Case Report

Fiberoptic intubation in patient who have had unilateral radical maxillectomy – A case report

Yei Heum Park, Se Hun Kim, Soo Jee Lee, Jihyun Yang, Hyojoong Kim

Department of Anesthesiology and Pain Medicine, Haeundae Paik Hospital, Inje University, Busan, Korea

Herein, we describe a case of airway management that was expected to be difficult due to previous radical maxillectomy surgery. A 68-year-old man was scheduled for maxillary defect reconstructive surgery. He had undergone left radical maxillectomy the previous year; therefore, he had no teeth, palate, or maxilla bone on his left side. We performed rapid sequence induction using a fiberoptic bronchoscopy under general anesthesia, considering the impossibility of mask ventilation, the defect of the upper airway, and the patient's medical illness. Tracheal intubation was very smooth. Although the airway management devices available and the conditions at each center will vary, using fiberoptic bronchoscopy is a valid first option in cases similar to the current case. (Rawal Med J 202;45:990-993).

Key Words : Fiberoptic bronchoscopy, fiberoptic intubation, difficult airway management.

INTRODUCTION

Inducing anesthesia in patients with difficult airways is challenging. For this reason, many studies have investigated the management of difficult airways.[1,2] In cases of elective surgery, anesthesiologists can determine associated risks and devise management strategies for airway management in advance. Many airway management-related societies have proposed recommendations for the prediction of difficult airway, and strategies for its management.[3,4,5] However, there are no guidelines for specific situations. Therefore, in many situations the choice of device is based on the anesthesiologist's experience. The first choice is particularly important in patients who require rapid sequence induction (RSI), and in patients in whom mask ventilation is expected to be difficult.

Herein, we describe a case in which airway management was expected to be difficult because of absence of unilateral maxilla, hard palate, and teeth due to a prior radical maxillectomy. Fiberoptic bronchoscopy (FOB) was the first choice for intubation, and it facilitated successful airway management.

CASE PRESENTATION

A 68-year-old man who had maxillary defect (Fig. 1 and 2) visited the hospital for reconstructive surgery. He had experienced fungal sinusitis and undergone endoscopic sinus surgery the previous year, but the infection was extensive and left-side radical maxillectomy had been conducted. According to Brown's system,[6] the patient's vertical classification was III (orbital adnexa involvement with orbital retention) and his horizontal classification was b (≤1/2 unilateral). On the left side, he had no hard palate, teeth, or turbinate due to the prior radical maxillectomy, resulting in a large cavity (Fig. 3). Besides the above-described airway problem, he had other medical conditions including diabetes mellitus, hypertension, atrial fibrillation, and unstable angina, and a history of stroke.

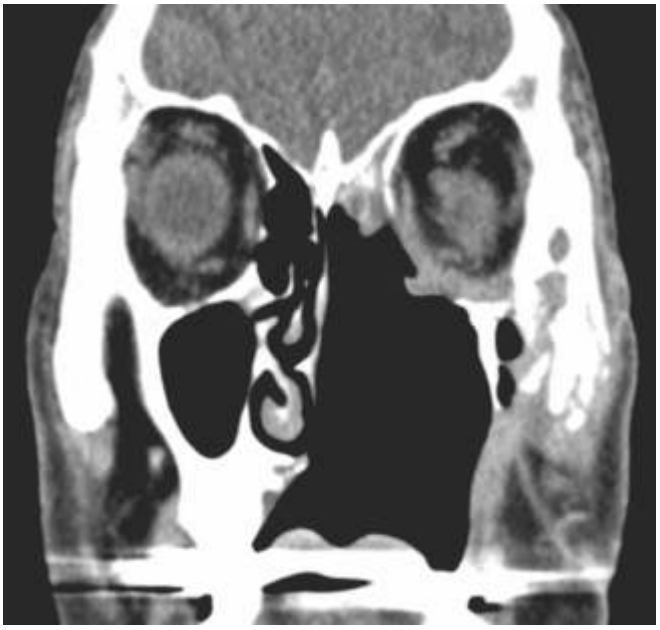
Fig 1. Left radical maxillectomy status before surgery.

The authors considered the following points with respect to airway management: 1) Mask ventilation was not likely to be successful because there was no palate and the paranasal sinus opens below the orbit, 2) the both sides of the face were asymmetric, 3) avoiding damage the surgical field, and 4) minimization of hemodynamic fluctuations. Several available options were considered, and ultimately the decision was made to perform RSI under anesthesia and intubate using a FOB, which is one of the more advanced airway devices.

Fig. 2. Inside view of the patient's mouth from below. There is no teeth and no hard palate on left side.

Anesthesia induction was initiated under standard American Society of Anesthesiologists (ASA) monitoring, bispectral index (BIS) score monitoring, and train-of-four monitoring. For RSI, preoxygenation was performed with 80% oxygen for 5 minutes, then 0.5 mg/kg lidocaine and 1.5 mg/kg propofol were injected. After confirming unconsciousness via patient responses and BIS, 1.2 mg/kg rocuronium was administered. Mask ventilation was attempted but it was abandoned due to the predicted difficulties. One minute after rocuronium administration, the train-of-four count reached zero and intubation was attempted. With the jaw lifted by an assistant, a FOB was carefully inserted into the vacant space with no teeth and no hard palate on the left side of the patient's upper airway. Contrary to the expected difficulty, the absence of hard palate and teeth on the left side made it easier to perform fiberoptic intubation (FOI) than it is in patients with normal facial anatomy.

