CASE SERIES

Airway challenges in maxillofacial injuries and anterior neck

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Abstract

Maxillofacial and penetrating neck traumas pose significant airway challenges due to anatomical distortion and increased risk of obstruction. This case series highlights the importance of prompt assessment, interdisciplinary coordination, and use of advanced airway techniques such as video laryngoscopy to ensure safe airway control in complex trauma cases, to ensure safety of the patients.

Keywords: Maxillofacial Trauma, Difficult Airway, Video Laryngoscope

Introduction

Trauma to the maxillofacial region and neck, complicates airway management due to disrupted anatomy, bleeding, and tissue damage. Rapid evaluation and stabilization, often requiring a multidisciplinary approach, are essential; any delays can result in rapid deterioration. Standard assessment methods like Mallampati grading are often not possible due to pain, structural damage, or altered mental status. A step wise team approach using strong communication and global mental model facilitated by definitive airway management in maxillofacial injuries and neck trauma is required [1]. Maintaining airway being top priority, along with immobilization of cervical spine [2]. Securing the airway is complex and crucial requiring co-operation between anaesthesiologist, surgeon, and trauma physician [3]. Anesthesiologists must rely on clinical judgment, adaptable techniques, and advanced tools such as video laryngoscopes and awake intubation strategies.

Case 1: Severe facial trauma following animal attack

A case of 50-year-old male with severe midfacial injury and mandibular disruption from an animal attack with a classical presentation of "cannot ventilate and cannot intubate" scenario. Patient presented with extensive loss of facial tissue and exhibiting signs of hypovolemia. Our primary concern was high risk of aspiration and the impossibility of effective mask ventilation.

Airway strategy

Awake video laryngoscopy was selected as the first-line approach to visualize the glottis before induction, patient was counselled and oxygen was insufflated. Lignocaine (10%) was sprayed and mild sedation was administered, C-MAC video laryngoscope with blade size 3 was chosen; mandibular instability made it even more difficult. Multiple attempts were made, bloody field made the visualization poor. Upon visualization of the epiglottis, sedation was cautiously administered using intravenous propofol (30 mg), ketamine (30mg) and fentanyl (50 mcg). Anaesthetic plane was deepened, then a bougie was carefully introduced under direct vision, and 7 mm flexo metallic endotracheal tube was successfully railroaded over it into the trachea. Tube placement was confirmed with capnography; anaesthesia was maintained with oxygen: air: sevoflurane: atracu-

rium. The patient was hemodynamical maintained with adequate fluid and blood. The tube was kept in situ and extubated the following day.

Case 2: Paediatric mid facial injuries from road traffic accident (RTA)

Managing a traumatized child, especially with midfacial injuries, adds layers of complexity. This 8-year-old's extensive nasal and maxillary disruption made conventional mask ventilation impossible.

Airway strategy

Conventional mask ventilation and intubation was deemed impractical, hence using video laryngoscopy (C-MAC blade size 2) was again our chosen path. Providing counselling to the child was challenging, and administering sedation required careful judgment, as there was a genuine risk of compromising the airway. The surgeon remained prepared to establish a surgical airway if necessary. Minimal sedation using ketamine (1 mg/kg) along with glycopyrrolate 5 mcg, combined with 10% lignocaine spray, helped suppress airway reflexes while maintaining airway patency. Insertion was challenging though, due to anatomical instability and bleeding. The critical takeaway here is the importance of having the surgical team ready for an immediate surgical airway as a backup. This highlights the vital "plan B". As soon the epiglottis was visualized, injection propofol 1 mg/kg and fentanyl 1 mcg/kg was given to deepen the plane and cuffed 5.0 mm endotracheal tube was passed. Tube placement was confirmed with end-tidal CO_2, maintained with oxygen: air: sevoflurane: atracurium. This child was ventilated until she was hemodynamically stable and extubated.

Case 3: Penetrating neck injury with retained foreign body

This 26-year-old man, with a motorcycle brake handle embedded in the anterior neck, presented a different but equally complex and demanding situation. The foreign body's interaction with phonation immediately flagged potential laryngeal or tracheal involvement

Airway strategy

Our strategy here revolved around meticulous assessment and multidisciplinary collaboration. Given his stable vitals, we had the luxury of a controlled approach. A multidisciplinary airway plan was developed use of a Blade 3 C-MAC video laryngoscope along with lignocaine spray and mild sedation with injection fentanyl 70 mcg and propofol 50mg. After confirmation of no internal injuries, anaesthetic plane was deepened and orotracheal intubation was performed with a 7.5 mm tube, confirmed via capnography maintained with oxygen: air: sevoflurane: atracurium. The surgical team then safely removed the foreign object, repaired tissues, and the patient was extubated without complication. This case underscores the importance of a calm, coordinated effort when a foreign body is involved, prioritizing imaging and surgical readiness.

Discussion

The key lessons and best practices drawn from these cases of maxillofacial and neck trauma management lie in the importance of adaptability. Standard airway assessment is often unreliable; we cannot depend on them. Anatomical distortion makes mask ventilation incredibly difficult, increasing the risk of obstruction [4]. Endotracheal intubation remains the gold standard for ventilation but supraglottic airway devices have been replacing endotracheal tubes in many scenarios but it's difficult to replace them in traumatic airway [5]. The availability of video laryngoscopy during surgical mission would prove as a game changer [6]. Its indirect visualization capability, even with limited mouth opening or active bleeding, significantly improves our chances of

successful intubation. They enhance intubation success rate and reduces complication, particularly in difficult airway [7] .They also have higher first pass success rate in difficult airway [8]. Fibreoptic bronchoscopy, while excellent, can be severely hampered by blood, as noted in this series. Surgical airway readiness is non-negotiable. We must always have the option of a surgical airway (cricothyroidotomy) as a rapid rescue. Interdisciplinary collaboration with surgeons, emergency physicians, and radiologists is essential for optimal patient outcomes. Above all, awake intubation remains a fundamental technique in airway management, alongside the use of various other devices [9]. Delaying here is simply not an option; a patient's condition can deteriorate alarmingly fast [10]. Careful sedation management is paramount and must avoid over-sedation that could lead to airway collapse. Smaller endotracheal tubes often offer better manoeuvrability in distorted anatomy and minimize further trauma. Overall interdisciplinary collaboration and rapid decision-making are vital.

Conclusion

Successful airway management in maxillofacial and neck trauma hinges on a multidisciplinary, proactive, and highly adaptable approach.

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