

CASE REPORT

Management of the Difficult Airway —Retrograde Tracheal Intubation

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INTRODUCTION

Maintenance of a patient's airway to allow adequate gas exchange is a fundamental procedure required to manage the conduct of anaesthesia or the patients who are critically ill. In the operating theatres and in the intensive care units, this often involves translaryngeal intubation of the trachea. Difficult or failed intubation is fortunately relatively rare. However when it occurs, it may be life threatening. Proper evaluation and preparation should make the chances of difficulty with airway management less likely, but unanticipated difficult intubation may still occur. The ability to ventilate the patient with a mask can be life saving. Also, it is crucial to be able to evaluate an airway, to have the proper equipment and know various techniques available for the management of a difficult airway. The ability to carry out invasive techniques for securing an airway when caring for patients with difficult airway is also essential. Anaesthesiologists involved in airway management should have a logical and safe plan to be instituted when faced with a patient who is difficult to intubate or a patient who cannot be ventilated.

A case report of difficult airway managed with retrograde tracheal intubation is presented.

CASE REPORT

A lady, 65 years of age, presented with a large anatomical defect (8x5 cm) on the lower part of right side of her face with the tongue visible through it. Her right half of the mandible was missing with collapse of nasal bridge. She was on radiotherapy. She reported to have developed an ulcer on right cheek, 20 years back, which gradually increased in size and had eroded her mandible and cheek. She had lost weight due to difficulty in swallowing. She was diagnosed as a case of adenoid cystic carcinoma and was managed with radiotherapy. She was under the treatment of plastic/reconstructive surgeon who planned for myocutaneous flap

reconstruction of the defect.

PRE-ANAESTHETIC MANAGEMENT:

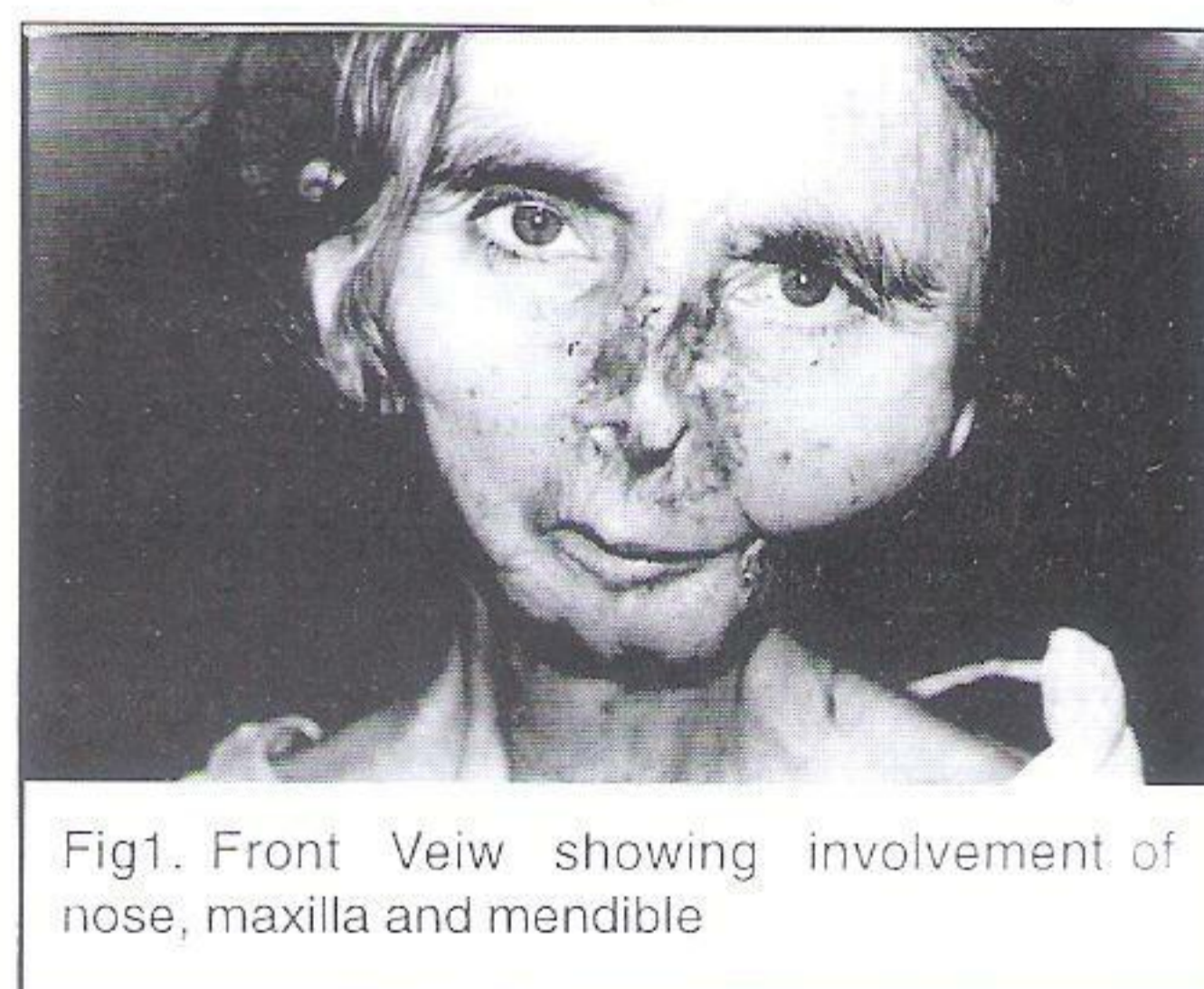
She was a thin, emaciated lady, with no previous history of exposure to anaesthesia and surgery. She had no history of chronic systemic illness and was haemodynamically stable.

