

Case Report

Anaesthetic management of a patient with severe post-burn mento-sternal and circumoral scar contractures -a challenging airway

Safiya I Shaikh*, Sarala B. M. and Roopa S.

Department of Anaesthesiology, Karnataka Institute of Medical Sciences, Hubli – 5800022.

*Correspondence Info:

Dr Safiya I Shaikh
Professor and HOD,
Department of Anaesthesiology,
Karnataka Institute of Medical Sciences. Hubli – 5800022
E-mail - ssafiya11@yahoo.com

Abstract

The anaesthetic management of patients with severe post-burn contracture presents many difficult problems ranging from scarce venous access to a difficult airway. Airway management is a challenge to anaesthesiologist owing to contractures and deformity resulting in nonalignment of oral, pharyngeal and laryngeal planes for intubations. Severe post burn neck contracture results in difficult intubation, which can be life threatening and can result in multiple serious complications and sequels. We present the successful anaesthetic management of a patient with severely limited neck extension, fixed flexion deformity and microstomia by awake nasal fibreoptic intubation.

Keywords: Difficult airway management; fibreoptic intubation; fibre optic bronchoscope (FOB); burns contracture

1. Introduction

A difficult airway is defined as the clinical situation in which a conventionally trained anaesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both.¹ Release of post burn contracture poses such a difficult and challenging situation to both the surgeon and anaesthesiologist.

Awake fibreoptic intubation is an essential skill in the management of a patient with a known difficult airway or who has an anticipated difficult airway as found during the airway assessment pre-operatively. Airway management in patients with orofacial and neck burns is often a challenge to the anaesthesiologist. The challenge lies in the restoration of the form and function of this region with safety. Restricted mouth opening, decreased oropharyngeal space, limited atlanto-occipital joint extension, reduced submandibular space compliance and heavily fibrosed neck inevitably leads to difficult airway.²

2. Case Report

A 30 year old female patient weighing 98 kg, American Society of Anaesthesiologists (ASA) Class I had sustained severe orofacial, neck and trunk burns one year before presenting to us. Burns scar was extending from the neck involving chin, face, ears, upper chest and both upper limbs sparing forearm.

On examination, she had severe fibrosis of the anterior neck with a fixed flexion deformity, microstomia with mouth opening equal to the diameter of her index finger and burns involving the nose resulting in fibrosis and obliteration of the left nasal passage. Mallampati examination could not be done due to limited mouth opening and a fixed flexed neck. Thyromental distance could not be assessed as the neck anatomy was grossly distorted. Trachea was deviated to right, was not easily palpable. Apart from these airway findings and obesity; her clinical examination was normal. She was planned for surgical correction of the microstomia, release of the neck contracture, z plasty and skin grafting. (Figure 1)

Figure 1 – Mento Sternal And Circum Oral Contracture

We planned awake nasal fiberoptic bronchoscopy (FOB) and intubation with an alternative back-up plan of release of the contracture and correction of the microstomia under tumescent anaesthesia, followed by direct laryngoscopy intubation if the FOB failed and SOS tracheostomy. During the preoperative visit patient and the relatives were explained about the same and written informed consent was taken for surgical emergency release of the contracture and tracheostomy if the need emerged. A good rapport was established with the patient and the anaesthesia plan was explained.

2.1 Anaesthetic management

2.1.1 Pre-operative preparation: Patient received nebulisation with 2ml 4% Lignocaine half hour before surgery. Difficult airway cart and emergency tracheostomy kit were kept ready. ENT surgeons were standby for tracheostomy.

2.1.2 Intraoperative Management: In the operating room, an 18 gauge intravenous line was secured and standard monitoring was started. Patient was premedicated with inj. Glycopyrrolate 0.2 mg, inj. Ranitidine 50 mg, inj. Ondansatrom 4 mg and inj dexamethasone 8mg intravenously as per protocol .

Preoperative airway preparation was done 15 minutes before procedure with gargles of lignocaine viscus(10%) and lignocaine spray(10%) to the posterior pharyngeal wall and base of the tongue. No regional blocks were used due to distorted anatomy .Nasal decongestion was achieved by instilling 0.1% xylometazoline nasal drops through each nostril. The nasal cavities were lubricated with 2% lidocaine gel. After confirming tracheal position transtracheal inj lignocaine 4% installed and patient was asked to cough.

