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Face-to-face awake intubation in an upright position in severe maxillofacial trauma

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Abstract:

Maxillofacial injury may cause difficulty during airway assessment and management in the emergency setting. Alternative intubation positions and techniques should be considered to ensure patient safety. A 37-year-old male patient arrived at the emergency department with a degloving maxillofacial injury after a high-impact motor vehicle accident. Active bleeding from his wounds prevented him from lying supine and raised concerns of aspiration, requiring immediate securing of the airway. Since the patient was alert and cooperative, awake face-to-face intubation in the upright position was performed. Intubation was successful on the first attempt without any complications using a video laryngoscope with topical anesthesia sprayed intraorally. Awake intubation in the face-to-face upright position can be successful in a cooperative patient with severe maxillofacial trauma.

Keywords:

Airway management, awake intubation, emergency room intubation, face-to-face intubation, maxillofacial injuries

Introduction

Maxillofacial trauma requiring emergency intubation has a risk of complications due to the limited time for assessment and appropriate planning for securing a difficult airway. Awake intubation is the gold standard for managing a difficult airway.[1] However, the disarranged anatomy and associated hemorrhage in trauma cases sometimes require intubating the patient in a nonsupine position. This is the first case report to demonstrate successful awake intubation of a patient with maxillofacial trauma utilizing a video laryngoscope in the resuscitation room.

Care Report

A 37-year-old male (approximately 170 cm, 75 kg) was referred from a district hospital 8 h after crashing his vehicle. High-speed impact with the windshield caused severe trauma to his midface. Before arrival at our level I trauma center, he never lost consciousness nor showed neurological deficits and had no period of circulatory shock.

On physical examination, the patient was alert, sitting upright while slightly leaning forward to avoid aspirating blood oozing from his facial wounds. He suffered full-thickness lacerations on his nose and both cheeks; his nose and the medial portion upper jaw were almost completely torn off. Suctioning blood from the trauma-induced cavity revealed a partially shredded tongue

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and buccal mucosa. Deformity on his left mandible indicated a closed fracture. The patient's initial vital signs were respiratory rate of 22–24 times/min with equal breath sounds from both lungs, peripheral oxygen saturation of 97%–99% with supplemental oxygen 10 L/min, and heart rate 149 bpm with blood pressure 92 / 53 mmHg. Glasgow Coma Scale score was 15 with no signs of lateralization; he could follow instructions and coherently answer questions using hand gestures. No visible wounds were seen on his trunk or extremities. We performed an abbreviated secondary survey with extreme care taken to prevent disturbances to his airway. An upright chest X-ray showed infiltrates in the right lower segment, while the FAST examination was normal.

Intubation in the resuscitation room was decided due to two reasons: first, bleeding from the midface presented a continuous threat to maintaining airway patency. The placement of the cervical collar placed his neck in the anatomical resting position, but he began aspirating blood. Second, the patient began showing signs of impending circulatory compromise even after hydration with 2 Ls crystalloids and 1 L colloid. Our primary airway plan was awake orotracheal tube intubation in the resuscitation room with secondary controlled tracheostomy in the operating room; the contingency plan was orotracheal intubation under anesthesia in the resuscitation room if awake intubation failed at the first attempt. We initially discussed the possibility of an awake tracheostomy with local anesthesia to avoid manipulating the injured midface area. However, the patient's preferred forward-leaning sitting position made it difficult to perform awake tracheostomy as safely and swiftly as possible.

We opted for awake intubation in a sitting, face-to-face position with the anesthesiologist using a GlideScope® video laryngoscope (Verathon, Washington, USA) that was readily available. Preoxygenation was achieved with the patient spontaneously breathing blow-by oxygen delivered with a Jackson Rees circuit [Video 1]. Lidocaine 10% solution was sprayed as a topical anesthetic to the oropharynx and trachea. Continuous suction was applied the entire procedure. After clear visualization of the epiglottis and vocal cords, a size 8.0 endotracheal tube (bent halfway into a J-shape using a regular stylet) was successfully inserted on the first attempt. After cuff inflation, appropriate placement was confirmed with equal bilateral rise and fall of the chest and equal breath sounds. The tube was secured by tying a roll gauze encircling his head [Figure 1]. Postintubation, respiratory rate was 24–26 times/min with SpO_2 99%, heart rate 133 bpm with blood pressure 90 / 53 mmHg. The patient was subsequently sedated with ketamine pump but not given paralytics to maintain spontaneous respiration.

