MANAGEMENT OF THE DIFFICULT AIRWAY WITH A FIBREOPTIC BRONCHOSCOPE: A CASE SERIES

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INTRODUCTION
For an anesthesiologist managing a difficult airway has always been a major concern. Airway related complications are one of the commonest causes for anesthesia related morbidities and mortalities. Poor airway management has been recognized as a serious patient safety concern for almost decades, highlighting the need for careful airway assessment before the induction of anesthesia. Improvements in patient monitoring, airway devices, and clinical protocols and training have reduced the risk associated with a difficult airway, these changes have not reduced the incidence of unexpected difficult airway in clinical practice. Herewith, we present a case series of difficult airway scenarios managed successfully with fibreoptic bronchoscope.

CASE REPORTS
Case scenario 1
A 45-year-old male patient presented with complaints of difficulty in opening mouth since 1 year. He give history of tobacco chewing for last 34 years. His mouthopening gradually start reducing with burning sensation in oral mucosa, mouth opening was nil when he reported to the department. He was diagnosed with Oral submucous fibrosis Group IVa and was posted for bilateral fibrotyom, myotomy, coronoidectomy, extraction of 18,28,38,48 and reconstruction with nasolabial flap. An awake fiberoptic intubation was planned.

The patient was shifted to the operating room, laid in supine position and all standard monitors were attached. Bilateral superior laryngeal nerve block with 2 mL of 2% lignocaine was given at the greater cornu of the hyoid bone and an intratracheal injection of 2% lignocaine was instituted. Nasal decongestant drops were instilled to minimize nasal airway bleed. Just before the fiberoptic bronchoscope (FOB) was inserted, two puffs of 10% lignocaine spray was sprayed onto the posterior pharyngeal wall. FOB was checked and a 7 mm internal diameter (ID) cuffed endotracheal tube (CETT) was threaded over it. The fiberscope was inserted into the right nostril and after negotiating through the upper airway and the vocal cords, the trachea was entered and the carina was visualized. The endotracheal tube (ETT) was then railroaded over the bronchoscope into the trachea. The tube was confirmed by fiberoptic viewing of tube tip inside the trachea and inability to vocalize. The patient withstood the procedure well.

Anesthesia was then induced with propofol 2 mg/kg and vecuronium 0.1 mg/kg and maintained with sevoflurane and fentanyl. The patient parameters were monitored throughout the procedure. The trachea was extubated after adequate reversal was confirmed. A rescue plan with tracheostomy can be considered if the planned modality to secure the airway had to fail.

Case scenario 2
A 35-years male patient presented with limited mouth opening. He was diagnosed as a case of bilateral temporomandibular joint (TMJ) ankylosis and planned to undergo bilateral gap arthroplasty with bilateral coronoidectomy under general anesthesia. In preanesthetic assessment, the patient was otherwise healthy with no comorbid conditions. Examination revealed a total ankylosis with complete immobility of the mandible. The mouth opening (interincisor gap 3 mm) was severely reduced. All laboratory investigations were within normal limits. The patient was counselled regarding the nature of difficult airway and its management options, namely fiberoptic intubation and tracheostomy. Informed consent was taken from the patient.

The patient was shifted to the operating room, laid in supine position and all standard monitors were attached. Bilateral superior laryngeal nerve block with 2 mL of 2% lignocaine was given at the greater cornu of the hyoid bone and an intratracheal injection of 2% lignocaine was instituted. Nasal decongestant drops were instilled to minimize nasal airway bleed. Just before the fiberoptic bronchoscope (FOB) was inserted, two puffs of 10% lignocaine spray was sprayed onto the posterior pharyngeal wall. FOB was checked and a 7 mm internal diameter (ID) cuffed endotracheal tube (CETT) was threaded over it. The fiberscope was inserted into the right nostril and after negotiating through the upper airway and the vocal cords, the trachea was entered and the carina was visualized. The endotracheal tube (ETT) was then railroaded over the bronchoscope into the trachea. The tube was confirmed by fiberoptic viewing of tube tip inside the trachea and inability to vocalize. The patient withstood the procedure well.