To facilitate FOB, the operating table was lowered with a 30° elevation of the head end. After preoxygenation with 100% oxygen for 5 min via a secured nasal airway in the right nasal cavity fiberoptic guided intubation was attempted with 6.5mm cuffed portex endotracheal tube mounted on an adult 3.5 mm bronchoscope .Bronchoscopy showed reduced oropharyngeal space, oedematous laryngeal structures and scarring of the epiglottis. Two ml of 2% lidocaine was sprayed on the vocal cords down to the trachea and after waiting for a minute the intubation was done without any difficulty. After confirming their position, the tube was secured. (Figure 2)

Figure 2 – post intubation and neck contracture release

Anaesthesia was induced with propofol 150 mg, fentanyl 120 microgram. Anaesthesia was maintained with oxygen, nitrous oxide IPPV and vecuronium, morphine 4mg and propofol infusion I V. Surgery was completed in 2 hours uneventfully and patient reversed with inj. Neostigmine 0.05mg/kg and inj. Glycopyrrolate 0.08mg/kg IV. Patient was extubated after adequate recovery of spontaneous respiration, muscle tone and power. Postoperatively she was monitored in a Post anesthesia care unit.(PACU)had an uneventful stay and was discharged after 1 week. (Figure 3)

Figure 3 – post surgery and extubation



3. Discussion

Airway management in patients with orofacial and neck burns is often a challenge. Restricted mouth opening, decreased oropharyngeal space, limited atlanto-occipital joint extension, reduced submandibular space compliance and heavily fibrosed scars in the neck lead to a difficult airway.³

Use of standard laryngoscopy was not possible in our case due to non-alignment of oral/pharyngeal axis and presence of limited cervical extension due to fixed flexion deformity. However in patients with extreme deformity the functional and anatomical distortion may be such that all attempts at intubation may fail⁴. Concomitant microstomia in our patient due to facial burn had distorted the local anatomy. Also because of limited mouth opening, the use of supraglottic devices was ruled out. Retrograde intubation was not possible because of the neck contracture. Hence the primary plan for management of our patient was awake FOB intubation with a backup plan of release of contracture under tumescent anaesthesia.

In the post-burn patient, judicious preoperative airway and scar evaluation is mandatory. Measurement of the thyromental distance, the Mallampati score, and the mouth opening (interdental) distance are important clinical assessment data helping to anticipate difficult intubation.⁵ But as in many cases of burns contracture, our patient's face and neck was extremely distorted making measurement of the airway parameters difficult. Preparation for dealing with difficult intubation is indicated in all patients with scarring in the upper thorax, neck, and face.⁶

Fibreoptic intubation, a more recent technology but technically demanding is considered the safest and most effective method in known or suspected cases of difficult intubation. Its primary advantage is that it permits direct visual control of the intubation procedures.⁷ Studies with observational findings indicate that awake fiberoptic intubation is successful in 88–100% of difficult airway patients (Category B3-B evidence).^{5,8-11} Fiberoptic bronchoscopy provides excellent visualization of glottis. Another major advantage of the fiberoptic technique under video guide is that the dynamics of endotracheal tube insertion can be continuously viewed on the screen until intubation is accomplished. If the endotracheal tube fails to enter the trachea directly, it may be manipulated under visual control¹².

The extubation strategy of the difficult airway should be adjusted to the type of surgery, the medical condition of the patient, and the experience and preference of the anaesthesiologist. Availability of appropriate know-how and equipment at the time of, and immediately after, extubation, and preparedness for the possibility of extubation failure will remain the mainstays of any safe extubation strategy.¹³

In conclusion, vigilance and meticulous preoperative preparedness for difficult airway is the key to success.

Spontaneous ventilation may have to be maintained at all times and muscle relaxants avoided. The anaesthesiologist should have multilayered contingency plan to handle the airway. As attempts at direct laryngoscopy are extremely likely to fail in these patients, indirect attempts should be tried first. Proper preoperative and intraoperative planning and team work is necessary for a positive outcome to manage such cases.

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