Anesthetic management of post-burn contracture chest with microstomia: Regional nerve blocks to aid in intubation

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Abstract

This case report exemplifies the anesthetic technique of blocking bilateral infraorbital and mental nerves for release of contractures of mouth. A 30 year old female patient of post-acid burn contractures of chest wall and mouth was scheduled for contracture release and skin grafting. Airway assessment revealed severe restriction of mouth opening with limited restriction of neck movements. Contracture release of mouth conducted by blocking bilateral infraorbital and mental nerves, which facilitated intubation easily. This case report highlights the practical advantage of nerve blocks for release of contracture mouth, in case of anticipated difficult airway, over other conventional methods.

Key words: Airway, contractures, nerve blocks

Introduction

Given the increased incidence of survival of burn patients, those with post-burn contractures may present for anesthetic care. We describe the anesthetic technique – use of regional nerve blocks for release of perioral contractures, followed by general anesthesia for release of chest wall contracture and split skin grafting.

Case Report

A 30-year-old female patient weighing 47 kg was admitted with post burn contractures of mouth and anterior chest wall, scheduled for microstomia correction, chest wall contracture release and skin grafting. She had suffered acid burns 3 months earlier, treated in a local hospital with repeated dressings. Her mouth opening is narrow. Her feeding and breathing were not affected.

Her vital signs were as follows:
Blood pressure 106/70 mmHg pulse rate 90/min respiratory rate 20/min CVS/RS: Were unremarkable
Hemoglobin was 10.7 g/dl, serum K 3.5 mEq/l and serum proteins were normal.
Electrocardiogram, chest X-ray posteroanterior view, blood urea, serum creatinine, random blood sugar were normal.

On physical examination of the airway, she had cicatrized angles of the mouth, which made mouth opening inadequate. Inter-incisor distance was 2 cm, whereas Mallampatti assessment was class IV [Figure 1]. Neck anatomy was normal, but had limited restriction of flexion/extension. Difficult airway was predicted hence preoperative preparation with necessary masks, airways, endotracheal tubes, laryngeal mask airway (LMA’s), styles, bougie and straight blade laryngoscope were kept ready. Surgeon was available for emergency tracheostomy, if necessary.

Patient was premedicated with injection ondansetron 4 mg, ranitidine 50 mg and atropine 0.5 mg after obtaining a venous access with 18 G cannula. Patient was connected to the standard anesthesia monitors and sedated with injection midazolam 1 mg and butorphanol 1 mg intravenously (I.V.).
The anesthesia plan was initially a regional block for contracture release and widening of the mouth, followed by a general anesthetic for the chest contracture release and skin grafting part of the procedure. Procedure was explained to the patient preoperatively. B/L infra orbital and mental nerves were blocked with 0.5% bupivacaine. The surgeon was asked to proceed with release of oral contractures. After hemostasis had been secured, the mouth opening became wider with an inter-incisor distance of 4 cm. Patient was still conscious and comfortable through the procedure [Figure 2]. Subsequently anesthesia was induced with injection thiopentone (5 mg/kg) endotracheal intubation was facilitated by injection suxamethonium 2mg/Kg I.V. Although mouth opening became easier at this stage, laryngoscopic view became Cormack and Lehane grade 2. A size 7.0 endotracheal tube was passed orally with the help of stylet and cuff was inflated. Anesthesia was maintained with oxygen/nitrous oxide/muscle relaxant/isoflurane technique. Hemodynamics remained stable, and oxygen saturation was between 98% and 99% throughout the procedure. Contractures were released, and split skin grafting carried out. Surgery lasted for 2 h. Blood loss was about 600 ml and a unit of packed cells transfused. At the end of the procedure, neuromuscular blockade was reversed, trachea subsequently extubated, and patient was shifted to postoperative Intensive Care Unit.

**Mental nerve**

Blockade of the mental nerve as it exits the mental foramen provides anesthesia to the lower lip and chin. The mental foramen lies in a vertical line connecting the pupil of the eye with the foramen of peripheral nerves. The foramen is palpated in the mandible, and a 25 G 3 cm needle is inserted inferomedially. Infiltration of 2-4 ml of 0.5% bupivacaine is sufficient.

