Case Report

Emergency airway management in a patient with facial trauma: Combining clinical judgment and skill with fortuity

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ABSTRACT

Airway management in maxillofacial trauma is a challenging task. Distorted anatomy leading to difficult face mask ventilation and intubation requires clinical expertise in emergency scenarios. Planning and managing such challenging airways in a timely manner requires the utmost cooperation from the patient. Here, we present a case of self-inflicted facial gunshot injury that was posted for surgical tracheostomy followed by facial wound exploration and repair. Uncooperative behavior and irritability of the patient were toppings to the difficult airway, however, timely clinical judgment and replanning according to the case requirement contributed to the successful airway management during emergency hours.

Key words: Anesthetic challenges, Difficult airway, Facial gunshot

Management of maxillofacial trauma requires coordinated management between anesthesiologists, trauma surgeons, and maxillofacial surgeons. Airway and respiratory parameters are the most common critical care errors for "in-hospital trauma patients" morbidity and mortality [1]. While managing a difficult airway in emergency situations, decision-making according to clinical judgment and performance is of paramount importance. Teamwork, airway management planning, and skilled performance can reduce the complication rate. Patient cooperation is the key essence to successful difficult airway management while awake. Intravenous sedation in a sitting position has not yet been described in the literature.

CASE REPORT

A 52-year-old man was brought to our emergency department with an alleged history of shooting himself by placing a gun under his chin approximately 4 h ago. Primary and secondary surveys were conducted in accordance with advanced trauma life support guidelines.

The patient was conscious, oriented, and spontaneously breathing on room air in a sitting position (Fig. 1). Airway examination revealed extensive soft-tissue injuries on the left side of the face with diffuse edema of the oral cavity. The nasopharyngeal airway (NPA) was placed to ensure airway patency. Respiratory pattern and rate were normal with an unremarkable auscultation. The patient was hemodynamically stable with a Glasgow Coma Scale score of 15/15.

Computed tomography (CT) face (Fig. 2) revealed left Le fort 1, 2, 3, and right Le fort 1, 2 fractures, fractures of hard palate, left and right ramus, left body and condyle of mandible, and nasal bone fracture. CT cervical spine, CT angiography, and contrast-enhanced CT torso and brain were normal.

A decision for surgical tracheostomy under local anesthesia followed by primary facial reconstruction under general anesthesia was taken. Informed written consent was obtained and the patient was wheeled to the operation theater (OT) in a sitting position with NPA *in situ*. His vital parameters recorded in OT were a heart rate of 110 beats/min, non-invasive blood pressure of 170/100 mmHg, and SpO_2 of 100% on room air. In view of the extensive deconstruction of the face, the preferred approach for safe management of the airway was surgical tracheostomy under local anesthesia with maintenance of spontaneous respiration followed by definitive surgery under general anesthesia. However, the patient developed difficulty in breathing and became restless due to the pooling of collected blood and secretions downward thus obstructing the airway in the supine position. The plan of anesthesia was changed to "check laryngoscopy" followed by orotracheal intubation due to the unavailability of the flexible fiberoptic bronchoscope

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Figure 1: Self-inflicted facial gunshot wound: Front and lateral view

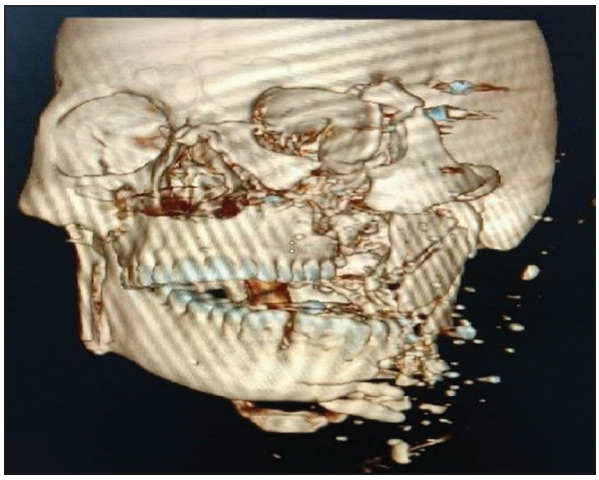

Figure 2: Three-dimensional computed tomogram reconstruction of head and neck

(FOB) in emergency hours. Nasal prongs were applied for peri-procedural oxygen supplementation. To make the patient calm and cooperative, intravenous (IV) sedation was initiated while the patient was in a sitting position with manual support by the support staff of the OT. The airway was cleared by thorough oral suction, and IV dexmedetomidine was administered in a maintenance dose of 0.5 mg/kg/h (mcg/kg/h). Further, supplementation was done by IV midazolam 0.5 mg and IV fentanyl 50 mcg. Once the patient became calm, he was made supine without any difficulty. A 10% lignocaine spray was then used for topical anesthesia of the airway. Propofol 30 mg IV was then administered in graded doses, followed by "check laryngoscopy" using a C-MAC© video laryngoscope (Karl Storz). Vocal cords were visualized after thorough oropharyngeal suctioning. As soon as a good glottic view was obtained, 50 mg of propofol and 100 mg of suxamethonium were administered. The trachea was intubated in a single attempt with an 8-mm cuffed endotracheal tube, and the position was confirmed by end-tidal carbon dioxide. A nasogastric tube was placed through NPA, and then, the NPA was removed. Surgeons proceeded with surgical tracheostomy, debridement, and repair. The post-operative course of the patient was uneventful.

