervical vertebrae become fixed in a flexed position. This portion of the spine is also the most susceptible to fracture,

particularly in hyperextension, an event that could lead to damage to the cervical spinal cord during maneuvers to manage the airway.

The left molar (LM) approach has been shown to be useful in difficult sporadic intubation cases [3]. LMA has been utilized in restricted cervical spine airway scenarios as an aid to endotracheal tube [4].



Fig. 1: Neck extension was only about 30-35 degrees

For cooperative patients and when the clinical situation allows, there may be time to recruit further resources and hence alternative options for achieving a secure airway, including awake intubation and fiberoptic techniques [5-7]. Adults requiring immediate airway control in the ED will limit these options. The use of fiberoptic guided intubation in the ED is generally not feasible because of availability of fiberoptic equipment in emergent situations and practitioners experienced in its use.

The LMA has proven usefulness as an airway in fasting patients undergoing anaesthesia but its role in management of the difficult airway and the traumatic airway is still evolving. The LMA does not protect against aspiration [8] and cannot be recommended for first line management of the airway in trauma patients. Its use as an emergent airway when conventional techniques fail is recommended. Alternative equipment such as the combitube, intubating laryngeal mask, lighted stylet, and jet ventilation of the trachea may have a role in some institutions.

Airway research in anaesthesia shows that the thyromental distance (TMD) as a predictor of difficult intubation is subjected to variable sensitivity and specificity. The TMD has a sensitivity of 19% and a specificity of 97% as a predictor of limited laryngoscopic view. Short thyromental distance has been used as a surrogate for inadequate head extension [9].

Sternomental distance (SMD) is an indicator of head and neck mobility. No study has addressed the correlation between SMD and difficult laryngoscopy in

the Indian population. The cut-off point of SMD suggested for predicting difficult laryngoscopy is 12.5 cm and 13.5 cm. Our aim was to evaluate anatomical measurements commonly used to predict a difficult airway in the Indian population, thereby revealing differences with measurement values obtained in non-Indian patients. We did not attempt to define cut-off values for TMD or SMD in this study as the sample size was not large enough to determine the cut-off threshold values. It is important to note that no single anatomical factor determines the ease of difficult laryngoscopy and therefore no single anatomic factor can be used to predict a difficult intubation.

Bougie-assisted blind tracheal intubation still remains a reasonable strategy for controlling the airway in patients who have restricted cervical spine movements.

REFERENCES

1. Gupta AK, Ommid M, Nengroo S, Naqash I, Mehta A; Predictors of difficult intubation : Study in Kashmiri population, BJMP, 2010; 3(3) :307.
2. Posner K, Caplan R; Medical-legal considerations: the ASA closed claims project. In Hagberg C editor; Benumof's Airway Management Principles and Practice. 2nd edition, Philadelphia: Mosby Elsevier; 2007: 1272-1282.
3. Saini S, Bala R, Singh R; Left molar approach improves laryngeal view in patients with simulated limitation of cervical movements. Acta Anaesthesiol Scand., 2008; 52(6): 829-833.
4. Mashio H, Kojima T, Goda Y, Kawahigashi H, Ito Y, Kato M; Intubation of a patient with rheumatoid arthritis with a 7.5-mm-ID armored endotracheal tube using a laryngeal mask airway. Masui, 1997; 46(12):1639-1643.
5. Smith CE, Pinchak AB, Sidhu TS, Radesic BP, Pinchak AC, Hagen JF; Evaluation of tracheal intubation difficulty in patients with cervical spine immobilization: fiberoptic versus conventional laryngoscopy. Anesthesiol., 91(5):1253-1259.
6. Asai T, Eguchi Y, Murao K, Niitsu T, Shingu K; Intubating laryngeal mask for fiberoptic intubation - particularly useful during neck stabilization. Can J Anaesth., 2000; 47(9):843-848.
7. Inoue Y, Koga K, Shigematsu A; A comparison of two tracheal intubation techniques with trach light and fastrach in patients with cervical spine disorders. Anesth Analg., 2002; 94(3): 667-671.
8. Brimacombe JR, Berry A; The incidence of aspiration associated with the laryngeal mask airway: a meta analysis. J Clin Anesth., 1995; 7(4): 297-305.
9. Qudaisat IY, Al-Ghanem SM; Short thyromental distance is a surrogate for inadequate head extension, rather than small submandibular space, when indicating possible difficult direct laryngoscopy. Eur J Anaesthesiol., 2011; 28(8): 600-606.