CASE REPORT

Difficult airway intubation using fibroscope as flexible lighted stylet

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ABSTRACT
The difficult airway in maxillofacial trauma is one of the most important causes of anaesthesia-related morbidity and mortality and most catastrophes are due to various expected and unexpected difficulties in intubation and ventilation, which is coupled by the emergency in management of such patients. Conventional difficult airway management techniques in such cases often fail due to blood, secretions, distorted and unstable anatomy. We hereby report a difficult airway scenario in a 22 year old man with a maxillofacial trauma using direct laryngoscopy and retrograde techniques for the “can’t intubate, can’t ventilate scenario”. Eventually, successful intubation was achieved with retrograde guidewire guided intubation using fibreoptic laryngoscope as a lighted stylet.

Keywords: Difficult airway, Fiberscope guided intubation, Mandible fracture, retrograde intubation.

INTRODUCTION
Endotracheal intubation, using a classic laryngoscope is a standard basic tool for laryngoscopy, although it has its limitations and complications. Sometimes vocal cords are difficult to observe, especially with laryngoscopy grades III or IV according to the Cormack and Lehane scoring system¹. Despite the availability of a large armamentarium of airway adjuncts in difficult airway techniques, there is still room for improvement. We report a difficult airway in which naso-tracheal intubation was achieved with retrograde guidewire guided intubation using fibreoptic laryngoscope as a lighted stylet.

CASE REPORT
An 22-yr-old Indian male (height 165 cm, weight 58 kg) presented for fixation of multiple compound and displaced mandibular fractures following fall from a moving tractor. Though patient had no other injuries but since he fell on face, his mandible was fractured at three sites, just left to symphysis and at ramus on both sides. Besides this he had laceration of lower part of cheeks, lower lip and skin over chin. He also had multiple broken teeth of which left lower canine was hanging outside through laceration. Oral cavity was full of blood and secretions, jaw was hanging there was no spasm of the massater, part of massater was avulsed on right side. Tongue was swollen and half of it was visible externally, patient had signs of obstruction but he could maintain his airway and was breathing spontaneously (Fig. 1). Patient had no other head or neck injuries and no other major vital organ injury. Computed tomography scan head, neck, thorax and abdomen was normal except for the maxillofacial injuries seen on three dimensional reconstruction face as described above. For this he was referred to our institute. Patient did not have any other medical and surgical comorbidities. He was not under the influence of any drug or alcohol.

As part of our preparation for the management of a difficult airway scenario, extra anaesthesia staff was asked to give support, the surgeon was asked to be on stand-by for a possible tracheostomy, the difficult airway management trolley was obtained to provide us with the “alternative” instruments, and various options for airway management were considered prior to the start of anaesthesia. Though, tracheostomy is airway management of choice maxillo-facial surgeon specifically asked for a nasal intubation keeping tracheostomy as a rescue procedure. We gave inj. glycopyrolate 300 µgm i.m. 30 mins prior to induction and patient was continuously oxygenated by venturie. mask. Xylometazoline was instilled in both the nostrils to vasoconstrict the nasal mucosa and prevent bleeding from the nose. We decided to go for trans tracheal instillation of 2% xylocaine and superior laryngeal nerve block after proper suctioning despite the risk of aspiration if intubation attempts fail for which surgeons and operative team were ready for rescue tracheostomy. Procedure was explained to the patient and he was compliant for treatment. He was asked to raise his finger if he feels excessive and intolerable pain or discomfort and it was decided not to excessively

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sedate the patient and thus to give him tapered doses of analgesic and sedatives. Though patient was nil per orally but still inj. Ondensateron 6 mg i.v. was given. Since ventilation was not possible in this patient so we planned for awake intubation. Awake fibreoptic intubation was not the first option, as the patient was bleeding. During suctioning, blood clots were also seen and removed. Due to this reason retrograde and blind nasal intubation was also avoided. So we planned to go for direct laryngoscopy while patient was still awake. So we gave inj. Fentanyl 125 µgm i.v., inj. Propofol in bolus doses of 10 mg i.v just to provide adequate analgesia and sedation while patient was awake, higher doses of propofol and fentanyl were not given to avoid sedation, which could further lead to collapse of airway and aspiration. To facilitate intubation 10% lignocaine was sprayed over oropharynx. A 7.5 mm cuffed PVC tube was introduced from the left nostril and was progressed through the nasopharynx to the oropharynx, then laryngoscope was introduced gently and it was decided not to exert undue tension but because of distorted anatomy and blood and damaged tissue nothing was visible and since due to above problems fibreoptic was also not possible, we then decided to go for retrograde keeping tracheostomy and cricothyrotomy as rescue measures since the patient had already been given superior laryngeal nerve block and transtracheal lignocaine injection. A guide wire was passed gently which luckily came out of nostril a 7.5 mm size tube was railroaded over the guide wire which could not be passed through the vocal cords and so railroading over bougie was also thought of but bougie also could not be passed finally it was decided to do a thorough suction through the endotracheal tube and try fibreoptic through the endotracheal tube in situ as it was stuck near to larynx. It was decided to use fibroscope as flexible lighted stylet and since the tip of the scope could be manipulated both up down and laterally by changing the angle of fibroscope to 90° we introduced the scope through endotracheal tube in situ and then manipulated using flexible tip. During lateral manipulating the scope it could be advanced easily and a clear halo could be seen over the trachea. During fibroscopy repeated irrigation and continuous suctioning was done to remove blood and debris so that halo is clearly visible while advancing the scope. Now the tube was railroaded but the tube could not be passed so the tube was taken out by slitting the tube leaving scope inside the trachea, thereafter an already slit tube of 6.5 mm was introduced that could be easily railroaded now scope was taken out leaving the slit tube inside and a bougie was passed next over which a normal 6.5 mm ETT was railroaded and placement of tube was confirmed using capnography and bilateral air entry. Patient was induced by inj. propofol and inj. vecuronium was given for muscle relaxation. Once patient was completely relaxed he was put on ventilator on control mode and was taken up for intended procedure by surgeons. Intraoperative period was uneventful and since lots of tissue edema was present, we decided to electively ventilate the patient postoperatively for atleast 24 hrs. So patient was shifted to ICU and was ventilated for 36 hrs and then was extubated successfully.