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Case scenario 3
A 24-year-old female patient with gross facial asymmetry posted for asymmetry correction with medpore. The patient had a severely restricted mouth opening because of the previous surgery done for temporomandibular joint ankylosis. Airway management was planned with awake fibre optic intubation. The patient was shifted to the operating room, laid in supine position and all standard monitors were attached. Bilateral superior laryngeal nerve block with 2 mL of 2% lignocaine was given at the greater cornu of the hyoid bone and an intratracheal injection of 2% lignocaine was instituted. Nasal decongestant drops were instilled to minimize nasal airway bleed. Just before the fiberoptic bronchoscope (FOB) was inserted, two puffs of 10% lignocaine spray was sprayed onto the posterior pharyngeal wall. FOB was checked and a 7 mm internal diameter (ID) cuffed endotracheal tube (CETT) was threaded over it. The vocal cords were visualized and 1 mL of lignocaine was injected through the port over it and FOB was advanced into the trachea to identify the carina. The endotracheal tube size 7 mm was then advanced over the fiberopticscope into the trachea. The ETT was then connected to the anesthetic breathing circuit and the correct placement of the tube in the trachea was confirmed by bilateral chest auscultation. FOB facilitated tracheal intubation would have been the best alternative modality to rescue the airway if intubation was not achieved.

All patients were hemodynamically stable throughout the airway management scenarios. Both the intraoperative and postoperative periods were uneventful with no significant desaturation episodes requiring active intervention.
DISCUSSION
Difficult intubations are challenging, even for vigilant anaesthetists with years of experience. The main concern with difficult intubation or in cases where intubation fails is how to improvise methods for preventing such cases from becoming catastrophic before or during induction. Thus, providing safe anesthetic care and preventing intubation related injuries remains a critical issue.

Common causes for anticipated difficult airway may include syndromes such as Pierre-Robin, Treacher-Collins, Downs, Klippel Feil, tumors, trauma, and burns, while unanticipated difficult airway may include infections, abscess, Ludwig’s angina, rheumatoid arthritis, temporomandibular joint ankylosis and acromegaly. Many devices and techniques are now available to circumvent the challenges encountered with difficult airway using conventional laryngoscopy. Endotracheal tube guides, different types and sizes of laryngoscope blades, supraglottic airway devices, lighted styles, rigid video laryngoscopes, and indirect fiberoptic laryngoscopes are few options over an exhausting list.

Preoperative evaluations are essential in predicting difficult tracheal intubation, but with highly predicatable tests currently lacking, only 50% of patients are actually found to have a difficult airway.[2] In addition, screening via methods such as Mallampati scores or measurement of thyromental distance lack reliability. A cohort study on the diagnostic accuracy of anaesthesiologists in predicting difficult airways[3] claimed that 93% (3154 out of 3391 anticipated difficult intubations) were actually not difficult, calling into question the accuracy of the anaesthesiologists’ predictions and emphasizing the challenges that are constantly encountered during anesthetic preparation. Guidelines such as the difficult airway algorithm by the American Society of Anaesthesiologists[4] provide strategies that ensure patient safety.

Fiberoptic intubation under spontaneous ventilation remains the choice, in any anticipated difficult airway, considering that laryngoscopic intubation may be difficult and may possibly worsen any difficult airway scenario.[5] Awake fiberoptic intubation has recently gained acceptance with good intubating conditions found in awake patients because they can assist in clearing their own secretions, phonating, or panting.[6]

Kang et al. (2013) presented a case report of managing a TMJ ankylosis posted for spine deformity secondary to ankylosing spondylitis with minimal mouth opening. Awake fiberoptic intubation was conducted successfully and they concluded that fiberoptic bronchoscopic nasotracheal intubation conducted under conditions of awareness reduces the risk of developing hypoxia and pulmonary aspiration and eventually the necessity to perform an emergency tracheostomy in situations of such difficult airway scenarios.[7]

Langeron et al. compared ILMA (intubating laryngeal mask airway) with FOB in a hundred difficult airway patients and concluded that the success rate of tracheal intubation and procedure duration were comparable between both the devices but in an unanticipated difficult airway scenario, the ILMA provides rescue ventilation in 94% compared to 50% offered by the FOB.[8]

Tracheostomy would have been an appropriate option to secure the airway under these circumstances if multistage reconstructive surgery was planned, with challenges of a difficult airway each time and significant risk of prolonged postoperative airway compromise resulting from soft tissue edema. However tracheostomy was not performed due to the single staged surgery, patient’s denial, possible fear of tracheal stenosis, scarring of the anterior neck of the patient. Ideally, a flexible fiber-optic bronchoscope is the alternative choice for tracheal intubation of such patients. A high purchase and maintenance cost of fiber-optic devices has been the cause of unavailability of fiber-optic bronchoscope in operation theatre of resource poor centers.

CONCLUSION
Endotracheal intubation may fail despite impeccable preanesthetic evaluation and preparations. Choosing an appropriate technique for management of both anticipated and unanticipated difficult airway should be executed wisely and precisely with ideal airway devices. Hence, fiberoptic bronchoscope offer a rescue option in various difficult airway scenarios but can be a part of the primary and sole airway management plan in any clinical situation.

REFERENCES
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