

*Case Report*

A Case of Post Burn Contracture (PBC) Neck with Oral Sub Mucous Fibrosis- A Unique Challenge in Airway Management

Rajesh V Nagmothe^{1*}, Sanjay S Bule², Naresh G Tirpude^{3*}

¹Assistant Professor, ³Professor and Head,

^{*}Department of Anaesthesia, Government Medical College, Nagpur, Maharashtra, India.

²Associate Professor, Government Dental College, Nagpur, Maharashtra, India.

Corresponding Author: Rajesh V Nagmothe

Received: 18/05/2015

Revised: 16/06/2015

Accepted: 18/06/2015

ABSTRACT

With new advancement in treatment of the acute severely burned patients leads to an increase in number of patients posted for series of reconstructive surgery to treat post burn sequel. Post burn contraction (PBC) neck not only restrict the movement of neck but also leads to restriction in mouth opening, respiratory difficulty, alteration in position of trachea and distortion of cervical spine. Repair of PBC neck taken as a priority as it will help the airway management in subsequent procedure. The oro-facial and anterior neck contracture makes prediction of difficult airway in burn patients challenging, also functional anomalies and comorbid condition like sub mucous fibrosis can be easily missed. Here we are presenting a case of a patient having sub mucous fibrosis with accidental electrical burns involving face, neck, anterior chest wall and both upper limb. The combination of sub mucous fibrosis with PBC neck leading to fix flexion deformity is a unique challenge for airway management.

Key words: Post burn contraction (PBC) neck, difficult airway, sub mucous fibrosis.

INTRODUCTION

Airway assessment and management in patient with post facial and neck burns is always a challenging job. The chances of contractures which are well known sequel after burns remains high and in fact has increased many fold as severely burned patients are surviving after getting advance treatment. ^[1] The post burn sequelae may present in the form of restricted mouth opening, decreased oropharyngeal space, distortion in anatomic alignment of Oropharynx, pharynx and trachea, cervical spine distortion and fixed flexion neck deformity,

inability of atlanto-occipital extension. These sequels pose real challenge in direct laryngoscopy and endo-tracheal intubation. An awake fiber optic intubation remains the gold standard in these conditions but fiber optic bronchoscope not always available in Operation Theater. ^[2]

Here we are presenting a case report of anaesthetic management of 44 years male patient with history of accidental electrical burn one year back with scar on right eyelid, microstomia, PBC on face, neck and fixed flexion neck deformity with history of mild restriction in mouth opening before the incidence of burn.

CASE HISTORY

A 35 years male patient, weighing 65 kg, American Society of anaesthesiologist (ASA) class-I, with history of accidental electrical burn involving face, neck anterior chest wall and both the upper limb one year back. He was managed conservatively and developed post burn contracture involving right eye lid, neck and both the upper limb (figure: 1 & 2). Patient was posted for series of correction surgery for scar release and skin grafting.

On preoperative clinical examination patient was ASA class I with all routine investigations are within normal limit. Preoperative X-ray neck AP & Lateral

view was taken (figure: 3). Due to post burn contraction neck fixed in 30degree flexion deformity. The movement at atlanto-axial joint was not possible. The mouth opening is just one finger (1.5 cm). Patient had contracture in right lower eye lid and both the upper limb. Patient does not give any significant past history except history of tobacco (Ghutaka) chewing which result in the restriction in mouth opening. According to patient history the mouth opening was nearly about 5 cm before the accidental burn injury. High risk written informed consent for anaesthesia, surgery and emergency tracheostomy taken.



Figure-1



Figure-2



Figure-3

Figure: 1- Anterior view of post burn contracture neck showing fixed flexion deformity & restricted mouth opening.

Figure:2- Lateral view of post burn contracture neck.

Figure:3- Anterior & lateral radiological view of neck.

Anaesthetic Management:-

As in this case anticipating difficult intubation, we have detailed preoperative consultation between anaesthesiologist and plastic surgery team. In such case the intubation with help of fiber optic bronchoscope would be the gold standard. [2] But as we do not have fiber optic bronchoscope available with us, we had to plan alternative method. Due to fixed flexion deformity and neck contracture, there was hardly any neck movement possible so blind nasal intubation was also ruled out. Releasing neck contracture under the tumescent anaesthesia with sedation followed by intubation/ LMA insertion for further procedure was thought to be most suitable plan. There were two opinions

about restriction in the mouth opening, according to one opinion the mentosternal contracture caused the limitation in the mouth opening, so mouth opening will definitely improve after the releasing of neck contracture under tumescent anaesthesia. Another opinion was that the restriction in mouth opening was mainly due to sub mucous fibrosis and there won't be any improvement after releasing the neck contracture.

If there was no improvement in mouth opening after releasing neck contracture, LMA insertion may not possible, also laryngoscopy and intubation may prove difficult, in that case airway can manage with micro tracheostomy or jet

ventilation. The team of ENT surgeon kept ready for emergency tracheostomy.

In view of anticipated difficult intubation, difficult intubation try was kept ready, it consists of various size of cuff and plain endotracheal tubes, stylet, LMA no. 3 & 4, intubating LMA, and Gum elastic Bougie, curve and straight(Miller) laryngoscope blade, McCoy Blade, various size of nasal and oral airway, jet ventilator and mini tracheostomy set kept ready. ENT surgeon kept ready for emergency tracheostomy.

