



Research Article

AIRWAY PREPAREDNESS IN AN ANTICIPATED DIFFICULT AIRWAY- THE NEXUS OF AIRWAY MANAGEMENT

Aditya Devalla<sup>1</sup>, Aparna Satish\*<sup>2</sup>, Suvajit Podder<sup>3</sup>, Deepali Shetty<sup>4</sup> and Sitara Raghavan Nandyal<sup>5</sup>

<sup>1,2,3,4,5</sup>Department of Anaesthesiology, Kasturba Medical College, Manipal

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ABSTRACT

A potentially challenging airway can be detrimental to patient outcomes if not approached cautiously. In the Closed Claims Analysis performed by the American Society of Anesthesiology, failed intubation remains a major cause of morbidity and mortality. The management of an anticipated difficult airway is highly variable and is based on many factors, including the anaesthesiologist's skill set and resource availability. The management of an anticipated difficult airway is highly variable and is based on many factors, including the anaesthesiologist's skill set and resource availability. Airway preparedness is crucial in the setting of an anticipated difficult airway.

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INTRODUCTION

A difficult airway can be potentially fatal if not approached vigilantly. An airway management complication occurs in 1 in every 22,000 anaesthetics, with death or brain damage occurring 1 in 1,80,000.[1] The American Society of Anesthesiologists defines a difficult airway as existing when "a conventionally trained anaesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both".[2] The management of an anticipated difficult airway is highly variable and is based on many factors, including the anaesthesiologist's skill set and resource availability. Airway preparedness is crucial in the setting of an anticipated difficult airway. We report one such case of an anticipated difficult airway, where an airway management plan was meticulously charted out based on the difficulties anticipated and the resources at hand.

Case Report

A 50-year-old patient presented to us with dysphagia. He is an old case of carcinoma buccal mucosa and had received nine cycles of chemotherapy and 30 cycles of radiation therapy. He also underwent a composite resection of the buccal mucosa lesion with hemimandibulectomy and an anterolateral thigh-free flap under general anaesthesia 5 years ago. Further evaluation revealed a keratinizing squamous carcinoma of the oesophagus. The patient was planned for a transhiatal esophagectomy. He had no comorbid illnesses, and systemic examination was within normal limits. On examination, we anticipated having a difficult airway. The patient was

edentulous, had facial asymmetry due to surgical changes and had a reduced mouth opening of 5 cm.

Owing to the anticipated difficulty in both mask ventilation and intubation, we formulated an airway management plan a day prior to surgery:

**Plan A:** Inhalational induction with sevoflurane while preserving spontaneous breathing and a check laryngoscopy with a c-mac videoscope:

1. If the vision of the vocal cords with the videoscope is deemed adequate, the patient would be paralysed with IV Succinylcholine 100 mg, and intubation would be attempted after confirming adequate depth of anaesthesia and relaxation.
2. If the vision with the videoscope is inadequate, we would proceed to Plan B
3. If intubation is unsuccessful after paralysis, another attempt by a more experienced anaesthesiologist would be made after confirming adequate depth of anaesthesia and relaxation. In case of an unsuccessful attempt by the second anaesthesiologist, a supraglottic airway device would be inserted to ventilate the patient till there are spontaneous breathing efforts, then proceed to Plan B
4. If the placement of the supraglottic airway device fails, another attempt would be made by the second anaesthesiologist after confirming adequate depth of anaesthesia and relaxation.
5. If unsuccessful, we would declare a CICO situation and call for help. Prepare for an emergency FOA -in the form of an emergency tracheostomy by the surgeons.

\*Corresponding author: Aparna Satish

Department of Anaesthesiology, Kasturba Medical College, Manipal

- **Plan B:** To taper and stop the Inhalational agents and wait for the patient to be fully awake. After adequate suctioning of the oral cavity, perform an awake fibroptic intubation using the spray-as-you-go technique.
- **Plan C:** If awake fibroptic intubation is unsuccessful due to bleeding/ excessive secretions and poor vision, a discussion with the surgeons regarding the urgency of the surgery and the need for an elective tracheostomy would be considered.

