

# Anticipated Difficult Airway Management with Ambuscope in a Patient with Rhino-orbito-cerebral Mucormycosis

MICHELL GULABANI<sup>1</sup>, VIBHOR GUPTA<sup>2</sup>, SUMAN CHOUDHRY<sup>3</sup>, ASHOK KUMAR SAXENA<sup>4</sup>

(CC) BY-NC-ND

## ABSTRACT

Management of a difficult airway can be a nightmare for even an experienced anaesthesiologist. Video laryngoscopes have been mentioned in the difficult airway cart as a requisite equipment according to 2016 All India difficult airway guidelines. Ambuscope is a recently introduced flexible videoscope which is portable, light weight and single use device. This was a case of 25-year-old male who presented with loss of vision in both eyes and diffuse swelling of the face in the Ophthalmology Department. A diagnosis of post Coronavirus Disease-19 (COVID-19), Rhino-orbito-cerebral mucormycosis was made. Further patient was scheduled for emergency surgical debridement and bilateral orbital exenteration under general anaesthesia. Airway assessment revealed mouth opening of one finger, Mallampati (MPG) score of 4, thyromental distance of 4.5 cm and a receding mandible with normal neck flexion and extension. Ambuscope™ 3 was employed for facilitating endotracheal intubation after anaesthesia induction. Ambuscope is a useful aid in confirming the position of endotracheal tubes and tracheostomy tubes in the operating room and intensive care unit. They are a disposable, convenient and practical alternative to fiberoptic bronchoscopes in patients of difficult airway. Ambuscope™ 3 has tip movements with 150° up and 130° down. These unique features make this equipment user-friendly in anticipated and unanticipated difficult airway scenarios. Flexible endoscopes have carved a niche for themselves in the armamentarium of the anaesthesiologist airway cart to be equipped for any challenge.

**Keywords:** Challenging intubation, Emergency surgery, Video laryngoscope

## CASE REPORT

A 25-year-old male, presented to the Ear, Nose and Throat (ENT) Department with a chief complaint of sudden onset loss of vision and facial swelling since two days [Table/Fig-1]. Prior to this patient had history of foul smelling nasal discharge since 12-14 days and nasal stuffiness since 10 days. Patient was COVID negative when presented to the hospital. Past history revealed that he had been chewing tobacco for the past 5-6 years occasionally.



**[Table/Fig-1]:** Showing facial swelling and bilateral orbital soft tissue invasion due to mucormycosis.

A consent form signed by the patient preoperatively regarding his agreement to having his case published in a journal for scientific benefit was taken. The patient had been COVID-19 positive 25 days

before presenting to our hospital and received some medication from a local private practitioner for the same. However, no documentation was available in the records.

On examination, the patient was conscious with a Heart Rate (HR) of 64 beats/minute and Blood Pressure (BP) of 114/62 mmHg, oxygen saturation on room air was 99%. On examination of the nose and oral cavity, the patient had excoriating discharge from both the nostrils with hard palate perforation. The scraping obtained from the nasal cavity was sent for culture and sensitivity to the Microbiology Department. Haematological investigations revealed Haemoglobin (Hb) of 9.4 gm/dL, Total Leukocyte Count (TLC) 10,600 /mm<sup>3</sup>, platelet count of 180000/uL. Blood urea 56 mg/dL and serum creatinine 1.8 mg/dL, serum sodium 134 mEq/L, serum potassium 3.4 mEq/L, serum chloride 110 mEq/L, RBS 180 mg/dL with an HbA1c of 12% and RT-PCR for COVID-19 revealed to be negative.

Non Contrast Computerised Tomography (NCCT) of the para-nasal sinuses and orbit showed rhinosinusitis with extensive soft tissue invasion in intra-temporal, premaxillary, masticular and pterygopalatine regions. Bilateral orbital extension with erosion of inferior wall of orbit and bilateral pneumonitis. Chest X-ray and Electrocardiogram (ECG) were normal.

After radiological examination, culture report and clinical examination, a diagnosis of rhino-orbito-cerebral mucormycosis was made. An emergency surgical debridement including bilateral (B/L) orbital exenteration and B/L sinonasal debridement under general anaesthesia along with systemic antifungal medications was planned to halt the progression of disease. Preoperative evaluation done by the anaesthetist of the airway, which revealed a mouth opening of one finger, Mallampati (MPG) score of 4, thyromental distance of 4.5 cm and a receding mandible with normal neck flexion and extension.