On preoperative day patient was review again, explain in detail the procedure involve in airway management. The patient was kept nil by mouth overnight and tab diazepam 10 mg and tab ranitidine 150mg given at night and 6 am on day of surgery. On arrival of patient in Operation Theater, case paper and Consent was checked. Multipara monitor with ECG, SpO₂, NIBP and ETCO₂ attached and baseline parameters recorded. Intra venous line taken in right upper limb. Patient was pre oxygenated with 100% oxygen on mask and pre medicated with Inj. Glycopyrolate 0.2 mg, Inj. Midazolam 1 mg, Inj. Fentanyl 60 mcg. Inj Dexmedetomidine 30mcg given over 10 min and infusion started at rate of 1mcg/kg/hrs. Under the tumescent anaesthesia, [3,4] plastic surgeon releases the post burn contracture.

After releasing the neck contracture, neck extension was possible but there is only mild improvement in mouth opening, mouth opening was restricted to 2.5 cm inter incisor gap. As patient was well sedated and can easily ventilated on mask, plane of anaesthesia was deepen with gradually increasing concentration of sevoflurane. Intravenous suxamethonium was avoided due to history of burn. Under deep plane of anaesthesia there was no further improvement in mouth opening so it was not possible to insert LMA. Direct laryngoscopy done with great difficulty using No 4 curve

blade, the laryngeal view was Cormack and Lehane grade 4 with external manipulation. Gum elastic Bougie introduced and cuff endo tracheal tube no. 7.5 pass over it.

Tube placement in trachea confirmed with ETCO₂ monitor, air entry checked and equal on both side and tube fixed. Intraoperative course was uneventful and patient extubated at the end of surgery, post operative period was uneventful.

DISCUSSION

Post burn contracture of face and neck cause functional limitation and aesthetic disfigurements. Airway management in patient with PBC of face, neck and anterior chest wall is most challenging problem in reconstructive surgery. Preoperative airway assessment is difficult in this case. The normal anatomy of upper airway may be distorted by underlying dense fibrous hypertrophic scar. Range of cervical spine mobility may get limited and sniffing position may not possible due to severe mentosternal contracture. Dr PK Gupta et al in his study for assessment for difficult laryngoscopy found that when the Maxillo-pharyngeal angle is < 90 the difficulty in direct laryngoscopy was comparable to Cormack and Lehane classification III and IV. [5] Decrease in atlanto occipital distance on lateral cervical radiograph is also one of important indicator for difficult laryngoscopy. The measurement of thyromental distance, Mallampati score and mouth opening are important clinical assessment for anticipating difficult intubation. The airway must be evaluated in sitting position only avoid examination in supine or semifowler's position. In addition to this assessment, anaesthesiologist should carefully examine the scar and contracture, paying special attention to the perinasal and oral orifices. [6] Mentosternal contracture may limit the mouth opening and atlanto axial extension. As in our case this may lead to difficult to assess the restriction in mouth

opening due to co morbid condition like sub mucous fibrosis.

Fiber optic bronchoscope has been proved as gold standard for difficult intubation with significant advantage of being flexible and allowing continuous visualization of structure and have high success rate. [7] As securing the airway is crucial aspect during the reconstructive surgeries of patients with post burn contracture face, neck and anterior chest wall proper preoperative planning is must. Three basic considerations before induction of general anaesthesia are where to use an awake intubation, under anaesthesia or percutaneous technique. The basic principle involve in the process of airway control in the patient with difficult airway is the preservation of spontaneous ventilation till the airway is properly secured. The main challenge to anaesthesiologist in these patients is of airway control. It was also important that the attending plastic surgeon understood the complementary role he had to play in maintaining the airway. [8] Surgeon may need to release the contracture around neck, oral orifices under ketamine or tumescent anaesthesia and after achieving the neck extension the endotracheal intubation can be done.

CONCLUSION

Awareness, vigilance and preparedness, teamwork between anaesthesia and surgical teams are the key to successful management of airway in post-burn patients. Preoperative judicious evaluation of the scar and airway is mandatory. It is important to keep in mind that underlying functional and anatomical alterations and comorbid condition may lead to extreme difficulty for endotracheal

intubation. Proper preoperative evaluation and planning will help to successfully secure the airways of post-burn patients with anticipated difficult intubation and reduce anaesthetic morbidity and mortality.

ACKNOWLEDGEMENT

We sincerely thank the Department of Anesthesia, Government Medical College, Nagpur, Maharashtra state.

REFERENCES

1. Saygin Abdul –Karim Mohammed. The post Burn flexion neck Contracture. Tikrit Medical Journal 2007;13(1):116-121.
2. Tae –Hyung Han, Hana Teissier et al. Managing difficult airway in patient with post-burn mentosternal and circumoral scar contractures. Int.J Burn Trauma 2012;2(2):80-85.
3. Pawan Agarwal. Safe method for release of sever post burn neck contracture under tumescent local anaesthesia and ketamine. Indian J Plastic Surg January-June 2004;37 (1):51-54.
4. Saraf S, Goyal P, Ranka P. Tumescent anethesia: A useful technique for harvesting split-thickness skin graft. Indian J Dermatol 2004;49:184-6.
5. Gupta K, Gupta PK. Assessment of difficult laryngoscopy by electronically measured maxillo-pharyngeal angle on lateral cervical radiograph: A prospective study. Saudi J Anaesth 2010;4:158-62.
6. American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology 2003 May;98(5): 1269-77.
7. 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! J Anaesth Clin Pharmacol 2010;26(2):267–9.
8. Abiodun Oyinpreye Jasper. Anaesthetic management of post burn contractures, a recurrent challenge from oil pipe line vandalization in Nigeria: case report. Case Journal 2009;2:9141.

How to cite this article: Nagmothe RV, Bule SS, Tirpude NG. A Case of post burn contracture (PBC) neck with oral sub mucous fibrosis - A unique challenge in airway management. Int J Health Sci Res. 2015; 5(7):473-476.
