

Success in Difficult Airway Managements with Video Laryngoscope After Two Failures in Intubation with Macintosh and McCoy Laryngoscope: A Case Report

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Abstract

Introduction: Currently, creating a secure airway for general anesthesia is an integral part of the process of anesthesia. The difficulty of this process effects morbidity and mortality rates. In order to achieve further success in these patients, it is advised to use video laryngoscope.

Case Presentation: The patient was a 45-year-old female, who was a candidate for cholecystectomy along with laparoscopic surgery, and had referred to Peimaniyeh hospital of Jahrom, Iran, during September 2016. In the initial assessment, the patient seemed to be in a difficult airway class, while in her surgery documents from 5 and 10 years ago and in her previous records no history of this problem was mentioned. After the administration of drugs before surgery and anesthesia induction, tracheal intubation had failed by use of routine laryngoscope and McCoy laryngoscope in two stages. Finally, the use of video laryngoscope for tracheal intubation was successful. During the intubation attempts, the patient was ventilated with 100% oxygen mask and her arterial blood oxygen saturation had not decreased.

Conclusions: Therefore, it is recommended for the patient to be investigated carefully in terms of airway management. In addition, in case of difficult intubation, selecting video laryngoscope to facilitate intubation may be appropriate. The mere absence of a difficult airway management is not a reason that the problem will not occur in the future.

Keywords: General Anesthesia, Airway Management, Intubation, Video Laryngoscope, Macintosh, McCoy Laryngoscope

1. Introduction

Difficult intubation is referred to as a clinical condition in which the patient's endotracheal tube ventilation is not or hardly done (1). Difficult and inappropriate intubation may lead to several complications, including prolonged process of healing, inflammation of the throat and larynx spasms and in severe cases even the death of the patient (35%) (2).

Laryngoscopy is difficult in 6% to 10% of intubation cases. However, difficult intubation or failure in carrying out this procedure has been found in 1.8 - 5.8% and 0.13 - 0.30% of cases, respectively. Using direct laryngoscopy in patients undergoing general anesthesia endotracheal intubation was commonly used, unless certain conditions led to the selection of a different method (3). In comparison to direct laryngoscopy, video laryngoscopy in many

circumstances has shown greater success in the first attempt (4). In this article, a patient with difficult intubation that was brought to the operating room for laparoscopic surgery is presented.

2. Case Presentation

The patient presented in this study was a 45-year-old female, who was moderately obese, weighing 85 kg, and had referred to Peimaniyeh hospital of Jahrom, Iran, during September 2016 with epigastric pain. Other symptoms included anorexia, constipation, nausea, and vomiting. Regarding history, the patient did not express specific underlying disease. After physical examination and additional tests, the patient was diagnosed with gallstones and was transferred to the operating room for cholecystectomy with laparoscopic surgery.

In initial examination by an anesthesiologist, in terms of airway management, the patient was diagnosed with Mallampati III-IV class and difficult intubation. Other findings in this patient confirmed a difficult intubation, including neck stiffness in head extension, short neck, thyromental distance of about 4 cm, limited mouth opening, anterior tracheal, and relatively prominent incisors. Therefore, the equipment required for difficult intubation was prepared previously. The equipment was calibrated.

The patient's vital signs on the day of surgery included: blood pressure of 125/85 mmHg, heart rate of 82 beats per minute, respiratory rate of 20 breaths per minute and temperature of 36.5°C. The SAADAT monitor (S1800) was employed for monitoring the patient during and after the surgery. Drugs used for anesthesia were as follows: 2 mg of Midazolam, intravenously, 10 mg of morphine, intravenously, 425 mg of sodium thiopental, intravenously, 34 mg of atracurium, intravenously, and 85 mg of 2% lidocaine, intravenously. The patient was ventilated for 3 minutes with a mask by 100% oxygen to become completely relaxed and ready for intubation with ETT tube of Supra Model, No. 7.5. The first attempt for intubation, under the direct vision of blade 4 common laryngoscope, failed after 30 seconds. In the next step, after re-ventilation with a mask and 100% oxygen, blade 4 McCoy laryngoscope with guide was used in the tracheal tube, and this effort was also not successful. In the third step, followed by re-ventilation by mask with 100% oxygen and using video laryngoscope with an intermediate size monitor, the difficult tracheal intubation was done successfully (Figures 1 and 2). In all these steps, ventilation of the patient with a mask and 100% oxygen was successful and patients' arterial blood oxygen saturation was not decreased at any time. At the end of the surgery and after the patient's recovery was complete, and the problem was recorded in her file, a full description was provided for the patient and her relatives, for them to explain this condition to the anesthesiologist if she needs a surgery in the future.

In the history taken from patient, there was a history of 2 previous surgeries under general anesthesia. The first was appendectomy, about 5 years ago, and the other was an ovarian cyst surgery about 10 years ago, without any side effects. No evidence of difficult tracheal intubation was observed by assessing the patient's previous surgery documentation. Also, after a comprehensive investigation, there was no condition that led to stiffness of the upper airway such as rheumatoid arthritis, etc. during this period. Therefore, without any specific disease, the intubation had become difficult for the patient after a period of time.