Ambuscope™ 3, a flexible videoscope was used for facilitating endotracheal intubation after anaesthesia induction owing to the fact of an anticipated difficult airway and challenging intubation. The patient was shifted in the operating room after which routine

monitoring in the form of 5 lead electrocardiogram, non invasive Blood Pressure (BP), and oxygen saturation probe was applied. Ambuscope was prepared by connecting it to the designated Liquid Crystal Display (LCD) monitor, lubricated and loaded with an 8.0 mm Internal Diameter (ID) endotracheal tube by deflating its cuff completely. Preoxygenation with 100% oxygen for three minutes supplemented with high flow nasal oxygen at 15 L/min with prongs was ensured to increase the cardiopulmonary reserve.

Injection (Inj.) midazolam 1 mg intravenous (i.v.) and Inj. fentanyl 100 ug i.v. was given. Induction was done with Inj. propofol 100 mg i.v. till loss of response to verbal commands. An effective seal with mask ventilation was obtained by observing adequate chest rise and quantitative waveform capnography measuring End Tidal Carbon Dioxide (EtCO<sub>2</sub>). Muscle relaxant Inj. succinylcholine 100 mg i.v. was given and patient was ventilated with 100% oxygen and sevoflurane to MAC of 1% at flow of 10 litres per minute. After ensuring complete muscle paralysis, ambuscope loaded with the endotracheal tube was inserted orally. Oxygenation was done via nasal prongs at 15 L/min continued during apnea period with jaw thrust applied until the carina was visualised. Tracheal tube was railroaded into the trachea and then ambuscope was withdrawn under vision.

Tracheal placement was confirmed by a regular EtCO<sub>2</sub> waveform and mechanical ventilator was set appropriately. Intraoperative course was uneventful and trachea was extubated after surgical procedure with haemodynamics being stable. The patient was discharged 10 days postoperatively and is still coming to the ENT Outpatient Department for follow-up.

## DISCUSSION

Difficult airway management is a challenging task in the hands of even experienced anaesthesiologists. It may contribute to morbidity and mortality in anaesthesia, ranging from soft tissue trauma to severe hypoxemia [1]. Ambuscope, a flexible videoscope gives high resolution images enabling easy navigation and identification of anatomical landmarks enabling incident free intubation in anticipated difficult airway [2].

Studies comparing ambuscope with standard re-usable flexible fibrescopes in manikins to simulate difficult airways has shown similar results in the time to successful intubation [3,4]. In a randomised trial by Chan JK et al., comparing ambuscope and flexible fibreoptic bronchoscope, no significant differences were found in the subjective end points like ease of set up, manoeuvrability, railroading and image quality [5]. Similarly in a case report by Reena, ambuscope was found to be a useful aid in awake intubation of a giant lipoma excision posted for surgical excision [6].

Contrary to this, a study conducted by Krugel V et al., compared ambuscope with fibrescope in patients with cervical immobilisation by a semi-rigid collar and it was concluded that intubation time with ambuscope was longer owing to an increased time to identify the carina [7]. In a cost-analysis study by Perbet S et al., comparing single use ambuscope with reusable bronchoscopes in the intensive care

unit, it was concluded that the cost per procedure for ambuscope is comparable to that of reusable scopes [8].

In an interventional study by Kriege M et al., comparing ambuscope with flexible endoscope in 176 patients undergoing intubation or bronchoscopy, it was concluded that ambuscope is better due to its maneuverability and optimal visualisation rendering it useful in the emergency room where maintenance of a conventional fibrescope might be difficult [9].

The second wave of the COVID-19 pandemic has seen a surge in the cases of mucormycosis and many of them present to the anaesthetist as emergency debridements and invariably have difficult airway too. The incidence is high in the Asian continent especially India (70 times higher) which has a major global burden of uncontrolled diabetes [10]. Our hospital was a dedicated mucormycosis hospital and we dealt with about 300 patients of rhino-orbito-cerebral mucormycosis who were scheduled for sino-nasal debridements and orbital exenteration procedures. Ambuscope is practical and contemporary equipment in the difficult airway cart of the anaesthesiologist in both emergency and elective operating room.

