

Case Report

Successful Anaesthetic Management of a Patient with Post Burn Contracture and Difficult Airway: A Case Report

Mushfiqur Rahman¹, Md. Khalilur Rahman²

¹Associate Professor, Department of Anaesthesia and Surgical-ICU, BIRDEM General Hospital, Shahbagh, Dhaka ²Senior Consultant (Hons), Department of Anaesthesia and Surgical-ICU, BIRDEM General Hospital, Shahbagh, Dhaka

Corresponding Author: E-mail: rahmaanmushfique@gmail.com

Abstract

The Anaesthetic management of patients with post burn contracture release poses many problems to anaesthesiologist. Airway management in such cases is still challenging to anaesthesiologist as the contracture and deformity due to fibrous tissue resulting in non-alignment of oral, pharyngeal and laryngeal planes, makes laryngoscopy and endotracheal intubation very difficult or impossible and this can result in many life threatening and serious complications. We report the successful airway management of a patient with restricted neck extension and fixed flexion deformity by Laryngeal mask airway (LMA) followed by endotracheal intubation.

Keywords: Post burn Contracture, LMA, Difficult Airway

JBSA 2020; 33(2): 107-110

Introduction

Management of airway in patients with orofacial and neck burn contracture is often a challenge to the anaesthesiologist. It is so because of the restricted mouth opening, decreased oropharyngeal space, limited extension at the atlanto-occipital joint, reduced compliance of the submandibular space and presence of fibrosed tissue over the neck¹. The reported incidence of difficult intubation is 5.85%, cannot intubate situation is 0.35% and cannot intubate-cannot ventilate situation is 0.02% and these can be major causes of anaesthesia related morbidity and mortality².

We report the successful anaesthetic management of a patient with severely limited neck movements associated with limited mouth opening by Laryngeal mask airway then followed by direct laryngoscope and endotracheal intubation.

Case Report

A 40 year old male patient weighing 65 kgs ASA grade-I had presented with severe burns over chin (lower jaw), neck and trunk area (35%), of six months duration with fibrosed scar tissue that

was extending from neck involving lower jaw, anterolateral aspect of neck, upper anterior chest wall and upper abdomen. His medical history was not significant. On examination fibrosed scar was present over the lower jaw, anterior neck with a slightly fixed flexion deformity with Mouth Opening < 3 Fingers Mallampati Grading was Grade III³.

Thyromental distance could not be assessed because of distorted neck anatomy. Trachea was not palpable and no extension and lateral Rotation of neck were possible. She was planned for release of contracture and free tissue transfer from forearm to neck. We planned introduced of laryngeal mask airway and release of contracture of neck, then direct laryngoscopic aided endotracheal intubation.

Difficult airway was predicted hence preoperative preparation with necessary masks, airways, endotracheal tubes, laryngeal mask airway (LMA's) [4], stylets, bougie and straight blade laryngoscope were kept ready. ENT Surgeon was available for emergency tracheostomy, if necessary.

Anaesthetic Management

Patient was reassured and was explained about the procedures that were to be carried out and Written Informed Consent taken including for the surgical release of contracture and tracheostomy if required.

Connections were made to the monitors and patient's IV access was secured. An intravenous infusion of Ringer lactate was started. Inj. Ranitidine 50 mg+ Inj. Ondansetron 4 mg+ Inj. Atropine 0.6 mg was given as premedication monitoring included standard 5 lead electrocardiogram, noninvasive blood pressure, oxygen saturation and capnography.



Figure 1: Preoperative photo of the patient



Figure 2: After LMA insetion



Figure 3: ETT intubation after release of neck scar



Figure 4: At the end of surgery

Pre-oxygenation for 5 min with oxygen at 8 l/min by face mask kept closely over mouth opening and testing the beg mask ventilation. After testing of beg musk ventilation Induction with 120 mg of propofol and fentanyl 100mcg was done.

After induction, ventilation became difficult as there was no visible thrust of chest wall movement. However by maintaining sustained pressure with 100% oxygen we could maintain oxygenation of the patient. Saturation was found to be 98% throughout mask ventilation. After one minute, 3 size lryngeal musk airway LMA was introduced by index finger. The cuff was inflated and the LMA was connected to Boyle's machine

via Bain's circuit. The proper position of LMA was confirmed by bilateral auscultation of chest.

Patient was ventilated with a breathing mixture of 4 litres of nitrous oxide, 2 litres of oxygen and 1% Halothane. Surgeon was allowed to proceed and we continued with intermittent positive pressure ventilation. After adequate release of neck scar full range of neck extension was achieved. Later patient was induced with inj. Vecuronium 0.1mg/kg total 60 mg. When adequate relaxation was achieved, removed the laryngeal mask airway and endotracheal intubation was proceeded by ID 7.5mm endotracheal tube.

Anaesthesia maintained with 0.5% Helothane + Inj. Vecuronium on Intermittent Positive Pressure Ventilation. Surgery was completed in 5 hour 30 minutes. Vitals were stable.

At the end of surgery the process of extubation was not expedited and ventilation was continued. We let the patient completely recover. Reversal was done by Neostigmine + Atropine.