After confirming no abnormalities in the lateral cervical X-ray, the patient was transported to the emergency operating room. The surgical team performed a tracheostomy as a definitive airway to achieve better access for debridement and approximation of the degloving facial wounds [Figure 2]. After surgery, a computed tomography three-dimensional reconstruction scan established a diagnosis of comminuted nasal, zygomatic, and maxillary fractures, with complete fracture and superoposterior displacement of the left body of the mandible. The brain scan was normal. Sadly, after an initial period of clinical improvement, the patient developed respiratory distress with a steep decline in consciousness; he died 4 days after the initial surgery. Written informed consent was obtained from the patient's next of kin for publication purposes.

Discussion

Maxillofacial trauma in the emergency department presents a multifaceted challenge. Facial injury is usually not life-

Figure 1: Securing tube placement with roll gauze

Figure 2: Secondary surgical tracheostomy followed by surgical approximation of facial degloving wounds

threatening, but compromised airway integrity may cause inadequate oxygenation, the common cause of early death in trauma patients.[2] Emergency intubation of maxillofacial trauma patients has a remarkably high risk of complications arising from the technical difficulty of a disrupted airway, time constraints due to possible rapid deterioration of the patient's condition,[3] and additional considerations caused by concomitant trauma to the head and cervical spine.[4,5] Therefore, managing a traumatized airway requires knowledge and technical mastery of wide-ranging techniques, guided by a reproducible approach with sound clinical judgment for application tailored to different scenarios.[6] The 2022 American Society of Anesthesiologists guideline provides algorithm recommendations for managing an anticipated difficult airway.[1]

In this case, it was evident during the primary survey that the patient had a high risk for aspiration and would need to be transported to the radiology department and emergency operating room. Both reasons supported the decision to perform intubation to secure his airway.

Supplemental oxygen was given over the face/blow-by, as a face mask would risk displacing tissue and facial bone fragments further inside the patient's airway.[7] Lidocaine 10% clear solution was sprayed on the mucosal surface of the posterior tongue, oropharynx, and trachea to minimize gag reflex and tracheal airway reflexes. After approximately 2 min, anesthesia was achieved to allow laryngoscopy and intubation.

With the severity of the patient's facial injuries, we opted not to administer intravenous sedatives or opioids to keep him fully awake and avoid central respiratory depression. Awake intubation in a difficult airway provides several advantages: (a) Maintains the patient's protective airway reflexes to reduce the risk of pulmonary aspiration, (b) maintains spontaneous ventilation, (c) sustains airway patency by maintaining the tone of upper pharyngeal muscles, and (d) prevents displacement of the larynx to a more anterior position after induction of anesthesia to provide better easier visualization of vocal cords and trachea.[8]

The use of video-assisted laryngoscopy (VAL) or flexible scope has improved success rates of first-pass intubation attempts in patients with difficult airways and reduce complications such as desaturation, esophageal intubation, or overextension of the cervical spine.[1] In our case, VAL was chosen because maneuvering the fiberoptic scope would be more complex and time-consuming due to lens contamination from blood and secretion and its inability to displace debris.

Intubating in the sitting position is beneficial as it decreases the risk of desaturation from pulmonary aspiration and enhances oxygenation by optimizing the lungs' functional residual capacity and tidal volume.[9] Glottic visualization is easier in the sitting position due to the tendency of the tongue to fall into the inferior oral cavity, not posteriorly to the oropharynx. Comparison studies on airway mannequins[10] and cadavers[11] positioned upright have shown statistically insignificant differences in first-pass success and intubation time. In the present case, the advantages of having the patient sitting upright are more pronounced, as his shredded tongue would have been more difficult to displace with the laryngoscope blade.

The intubating anesthesiologist in this case positioned himself face to face with the patient for direct visualization of the airway while viewing the GlideScope® monitor placed slightly to his left. Previous case reports have shown successful face-to-face intubation using lightwands[12] and other VAL modalities.[13] Others have reported success intubating using VAL on a sitting patient with the operator standing behind and slightly above the patient.[14] Operator preference is based on familiarity with handling whichever intubating device is available.