She had difficulty in mouth opening and was placed in Mallampatti grade IV. Keeping in view the anticipated difficult in translaryngeal intubation, the possibility of airway access by elective tracheostomy was discussed with the surgeon who requested to adopt an alternative technique as tracheostomy could pose some hindrance in the surgical procedure, and was considered not to be feasible.

The technique of awake retrograde intubation was planned and discussed with the patient who very confidently consented for.

ANAESTHETIC MANAGEMENT

The patient was placed in supine position with the neck extended in head ring. The patient was monitored with ECG, DINAMAP and pulse oximetry. An intrave-



nous access was established and the patient was sedated with 75 micrograms of fentanyl and 5 mg of

midazolam. Cricothyroid membrane was identified and the anterior aspect of the neck was aseptically prepared and draped. The cricothyroid area was infiltrated with 1% lignocaine using a 25 gauge needle. A 14 gauge



Fig2. Side View showing extensive loss of bone and soft tissue.

Photo by Lt Col Muhammad Asghar

intravenous canula was introduced through the cricothyroid membrane. As the location of trachea was confirmed by aspiration of air through the canula, the stillette was removed and 5 ml of lignocaine 2% sprayed in the trachea through the canula. A guide wire was passed through the canula towards the oropharynx. The wire was felt in the mouth by a gloved finger placed through the right cheek defect. The wire was guided with the same finger and directed upwards to come out of the patient's mouth. A 7.5 mm cuffed endotracheal tube was threaded over the guide wire and successfully placed in the trachea. Position of ETT was confirmed and secured. The canula as well as the guide wire was withdrawn and the patient was routinely anaesthetized with the use of intravenous thiopentone and muscle relaxation was achieved with pancuronium. After the surgery was over the relaxant's effect was reversed and the patient was shifted to main intensive treatment center with ETT in place to maintain adequate ventilation and to secure airway from spillage from the operative site. The ETT was removed after 24 hours and the patient was shifted to her ward for follow-up management by her surgeon.

DISCUSSION

Difficult airway is defined as the clinical situation in which a conventionally trained anaesthesiologist experiences difficulty with mask ventilation, difficulty with tracheal intubation, or both.

The purpose of presenting this case is to record the strategies of management of the difficult airway and thus reduce the likelihood of adverse outcome. The principle adverse outcome with the difficult airway includes (but is not limited to) death, brain injury and airway trauma. It has been estimated that inability to successfully manage very difficult airways has been responsible for up to

30 percent of deaths that are totally attributable to anaesthesia¹⁻³.