## CONCLUSION(S)

Ambuscope is a convenient alternative to fibreoptic bronchoscope in patients of anticipated difficult airway especially in emergency surgeries as it is quick to set up and easy to hold. Establishing a safe and secure airway is of paramount importance for any anaesthesiologist and ambuscopes aid in doing so even in the most challenging scenarios.

## REFERENCES

- [1] Peterson GN, Domino KB, Caplan RA, Posner KL, Lee LA, Cheney FW. Management of the difficult airway: A closed claims analysis. *Anesthesiology*. 2005;103(1):33-39.
- [2] Jacob M, Vivekanand D, Sharma A. Use of Ambu aScope for tracheal intubation in anticipated difficult airway, a boon. *Med J Armed Forces India*. 2016;72(2):183-85.
- [3] Piepho T, Werner C, Noppens RR. Evaluation of the novel, single-use, flexible aScope for tracheal intubation in the simulated difficult airway and first clinical experiences. *Anaesthesia*. 2010;65(8):820-25.
- [4] Vijayakumar M, Clarke A, Wilkes A, Goodwin N, Hodzovic I. Comparison of the manoeuvrability and ease of use of the Ambu aScope and Olympus re-usable fibrescope in a manikin. *Anaesthesia*. 2011;66(8):683-93.
- [5] Chan JK, Ng I, Ang JP, Koh SM, Lee K, Mezzavia P, et al. Randomised controlled trial comparing the Ambu® aScope™ 2 with a conventional fibreoptic bronchoscope in orotracheal intubation of anaesthetised adult patients. *Anaesth Intensive Care*. 2015;43(4):479-84.
- [6] Reena. Use of Ambu® aScope™ 3 in difficult airway management in giant lipoma neck. *Egypt J Anaesth*. 2016;33(1):121-23.
- [7] Krugel V, Bathory I, Frascarolo P, Schoettker P. Comparison of the single-use Ambu aScope™ 2 vs the conventional fibrescope for tracheal intubation in patients with cervical spine immobilisation by a semirigid collar. *Anaesthesia*. 2013;68(1):21-26.
- [8] Perbet S, Blanquet M, Mourgues C, Delmas J, Bertran S, Longère B, et al. Cost analysis of single-use (Ambu® aScope™) and reusable bronchoscopes in the ICU. *Ann Intensive Care*. 2017;7(1):3.
- [9] Kriege M, Dalber MJ, McGrath B, Shimabukuro-Vornhagen A, Billgren B, Lund TK, et al. Evaluation of intubation and intensive care use of the new Ambu® aScope 4 broncho and Ambu® aView®, compared to a customary flexible endoscope a multicentre prospective, non interventional study. *Trends in Anaesthesia and Critical Care*. 2020;21:35-41.
- [10] Prakash H, Chakrabarti A. Epidemiology of Mucormycosis in India. *Microorganisms*. 2021;9(3):523.

### PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Anaesthesia, University College of Medical Sciences/Guru Teg Bahadur Hospital, New Delhi, India.
2. Assistant Professor, Department of Anaesthesia, University College of Medical Sciences/Guru Teg Bahadur Hospital, New Delhi, India.
3. Senior Resident, Department of Anaesthesia, University College of Medical Sciences/Guru Teg Bahadur Hospital, New Delhi, India.
4. Professor and Head, Department of Anaesthesia, University College of Medical Sciences/Guru Teg Bahadur Hospital, New Delhi, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Michell Gulabani,  
Department of Anaesthesia, UCMS/GTBH, New Delhi, India.  
E-mail: michellgulabani@gmail.com

### AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

### PLAGIARISM CHECKING METHODS: [Jan H et al.]

- Plagiarism X-checker: Aug 01, 2021
- Manual Googling: Oct 01, 2021
- iThenticate Software: Oct 25, 2021 (4%)

### ETYMOLOGY: Author Origin

Date of Submission: **Jul 30, 2021**  
Date of Peer Review: **Sep 04, 2021**  
Date of Acceptance: **Oct 08, 2021**  
Date of Publishing: **Nov 01, 2021**