The Difficult Airway Cart (DAC) was kept ready on the day of surgery. The patient was monitored using standard ASA-recommended monitors. An 18-gauge intravenous access was secured. A thoracic epidural catheter was secured at the T8-T9 level. An arterial line was secured in the left radial artery and transduced. We went ahead with Plan A: An inhalational induction was performed using sevoflurane while preserving spontaneous breathing efforts. IV fentanyl 50 mcg and propofol of 30 mg were administered prior to the check laryngoscopy using the c-mac videoscope. On the pretext of adequate visualisation of the vocal cords, the patient was paralysed with IV succinylcholine 100 mg and another bolus of IV fentanyl 50 mcg was given. Once adequate relaxation was achieved, the patient was intubated under vision with an 8 ID portex cuffed endotracheal tube. The tube position was confirmed with five-point auscultation and capnography trace. Depth of anaesthesia was maintained using isoflurane, oxygen, and nitrous oxide to achieve a MAC of 1.0. Multimodal analgesia was provided with a bolus of IV ketamine 30mg, followed by an infusion of ketamine at 0.5 mg/kg/hour, IV dexamethasone 8 mg, IV paracetamol 15 mg/kg and IV morphine 0.1 mg/kg. Local anaesthetic agent 0.2% ropivacaine was started at the rate of 4 ml/hour via the thoracic epidural catheter. IV Vecuronium was used for muscle relaxation.

Lung protective ventilation strategies were employed using the VCV mode of ventilation with a tidal volume of 4-5 ml/ kg and a positive end-expiratory pressure of 5 cm of water. Peak airway pressures of 20-25 mm Hg were targeted throughout the procedure.

Intra-operative hypothermia was prevented using forced air warmers, fluid warmers and sterile drapes. A core body temperature of 35.3-35.9 was maintained intraoperatively. A mechanical DVT pump was used intraoperatively as a part of DVT prophylaxis.

We employed goal-directed fluid administration to target a MAP above 75 mm Hg and a urine output of 0.5-1 ml/kg/hour. Hemodynamic stability was maintained throughout the procedure.

The patient was extubated once fully awake, and the criteria for extubation were met. In the postoperative intensive care unit, the patient was continued on the local anaesthetic infusion of 0.2% ropivacaine at 4 ml/hour via the epidural catheter. He also received IV paracetamol 15 mg/kg TID and rescue analgesia in the form of IV Fentanyl 50 mcg bolus if NPS>4. The patient was on DVT prophylaxis with a mechanical DVT pump and was started on Incentive spirometry in the postoperative period.

## DISCUSSION

Expertise in airway management is a prime clinical skill honed by an anaesthesiologist. A difficult airway can be life-threatening and detrimental to patient outcomes if not approached cautiously. In the Closed Claims Analysis performed by the American Society of Anesthesiology, failed intubation remains a major cause of morbidity and mortality.[3]

Proper pre-operative assessment and prediction of a difficult airway are of paramount importance and can often be life-saving. It is also imperative to distinguish a difficult intubation from a difficult mask ventilation. Although there are numerous societal guidelines to tackle an anticipated difficult airway, they only provide a basic pathway to managing it. Every case must be well planned and tailored to factor in the nature of the surgery, resource availability, the skillset of the anaesthesiologist, as well the patient factors. Anticipation and being prepared can prevent disastrous consequences. Airway preparedness includes the formulation of an airway management plan and making available airway equipment such as the Difficult Airway Cart.

In our case, an airway management plan was drawn out pre-operatively in anticipation of a potentially difficult airway. Additional airway equipment was available, and an experienced anaesthesiologist was called for help. This aided us in being prepared to tackle any difficulty while securing the airway.

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