After noticing eye opening and obeying commands, suction of the oral cavity was carried out and the patient was extubated. She was observed for another 15 minutes in the operation theatre. Supplementary oxygen was given during this period. Patient was then shifted to post operative ward. Observation was made by monitoring vitals and oxygen saturation. From here on she made uneventful recovery.

Discussion

Post burn neck contracture following burns is a known complication and airway management in such patients offers a challenge. The fixed flexion deformity of head causes difficult Endotracheal intubation as there will be limited oro-pharyngeal space, decreased pharyngeal space, decreased atlanto-occipital extension and submandibular compliance.

Many options are available for intubation in such cases like: awake fiberoptic intubation, Laryngeal Mask Airway, Intubation Laryngeal Mask Airway, Blind nasal intubation, Retrograde intubation, tracheostomy, Release of contracture using tumescent mixture of local anaesthetic but the use of fibre optic intubation is the gold standard when compared to other techniques^{5,6}.

Tracheostomy was not suitable as there was fibrosed tissue over the neck making anatomy distorted. However in patient with extreme deformity the functional and anatomical distortion may be such that all attempts at intubation may fail⁷. Hence the primary plan for airway management of our patient was testing of bag mask ventilation then induced inj. Propofol 120 mg and inj. Fentanyl 100 microgm and airway secured by Laryngeal Mask Airway for contracture release followed by direct laryngoscope and endotracheal intubation. Fiberoptic bronchoscope guide considered as safest and most effective method in known or suspected cases of difficult intubation. The primary advantage of fiberoptic bronchoscope guided intubation is that it permits direct visual control of the intubation procedures.⁷ There are studies indicating the success rate of Fiberoptic Bronchoscope guided intubation of 88-100% in difficult airway patients^{8,9,10,11,12}. Fiberoptic bronchoscopy provides excellent visualization of glottis and the endotracheal tube insertion can be continuously viewed until intubation is accomplished.

Conclusion

Vigilance and pre-anaesthetic meticulous preparation for difficult airway management is the key to successful management of difficult airways. The anaesthesiologist should have multi layered contingency plan to handle the airway. Proper preoperative preparation and intraoperative planning and a team work are always necessary for a successful outcome. Fiberoptic endoscopy was another frequently used technique, but is not available everywhere.

References:

1. Sahajanandhan R, Saravanan PA, Ponniah M, Jacob JI, Gupta AK, Nambi GI. Post-burn contracture neck with extreme microstomia and fibrosed obliterated nose: a unique airway challenge. *Natl Med J India*. 2010 Sep-Oct;23(5):281-2.
2. Crosby ET, Cooper RM, Douglas MJ, Doyle DJ, Hung OR, Labrecque P, Muir H, Murphy MF, Preston RP, Rose DK, Roy L. The unanticipated difficult airway with recommendations for management. *Can J Anaesth*. 1998 Aug;45(8):757-76.

3. S.R.Mallampati. Clinical sign to predict difficult tracheal intubation. *Can J Anaesth.* 1983;30: 316.
4. Brain AIJ. The laryngeal mask – a new concept in airway management. *Br J Anaesth.* 1983;55: 801-805.
5. S.K. Singh, V. Asthana, Y.S. Payal S. Agarwal, D.K. Singh, N.Srivastava Airway Management in fixed flexion deformity using an alternative method of ILMA insertion. *Ind. J Anaesth.* 2008; 52(4):440-442
6. Agrawal S, Asthana V, Meher R, Singh D K Paraglossal Straight Blade Intubation Technique-an Old Technique Revisited in Difficult Intubations: A Series of 5 Cases. *Indian J Anaesth [serial online]* 2008 [cited 2015 Dec 10];52:317-20.
7. Kreulen M, Mackie DP, Kreis RW, Groenevelt F. Surgical release for intubation purposes in postburn contractures of the neck. *Burns.* 1996 Jun;22(4):310-2.
8. Bissinger U, Guggenberger H, Lenz G. Retrogradeguided fiberoptic intubation in patients with laryngeal carcinoma. *Anesth Analg.* 1995 Aug;81(2):408-10.
9. Cohn AI, Zornow MH. Awake endotracheal intubation in patients with cervical spine disease: a comparison of the Bullard laryngoscope and the fiberoptic bronchoscope. *Anesth Analg.* 1995 Dec;81(6):1283-6.
10. Larson SM, Parks DH. Managing the difficult airway in patients with burns of the head and neck. *J Burn Care Rehabil.* 1988 Jan-Feb; 9(1):55-6.
11. Reasoner DK, Warner DS, Todd MM, Hunt SW, Kirchner J. A comparison of anesthetic techniques for awake intubation in neuro-surgical patients. *J Neurosurg Anesthesiol.* 1995 Apr;7(2):94-9.
12. Sidhu VS, Whitehead EM, Ainsworth QP, Smith M, Calder I. A technique of awake fiberoptic intubation. Experience in patients with cervical spine disease. *Anaesthesia.* 1993 Oct;48(10): 910-3.