DISCUSSION

Maxillofacial trauma requires coordinated and close-loop communication between various specialties. Anesthesiologists need to be skilled and familiar with the available equipment and techniques to expedite airway management. Emergent situations pose additional difficulty as the patient's condition may deteriorate rapidly. The decision-making and performance are usually affected in such emergent scenarios [2].

A compromised airway is a serious consequence of all gunshot injuries to the face, either due to direct or indirect injury to the airway. Tissue injury and edema of the airway invariably add to the difficulty of the airway. In addition, the airways are profoundly weakened by anterior mandibular fractures and muscle attachment loss. The primary and fundamental measures must be to prevent posterior airway collapse by manual repositioning of the fractured mandibular segments and tongue base. Nasopharyngeal and oropharyngeal airways provide temporary relief. Endotracheal intubation is the established standard approach in emergency situations [3]. This, however, presents challenges due to the edema, bleeding, avulsed soft tissues, and patient positioning that may possibly block the airway [4].

Thorough and rapid airway evaluation, along with the patient's hemodynamic condition, help in outlining the airway management plan. Numerous airway devices and strategies have been developed to improve the visualization of glottis.

Due to the limited space in the mouth, laryngeal masks (LMAs), and supraglottic airway devices, insertion becomes difficult, which may cause further damage, and the risk of aspiration remains. Another option for emergency endotracheal intubation of a patient with a maxillofacial injury is intubating LMA. The final option is direct access to the trachea by performing a cricothyroidotomy or a tracheotomy [5]. The use of FOB, however, in maxillofacial trauma is limited due to obscured vision caused by blood, secretions, and debris. Furthermore, trauma patients are not cooperative enough to allow awake FOB-guided intubation [6]. Reddy *et al*. described the safe and effective use of video laryngoscopy-assisted fiberoptic intubation technique in self-inflicted maxillofacial gunshot [7]. Fabich *et al*. reported the successful airway management of a case of maxillofacial trauma in a high-Fowler's position using video laryngoscopy [8].

Surgical airway is the preferred technique in patients with extensive maxillofacial trauma who may require maxilla-mandibular fixation and post-operative mechanical ventilation. However, surgical access under local anesthesia in an agitated and restless patient who is unable to lie down is challenging. It is uncomfortable and painful for post-traumatic patients, who are already experiencing pain and anxiety [9,10]. The preferred comfortable position for these patients is the sitting position only [8]. In our patient, the airway was cleared with suction, and simultaneous oxygenation was provided by nasal prongs in the sitting position. Dexmedetomidine was initiated for anxiolysis. These steps enabled us to achieve calm and responsive patients. Although ketamine is advantageous in these difficult airway

circumstances where spontaneous breathing is required, it was not used in our case due to the patient's agitation and persistently higher blood pressure readings.

The use of topical anesthesia with lignocaine and sedative doses of propofol for check laryngoscopy was extremely helpful to build up our confidence to deepen the plane of anesthesia and perform endotracheal intubation on the first attempt.

CONCLUSION

Thorough assessment, close-loop communication, critical decision-making, and meticulous preparation are essential parts of the successful and timely management of a traumatic difficult airway. This case highlights the importance of the patient's cooperation while managing the difficult airway. Safe and effective alterations in anesthesia techniques to secure the airway in emergency maxillofacial gunshot wounds can significantly reduce the catastrophe.

REFERENCES

1. Garcia A. Critical care issues in the early management of severe trauma. Surg Clin North Am 2006;86:1359-87.
2. Barak M, Bahouth H, Leiser Y, Abu El-Naaj I. Airway management of the patient with maxillofacial trauma: Review of the literature and suggested clinical approach. Biomed Res Int 2015;2015:724032.
3. Sharma LC, Jose MA. Gunshot injuries of the maxillofacial region. In: Oral and Maxillofacial Surgery for the Clinician. Berlin: Springer Nature Singapore; 2021. p. 1267-81.
4. Jose A, Nagori SA, Agarwal B, Bhutia O, Roychoudhury A. Management of maxillofacial trauma in emergency: An update of challenges and controversies. J Emerg Trauma Shock 2016;9:73-80.
5. Saini S, Singhal S, Prakash S. Airway management in maxillofacial trauma. J Anaesthesiol Clin Pharmacol 2021;37:319-27.
6. Apfelbaum JL, Hagberg CA, Caplan RA, Blitt CD, Connis RT, Nickinovich DG, *et al.* 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 2013;118:251-70.
7. Reddy A, Bansal R, Kaloria N, Patel S, Gowda PK. Utility of the awake video laryngoscopy assisted fibreoptic intubation technique in maxillofacial gunshot injury - a case report. Ann Maxillofac Surg 2023;13:120-2.
8. Fabich RA, Franklin BT, Langan N. Definitive management of a traumatic airway: Case report. Mil Med 2020;185:e312-6.
9. Cooper S. We need to cut the neck!: Confronting psychological and moral distress during emergency cricothyrotomy. Narrat Inq Bioeth 2013;3:E5-9.
10. Greenland KB, Acott C, Segal R, Goulding G, Riley RH, Merry AF. Emergency surgical airway in life-threatening acute airway emergencies--why are we so reluctant to do it? Anaesth Intensive Care 2011;39:578-84.

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