The total time of laryngoscopy-to-intubation time in this patient was approximately 5 min. No complications from the emergency intubation were observed during transport, surgery, and postoperative period.

Conclusion

Patients with severe maxillofacial trauma who maintain full consciousness may be unable to lie supine. It would be better to have the patient sit upright with the intubating operator positioned in front of the patient to reduce the risk of aspiration and other emergency intubation complications. With an experienced operator, face-to-face upright awake intubation using VAL can be performed safely for cooperative patients with severe maxillofacial trauma.

Author contribution statement

LVA: data curation (lead); writing of original draft (lead); visualization (equal); review and editing (equal). AM: conceptualization (lead); visualization (equal); review and editing (equal). PSA: supervision (lead); review and editing (supporting). All authors have read and approved the content of the final manuscript.

Conflicts of interest

None declared.

Consent to participate

Consent to participate is given by the next of kin of the patient reported in this article (see attached file).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his

images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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References

1. Apfelbaum JL, Hagberg CA, Connis RT, Abdelmalak BB, Agarkar M, Dutton RP, *et al*. 2022 American Society of Anesthesiologists practice guidelines for management of the difficult airway. Anesthesiology 2022;136:31-81.
2. Moscardi MF, Jacobucci RP, Onugha HU, Marttos A. Initial trauma care. In: Nasr A, Tomasich F, Collaco I, Abreu P, Namias N, Marttos A, editors. The Trauma Golden Hour a Practical Guide. Baltimore: Springer; 2020.
3. 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.
4. Salentijn EG, Peerdeman SM, Boffano P, van den Bergh B, Forouzanfar T. A ten-year analysis of the traumatic maxillofacial and brain injury patient in Amsterdam: Incidence and aetiology. J Craniomaxillofac Surg 2014;42:705-10.
5. Canzi G, De Ponti E, Filippi A, Bozzetti A, Sozzi D, Novelli G. The burden of facial trauma on mortality in patients with multiple injuries: A single-center analysis of 1862 motorcycle accidents. J Craniomaxillofac Surg 2022;50:146-9.
6. Gibbs MA, Raja AS, Gonzalez MG. The trauma patient. In: Brown CA, Sakles JC, Mick NW, editors. The Walls Manual of Emergency Airway Management. Philadelphia: Wolters Kluwer; 2018.
7. Jain U, McCunn M, Smith CE, Pittet JF. Management of the traumatized airway. Anesthesiology 2016;124:199-206.
8. Artime CA, Sanchez A. Preparation of the patient for awake intubation. In: Hagberg CA, Artime CA, Aziz MF, editors. Hagberg and Benumof's Airway Management. 4th ed. Philadelphia: Elsevier, Inc.; 2018.
9. Venezia D, Wackett A, Remedios A, Tarsia V. Comparison of sitting face-to-face intubation (two-person technique) with standard oral-tracheal intubation in novices: A mannequin study. J Emerg Med 2012;43:1188-95.
10. Julliard D, Vassiliadis J, Bowra J, Gillett M, Knipp R, Krishnamohan A, *et al*. Comparison of supine and upright face-to-face cadaver intubation. Am J Emerg Med 2022;56:87-91.
11. Jeong H, Chae M, Seo H, Yi JW, Kang JM, Lee BJ. Face-to-face intubation using a lightwand in a patient with severe thoracolumbar kyphosis: A case report. BMC Anesthesiol 2018;18:92.
12. Ynineb Y, Boglietto E, Bonnet F, Quesnel C, Garnier M. Face-to-face double-lumen tube intubation with the airtraq video laryngoscope for emergency thoracic surgery: A case report. Semin Cardiothorac Vasc Anesth 2022;26:90-4.
13. Kinoshita H, Sato N, Mimura S, Kato S, Takada T, Nakajima Y. Anesthetic induction and endotracheal intubation in the sitting position due to the fixed forearm caught by a meat grinder. Braz J Anesthesiol 2023;73:227-9.
14. Fontanarosa PB, Goldman GE, Polsky SS, Schuckman HA, Poyle M. Sitting Oral-Tracheal Intubation. Ann Emerg Med 1988;17:336-8.