

Iatrogenic Foreign Body (Cotton Swab) in the Trachea after Nasotracheal Intubation

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We describe our experience about a 3-inch cotton swab being misplaced in the trachea following nasotracheal intubation. A 67-year-old male patient was scheduled for oral cancer surgery. Before nasotracheal intubation, an oxymetazoline hydrochloride-soaked 3-inch cotton swab was inserted into right nostril for nasal mucosal vasoconstriction. Unpredictable difficult ventilation and intubation occurred during anesthesia induction and then fiberoptic bronchoscope-aided nasotracheal intubation was performed. The cotton swab was inconceivably found in the trachea by fiberoptic bronchoscope, and it was removed immediately by thoracic surgeon. This case demonstrates a near-miss complication during anesthesia induction. We discuss the factors which may contribute to this complication.

Key words: nasotracheal intubation, Foreign body-cotton swab

INTRODUCTION

Nasotracheal intubation is routinely used in patients undergoing oral-maxillary surgery. Various complications resulting from nasotracheal intubation may occur, such as epistaxis¹⁻⁴, intracranial intubation⁵, nasal turbinate injury^{6,7}, and oropharyngeal injury⁸⁻¹⁰. Iatrogenic foreign body in the trachea has been reported after laryngoscopy during anesthesia induction¹¹. We report here a case of iatrogenic 3-inch cotton swab in the trachea after nasotracheal intubation. This is our first potential complication about the use of 3-inch cotton swab in nasal preparation before nasotracheal intubation.

CASE REPORT

A 67-year-old, 163cm, and 63kg man, diagnosed as tonsil carcinoma staged for type IV, was scheduled for tu-



Fig. 1 The cotton swab we used in this case.

mor excision and modified radical neck dissection under nasotracheal intubated general anesthesia. He was otherwise healthy until he received the tonsil mass biopsy due to a 3-month symptom of dysphagia five months ago. Preoperatively, he underwent a series of chemotherapy and radiotherapy after the biopsy confirmed squamous cell carcinoma of the tonsil with neck lymph nodes metastasis. Preoperative laboratory studies revealed most data within normal range except lower hemoglobin (10.5mg/dL) and serum potassium (3.2 mEq/L). The electrocardiogram and chest roentgenogram were normal. Airway examination showed a Mallampati class II with no symptom of airway compromise, and both nasal passages were patent. For preparing nasotracheal intubation, an oxymetazoline hydrochloride-soaked cotton swab (3-inch in length) (Fig. 1) was inserted into the right nostril for mucosal vasoconstriction. At the same time,

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anesthesia was induced with 300mg thiamylal sodium, 0.1mg fentanyl, 80mg 2% lidocaine, and 80mg succinylcholine intravenously. Positive pressure mask ventilation was applied as soon as the spontaneous respiration was absent. However, it was difficult to ventilate despite an oropharyngeal airway was inserted. By the assistance of another anesthesiologist, the airway problem was solved by two-hand jaw-thrust method with no desaturation. The tracheal intubation was performed by the insertion of a thermo-softened, lubricated with lidocaine gel, and 7.0 size nasal endotracheal tube (NETT) via right nostril. During blind insertion of the NETT, mild resistance was felt when the NETT passed about 7cm in the nasal cavity. The subsequent direct laryngoscopy helped to intubate tracheally was failed after several attempts. The direct laryngoscopic view showed Cormack-Lehane grade III. At that moment, using fiberoptic bronchoscope (FOB)-aided nasotracheal intubation was decided. Positive pressure mask ventilation with 100% oxygen was continued and the patient returned spontaneous respiration about three minutes later. After passing the FOB into trachea, a warmed and lubricated 7.0 size NETT which had already been invaginated into the FOB was then slid into the trachea. The whole course proceeded smoothly. Then, 40mg rocuronium and 4% sevoflurane with oxygen were administered for deepening anesthesia. Before fixation of the NETT, FOB was reinserted for checking the optimal position of the NETT tip. Inconceivably, a cotton swab, which initially inserted in the right nostril, was found in the trachea through the FOB's view (Fig. 2). Thoracic surgeon was consulted and he removed the cotton swab by a loop snell through the suction channel of FOB. Repeated bronchoscopy revealed no active bleeding or mucosal injury secondary to the cotton swab. The planned surgery was subsequently started and proceeded uneventfully. No airway problem was noted during his following hospitalization. He was discharged on the 14th postoperative day.

DISCUSSION

Although foreign body retention in the trachea has been reported^{12,13}, most of the reported cases were caused by accidental aspiration. The case presented here is our first report of a 3-inch cotton swab in the trachea following the course of nasotracheal intubation. The occurrence of this inconceivable event is associated with several coexistent factors. Human error is considered as the major factor in this case. It can be viewed in two ways: the person approach and the system approach¹⁴. With respect



Fig. 2 A cotton swab is shown in the trachea carina region.

to person approach, the procedure of inserting cotton swab into nostril before nasotracheal intubation was not violated according to our department standard protocol for nasotracheal intubation. However, the emergent condition of difficult ventilation stressed the anesthesiologist and made him with aberrant mentality, thus leading to forget to remove the inserted cotton swab. For systemic approach, some points made system fail in this case, even though all hazardous technologies possess barriers and safeguards. We thought that, firstly, nasal preparation performed during anesthesia induction was not appropriate. An unexpected event may interrupt or mistake the two procedures. Secondly, the cotton swab chosen for nasal packing was too short (3-inch in length) to facilitate missing in nasal cavity. Accordingly, finishing nasal preparation prior to anesthesia induction and using a long cotton swab are suggested for nasotracheal intubation.

Usually, it is not easy for the cotton swab to move from nasal cavity to the trachea. Under an unclear mechanism, we speculated that pushed by NETT or aspirated with patient's inspiration might contribute to this result. Fortunately, the near-miss complication was avoided by the following fiberoptic bronchoscopic check up.

There are some points regarding the difficult airway needed to discuss in this case. The patient showed difficult mask ventilation (DMV) in spite of muscle paralysis and graded II-class Mallampati score. However, it may be not surprising for this result when we rechecked the characteristic of the patient afterward. Of the risk factors associated with DMV¹⁵, the patient presented here showed two risk factors. Firstly, mild neck stiffness and limited mandibular protrusion were noted due to previous radiation therapy. Secondly, history of snoring was traced. For the same reason, difficult intubation was also

deemed in this case.

In conclusion, this is the our first case of a 3-inch cotton swab accidentally fell in the trachea following nasotracheal intubation. Although human error contributed majorly, we suggest that nasal preparation should be completed prior to anesthesia induction and use of short cotton swab should be avoided to prevent the reported complication.

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