**Figure 1:** Photograph showing maxillofacial injuries after trauma with endotracheal tube in situ.

**Figure 2:** Three dimensions CT shows multiple fracture of the mandible.

**Figure 3:** After intubation and stabilization of the same patient.

**DISCUSSION**

The difficult airway management depends upon patient factors, the clinical setting, and the skills of the practitioner. Recognition of specific attributes of the difficult airway, knowledge of appropriate techniques, familiarity with various devices, and prompt recognition of failed airway circumstances are necessary for optimal patient outcome. Hypoxia and airway mismanagement are known to contribute up to 34% of pre-hospital deaths in these patients\(^5\). A high degree of suspicion for actual or impending airway obstruction should be assumed in all trauma patients\(^5\). Several studies have shown that 7 to 28% of patients with trauma require definitive airway management in the form of either endotracheal intubation (ETI) or a surgical airway\(^7\). In most cases, the patient undergoing surgery for maxillofacial trauma airway management is a difficult challenge which gets compounded if patient is received as emergency and is unprepared. Managing the airway in an emergent situation poses additional difficulty, resulting from the fact that the time to accomplish the task is short and the patient's condition may deteriorate quickly. Maxillofacial injuries are almost always caused by trauma and following situations can adversely affects the airway management:\(^5\)
1. Posteroinferior displacement of a fractured maxilla parallel to the inclined plane of the skull base may block the nasopharyngeal airway.

2. A bilateral fracture of the anterior mandible may cause the fractured symphyssis to slide posteriorly along with the tongue attached to it via its anterior insertion. In the supine patient, the base of the tongue may drop back, thus blocking the oropharynx.

3. Fractured or exfoliated teeth, bone fragments, vomitus and blood as well as foreign bodies-dentures, debis, shrapnol etc.-may block the airway anywhere along the upper aerodigestive tract.

4. Haemorrhage, either from distinct vessels in open wounds or severe nasal bleeding from complex blood supply of the nose, may also contribute to airway obstruction. These situations should be addressed immediately using various manual and/or instrumental techniques, in accordance with the "A" step in the ABC treatment protocol suggested by the ATLS. Endotracheal intubation should be considered if it was not performed earlier.

5. Soft tissue swelling and edema resulting from trauma to the head and neck may cause delayed airway compromise.

6. Trauma to the larynx and trachea may cause swelling and displacement of structures, such as the epiglottis, arytenoid cartilages and vocal cords, thereby increasing the risk of cervical airway obstruction.

Both decision-taking and performance are impaired at such times. The performance of urgent or emergent intubation is associated with remarkably high complication rates, which may exceed 20%. This is the result of several factors, including repeated intubation attempts, performing direct laryngoscopy without muscle relaxation and lack of operator experience. The maxillofacial trauma patient often presents a problem of difficult mask ventilation and difficult intubation. The trauma usually disrupts the normal anatomy and causes edema and bleeding in the oral cavity. The mask cannot be properly close-fitted to the face, to enable effective mask ventilation. Furthermore, an injured airway may prevent efficient air transferring from the mask to the lungs. The challenge in performing the intubation arises mainly from a difficulty in visualizing the vocal cords with conventional direct laryngoscopy. The oral cavity, pharynx and larynx may be filled with blood, secretions, debis, soft tissue and bone fractures, all of which preclude good visualization of the vocal cords. Various factors that should be taken into consideration i.e. patients consciousness in order to taper the dose of sedatives to preserve the airway reflexes as it gives you time and options to secure airway, spontaneous breathing if present should be preserved in patients with anticipated difficult endotracheal intubation, nature of injury whether involving soft tissue alone or is associated bony injuries that makes mask ventilation almost impossible and endotracheal intubation difficult, blood and secretions makes indirect laryngoscopic methods like flexible fibroscopy and intubation using glidoscope extremely difficult. Blind airway techniques like LMA, combitube are generally unyielding in such circumstances, generally we are left with surgical methods of securing airway in such patients. Fiberoptic laryngoscope can be used as a lighted stylet in all four directions by changing the angle to 90° and checking for localized halo over the trachea and railroadng the the endotracheal tube over the lighted stylet.

REFERENCES