The literature has not rigorously addressed the ef-



Fig3. Guide wire being threaded through the canula

Photo by Lt Col Muhammad Asghar

facts of the patient preparation and equipment preparation on the outcome. However, there is strong agreement among consultants that preparatory efforts enhance success and minimize risk.

The first and the foremost pre-requisite of adequate preparation for difficult intubation is the recognition and the assessment of the extent of the difficulty. Mallampatti scoring system has been proposed to predict the relative difficulty, by visualizing the pharyngeal structures, e.g., the hard palate, soft palate, uvula and the tonsillar pillars^{4,5}. In patient's with a Class I airway, the laryngoscopic view is Grade I, 100% of the time,^{3,4,6} and in those with a class IV airway, the laryngoscopic view is Grade-III or IV 100 percent of the time.^{3,5}

Other indices to predict the difficult intubation include the space anterior to the larynx (the mandibular space), which measures the distance between the inside of the mandible to the hyoid bone, the thyromental distance, and the atlanto-occipital extension. X-ray examination of the bony structures involved can greatly facilitate the measurements.

The next important thing is to formulate a plan to handle any eventuality. Maintenance of airway and adequate ventilation takes precedence to the hasty and fatal surgical misadventures. The patient must be psychologically reassured, oxygenation maintained at all times, a drying agent; e.g. atropine may be helpful. Finally scrupulous topical anaesthesia and nerve block techniques are essential for the successful awake or retrograde intubation.

The 'American Society of Anaesthesiologists Task Force on Management of Difficult Airway' has identified several fundamental features of preparation that merit consideration.⁷

RECOMMENDATIONS.

1. At least one portable storage unit that contains specialized equipment for difficult airway management should be readily available.
2. If the difficult airway is known or suspected, the anaesthesiologist should :
 - a. Inform the patient of special risks pertaining to the management of difficult airway.
 - b. Ascertain that there is at least one other trained individual available to serve as an assistant in difficult airway management.
 - c. Consider the feasibility of supplemental oxygen administration during the process of difficult airway management.
3. The anaesthesiologist should have a preformed strategy for intubation/ extubation of difficult airway.
4. The anaesthesiologist should evaluate and follow the patient for potential complications of difficult airway management including edema, bleeding, tracheal and esophageal perforation, pneumothorax and aspiration.

A number of techniques have been adopted in the management of difficult airway including awake intubation, blind intubation, fiberoptic intubation, light wand, retrograde intubation and surgical airway access.

The incidence of difficult laryngoscopy or intubation varies from 1.5% to 13% and failed intubation has been identified as one of the common anaesthesia-related causes of death or permanent brain damage.⁸

The technique of locating the laryngeal inlet using breath sounds was attempted on six patients for appropriate management following a failed intubation at the Eldonet hospital in Kenya. Five of the six were successfully intubated. It was still impossible to intubate the sixth patient who required tracheostomy.⁹

Recently a study was carried out in the University of Vermont School of Medicine, Burlington, Vermont by Rosert A Sofferman and his colleagues, who introduced three techniques in the management of difficult airway. These included gum elastic boogie introducers, laryngeal mask airway and oesophagotracheal combitube. Each technique was found very useful in the management of difficult airway.¹⁰

Retrograde intubation, though adopted very rarely in clinical practice, is technically a very easy technique and needs to be advocated in patients requiring airway access in difficult situations. A successful attempt of retrograde intubation was also reported from Agha Khan University Hospital, Karachi, Pakistan.¹¹ It is especially useful where nasal / oral route for intubation is not available and can be the only choice for elective intubation in fasciomaxillary cases, in which whole of the anatomy of the face and mandible is destroyed or distorted. In

my case the whole side of the face and mandible along with soft tissues was eroded. The tongue was bulky and without support of surrounding pharyngeal muscles. So retrograde intubation was planned and successfully accomplished in the awake patient.

I used 16g canula and sterilized guide-wire from a CVP set. This is the most economical and easily available option. Alternatively, Touhy needle can be used to thread the epidural catheter through the cricothyroid membrane and larynx up into nasopharynx from where it can be easily retrieved and used for intubation. . It is less traumatic; the catheter is easy to maneuver through the larynx; but is comparatively expensive.

Nevertheless; the anaesthesiologists must keep all the options for the management of airway open and be fully prepared to use one in case of life threatening situation.

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