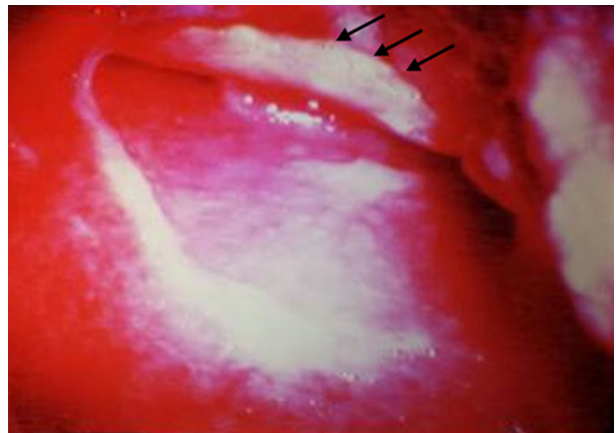


Figure 1. Epiglottis in Patient Airway in Laryngoscopy with Video Laryngoscope

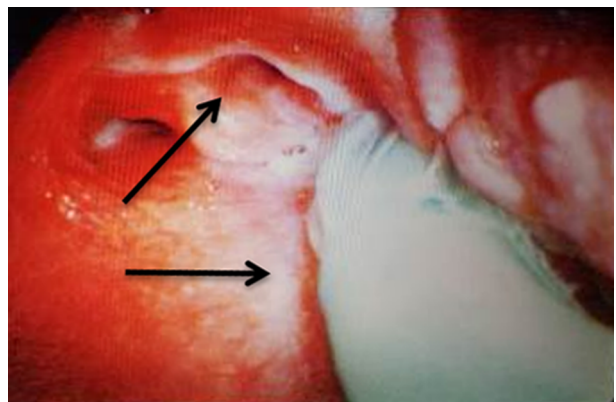


Figure 2. Insert the Endotracheal Tube in the Patient Airway

3. Discussion

The American Society of Anesthesiologists in 1993 defined difficult intubation as 3 times of intubation or spending more than 10 minutes for intubation in order to keep the oxygen pressure of more than 90% using 100% oxygen (5, 6).

There are several ways to identify patients at risk of difficult intubation before anesthesia. Difficult airway assessment starts with a comprehensive medical history and physical and regional examination. There are several key factors for the physician to control, including: changes in normal anatomy, pathogenic conditions, limited mouth opening, prominent upper teeth, large tongue, and immobility of the head, neck, and jaws. Changes in normal anatomy and airway anatomy characteristics due to the pathogenic condition could lead to a number of problems. Several conditions have been reported, that predispose pa-

Table 1. The Patient Informative Display

The Patient	Variables
History	45 year-old
	Moderately obese
	Weighing 85 kg
Symptoms	Anorexia
	Constipation
	Nausea and vomiting
	Epigastric pain
	Mallampati III-IV class
Physical examination	Neck stiffness in head extension
	Short neck
	Thyromental distance about 4 cm
	Limited mouth opening
	Anterior tracheal
	Relatively prominent of incisor

tients to difficult airway intubation. These conditions include infection, trauma, obesity, endocrine factors, foreign bodies, tumors, inflammatory conditions, congenital problems and etc. Generally, the factors that predispose patients to difficult airways are divided to 2 categories: congenital and acquired (7).

From the medical history of the patient and also from previous surgery files, no record of a difficult airway was observed. From the above-mentioned factors that are effective in creating a difficult airway, low mobility of head and neck, limited opening of the mouth, predominant incisor, obesity, and the anterior tracheal were observed in this patient. According to no difficult airway history in this patient, acquired factors could be effective in creating this problem. Acquired factors consist of infections (such as supraglottitis and croup, etc.), arthritis (rheumatoid arthritis, ankylosing spondylitis, etc.), tumors, obesity, etc. (7). After a comprehensive investigation was conducted on the patient, among the acquired factors, only obesity (BMI = 27.7) was present in this patient and other acquired factors were not involved in the creation of a difficult airway. Therefore, it could be suggested that anesthesiologists should not focus on the absence of difficult airway history and all patients should be examined carefully and even if there is a single factor in development of difficult airway, all the necessary preparations should be provided for laryngoscopy and difficult intubation.

Intubation with direct laryngoscopy and video laryngoscope are different from each other in terms of technique. In direct laryngoscopy, the operator should be

pressed and move upper airway tissue to create a direct line of sight. This technique often leads to difficulty in observing the larynx properly. In the Video-laryngoscope, the blade with high angle and tiny camera allowed the operator to see the environment of structures that are impeding direct vision, so the necessity of displacement of upper airway tissues disappeared. The best view of the entrance of the larynx often comes with the video from the laryngoscope (8). Compared with direct laryngoscopy, video laryngoscope for difficult intubation has better visibility, higher success rate, faster intubation, and also low requirements for different maneuvers (9). In this patient after trying to use McCoy and normal laryngoscope for intubation that was unsuccessful, eventually intubation was performed using a video laryngoscope.

Mosier et al. (2013) reported that the use of a video laryngoscope has improved the success rate of emergency intubation and compared with a conventional direct laryngoscopy with Macintosh blade, the esophageal intubation rate was lower (4).

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