**Discussion**

The patient presented with late complication of burns, that is, contractures. The primary concern to the anesthesiologist is the potential risk of the difficult airway. It is also important that the attending plastic surgeon understood the complimentary/contributory role, he had to play in maintaining and securing the airway, if necessary. It was also decided that failing successful ventilation and intubation, an emergent tracheostomy be the last resort for securing the airway.

The contractures of the mouth caused a potentially difficult airway in a patient under review by limiting the mouth opening.[4,5] Although the longitudinal alignment of oral, laryngeal and tracheal axes was still possible, this distortion limited access to the glottis. Difficult airway increased the risk of anesthesia with the possibility of hypoxia and increased morbidity and mortality. It is, therefore, a challenging aspect of anesthesia practice.

**Different ways of securing the airway in post-burn contracture cases:**

- Inhalational anesthesia with volatile agents
- Surgical release of contracture with Ketamine as a sole agent or along with tumescent anesthesia[6]
- Intubation with help of special airways (William/Berman’s airway)[4] or devices fiberoptic bronchoscope (FOB/LMA)[7]
- Video laryngoscope assisted intubation
- Surgical – cricothyrotomy/tracheostomy

![Figure 1: Preoperative photo of the patient](image1)

![Figure 2: Photo of the patient after correction of microstomia under regional block](image2)
The basic principle involved in the process of airway control in a patient with difficult airway is the preservation of spontaneous respiration – achieved by inhalational induction or with ketamine, with chances of vomiting and aspiration.

Nasal intubation with FOB is of great value in many cases, but relies greatly on the skill and experience of the operator and can be time-consuming. The equipment is not only complex but also expensive and is not available in many centers.

Laryngeal mask airway is safe for patients with low risk of aspiration and its role in difficult airway is firmly established. Its use in this particular case is limited, because of microstomia.

Videolaryngoscope could be of help in such cases, but the equipment is not available in our center.

**Conclusion**

Regional nerve blocks as is done to facilitate easy intubation, in this case of burn contracture with microstomia has many advantages:

1. Safe, simple and quick. 2. Preservation of protective airway reflexes – prevents aspiration. 3. No muscle relaxants — no question of failed ventilation and intubation. 4. Patient conscious and cooperative 5. Can be tried in centers where FOB/video laryngoscope not available.

Of course, there are many methods of airway management in patients with burn contracture with microstomia. This method of securing the airway by blocking the infraorbital and mental nerves for correction of microstomia and later intubation is advantageous as the patient is conscious with protective reflexes intact and minimal risk of aspiration. Hence, this method can be listed for airway management in burn contracture cases with microstomia especially in peripheral centres with limited availability of advanced equipment.

**References**

1. Jasper AO. Anaesthetic management of post-burn contractures, a recurrent challenge from oil pipeline vandalization in Nigeria: A case report. Cases J 2009;2:9141.
2. American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Practice guidelines for management of the difficult airway: An updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology 2003;98:1269-77.
3. Wedel DJ, Horlocker TT. Nerve blocks. In: Miller RD, editor. Anaesthesia. 7th ed. Philadelphia: Churchill Livingstone; 2010. p. 1662-4.
4. Kaur K, Taxak S, Hooda S, Chowdary G, Johar S. Airway management of Post burn contracture neck – An anaesthesiologist's challenge. Egypt J Anaesth 2012;28:233-6.
5. Sahajanandhan R, Saravanam PA, Ponnaiah M, Jacob JL, Gupta AK, Nambi GL. Post burn contracture neck with extreme microstomia and fibrosed obliterated nose – A unique airway challenge! J Anaesth Clin Pharmacol 2010;26:267-9.
6. Pawan A. Safe method for release of severe post burn neck contracture under tumescent local anaesthesia and Ketamine. Indian J Plast Surg 2004;37:51-4.
7. Ovassapian A, Yelich SJ, Dykes MH, Brunner EE. Fiberoptic nasotracheal intubation — Incidence and causes of failure. Anesth Analg 1983;62:692-5.

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