Fig. 3. PNS CT findings.



After successfully performing gentle tracheal intubation, reconstruction of the maxilla and midface was undertaken. At the conclusion of the operation, appropriate train-of-four monitoring results, the patient was extubated and transferred to the intensive care unit. There were no respiratory or cardiovascular complications.

DISCUSSION

In the era of direct laryngoscopy there were few options to choose from when faced with difficult airway management. This changed rapidly after the 1960s with the introduction of FOB by Murphy[7] and Ikeda et al.[8] FOI has since become one of the gold standard methods for difficult airway management. With the comparatively recent advent of videolaryngoscopy and the development of supraglottic airways, more options are now available for difficult airway management. Nevertheless, FOB has advantages in patients with poor dental condition, a high risk of aspiration,

and/or an unstable cervical spine.[9]

With the development of airway management equipment, the ASA, the Difficult Airway Society, and many other societies continue to update their guidelines for the management of difficult airways.[1-5] In addition to being familiar with these guidelines, anesthesiologists need to consider techniques that may be optimal in individual cases.

In the present case, mask ventilation was not possible due to the missing facial structures, and there were concerns associated with attempting awake intubation. In this regard, Moustafa et al.[10] reported that pre-sized obturators facilitated mask ventilation in infants with unilateral cleft palate. Furthermore, patient had no indications of difficult airway other than the pre-existing facial structure abnormalities. Thus, the decision was made to attempt tracheal intubation after the induction of general anesthesia via RSI.

There was a question as to which advanced airway device to use. Because the scheduled procedure was facial reconstructive surgery, a supraglottic airway was not a viable first choice, and it was only prepared for in the case of an emergency. Considering the major facial asymmetry resulting from the absence of teeth and the maxilla on one side, FOB was deemed to be the better option than laryngoscopy. It was surmised that the absence of palate and teeth may have made it difficult to stabilize the blade of the laryngoscope without it falling into defects, which may have increased the number of intubation attempts required, the overall intubation time, and the potential for associated trauma. The relevant disadvantage of FOB in the current case was that it takes more time than videolaryngoscopy, but it was decided that sufficient preoxygenation could provide the time needed for FOI.

Intubation using FOB was successful. With the head tilted, the chin lifted, and the jaw thrusted in the supine position, the empty left-side oral cavity provided enough room for the bronchoscope and also facilitated better alignment of the oral, pharyngeal, and laryngeal axes. In general, when performing orotracheal FOI it is difficult to obtain a satisfactory view of the larynx due to the base of the tongue, but in the current patient there was a large space due to a pre-existing defect.

In conclusion, FOB was used for successful airway management in the present patient but in other cases the first choice will be affected by various factors including the equipment available at the center, familiarity with the available airway devices, and the skill and experience of the clinicians. That said, the current case demonstrates that in similar situations FOI is definitely worth considering as the first option.

Author Contributions:
Conception and design: Yei Heum Park
Collection and assembly of data: Soo Jee Lee, Jihyun Yang
Analysis and interpretation of the data: Soo Jee Lee
Drafting of the article: Yei Heum Park
Critical revision of the article for important intellectual content: Se Hun Kim, Hyojoong Kim
Final approval and guarantor of the article: Hyojoong Kim
Corresponding author email: Hyojoong Kim: h00386@paik.ac.kr
Conflict of Interest: None declared
Rec. Date: Apr 11, 2020 Revision Rec. Date: May 10, 2020 Accept Date: Nov 13, 2020

REFERENCES

1. Apfelbaum JL, Hagberg CA, Caplan RA, Blitt CD, Connis RT, Nickinovich DG, et al. Practice guidelines for management of the difficult airwayan updated report by the American Society of Anesthesiologists task force on management of the difficult airway. Anesthesiology 2013;118:251-70.
2. Frerk C, Mitchell VS, McNarry AF, Mendonca C, Bhagrath R, Patel A, et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. Br J Anaesth 2015;115:827-48.
3. Law JA, Broemling N, Cooper RM, Drolet P, Duggan LV, Griesdale DE, et al. The difficult airway with recommendations for management–part 1–difficult tracheal intubation encountered in an unconscious/induced patient. Can J Anaesth 2013;60:1089-118.
4. Law JA, Broemling N, Cooper RM, Drolet P, Duggan LV, Griesdale DE, et al. The difficult airway with recommendations for management–part 2–the anticipated difficult airway. Can J Anaesth 2013;60:1119-38.
5. Japanese Society of Anesthesiologists. JSA airway management guideline 2014: to improve the safety of induction of anesthesia. J Anesth 2014;28:482-93.
6. Brown JS, Shaw RJ. Reconstruction of the maxilla and midface: introducing a new classification. Lancet Oncol 2010;11:1001-8.

7. Murphy P. A fibre-optic endoscope used for nasal intubation. Anesthesia 1967;22:489-91.
8. Ikeda S, Yanai N, Ishikawa S. Flexible bronchofiberscope. Keio J Med 1968;17:1-16.
9. Jolin W, John L, Theodore W, Rehana I, Patric W. Fiberoptic intubation in airway management: a review article. Singapore Med J 2019;60:110-8.
10. Moustafa MA, Kandeel AA, Habib AMA, Hassan SA. Feeding obturator as an airway adjunct during complete unilateral cleft palate repair. Indian J Anaesth 2018;62:376-80.