PIONEER
MEDICAL JOURNAL

Vol.5 No.2 Jul. - Dec., 2025

ERRATUM:
This article was inadvertently republished under Volume 5, No. 2 (July–December 2025)
following a redesign and restructuring of the journal website.
The correct bibliographic designation for this article is Volume 14, No. 2 (January–June 2026),
under which it was originally published.
This correction affects only the volume, issue, and publication-period metadata.
The article content, DOI, authorship, pagination, and publication date remain unchanged.

www.pioneermedicaljournal.com
ISSN: 2354 - 1954

Official Publication of The Medical and Dental Consultants' Association of Nigeria ***(MDCAN)***
FMC, Umuahia Chapter.

Editor In-Chief
DR. CHIMEZIE GODSWILL OKWUONU

PIONEER MEDICAL

JOURNAL

OFFICIAL SCIENTIFIC

PUBLICATION OF MEDICAL AND DENTAL CONSULTANTS

ASSOCIATION OF NIGERIA

(MDCAN)

FEDERAL MEDICAL CENTRE UMUAHIA

ABIA STATE

NIGERIA

CASE REPORT

Airway management in a patient with gunshot injury to the face: A case report.

Ilo IS[1], Ilo DI[1], Iwegbu I [2]

1 Department of Anaesthesia, Federal Medical Centre Umuahia, Abia State, Nigeria.

2 Department of Oral and Maxillofacial surgery, Federal Medical Centre Umuahia, Abia State.

Corresponding Author: Ilo Doris Ifeyinwa

Department of Anaesthesia, Federal Medical Centre Umuahia, Abia State.

Phone number: 08038740853

Email: ilodoris5@gmail.com

ABSTRACT

Background

Difficult Airway management may be encountered when managing a patient with a gunshot injury to the face. Injuries to the maxillofacial region present one of the most challenging problem for the anaesthetist. Maxillofacial trauma is commonly caused by road traffic accident, firearms, assaults etc.

Case presentation: We present a case of difficult airway management in a 31yr old male billed for re-exploration, mandibular plating and reconstruction on account of wound breakdown and unstable mandible. The patient had a close-range gunshot injury to the face 2 months prior to the procedure. Airway examination revealed poor mouth opening, Mallampati 4, upper lip bite test 3, defect at the left side of the mandible with exposure of the plate. The patient was adjudged difficult airway and difficult airway adjuncts were made available. He was premedicated with glycopyrrolate, pethidine, plaster was used to cover the defect to achieve good mask ventilation. Induction was with fast offset agent propofol, test ventilation was done successfully, intubation was facilitated with fast offset agent suxamethonium. Initial airway plan was intubating LMA. First attempt with intubating LMA failed. However, improvement in mouth opening was noted at this point hence reverting using Macintosh size 4 blade, laryngoscopic view of Cormack and Lehane grade III was seen,

gum elastic bougie was inserted, a 7.5mm cuffed endotracheal tube was railroaded into the tracheal and correct placement confirmed. The procedure continued uneventfully, and patient was extubated awake at the end of the case.

Conclusion: Late airway management in maxillofacial trauma usually poses challenge to the anaesthetist, proper evaluation, planning and experienced intervention will improve outcome.

Key words: Maxillofacial, gunshot, difficult airway.

INTRODUCTION

Airway control in patients with maxillofacial trauma remains a critical and often challenging component of anaesthetic practice. Gunshot injuries to the face are associated with extensive soft tissue disruption, comminuted fractures, distortion of normal anatomy, restricted mouth opening, and progressive fibrosis during healing.[1] These factors increase the likelihood of difficult mask ventilation and tracheal intubation. The incidence of difficult airway in patients with facial trauma is higher than in the general surgical population, particularly in the presence of mandibular fractures and soft tissue swelling.[2,3]

In the acute phase, airway compromise commonly results from haemorrhage, oedema, foreign bodies, and altered consciousness. [4] However, delayed presentation introduces additional challenges, scar contracture, malunion or non-union of fractures, limited temporomandibular joint mobility, and distorted anatomical landmarks may complicate conventional laryngoscopy. Post-traumatic fibrosis and reconstructive procedures further increase the risk of anticipated difficult intubation.[5]

Firearm injuries continue to be a major public health problem. [6] Injuries to the maxillofacial region leads to varying degrees of airway compromise and poses a challenge to the anaesthesiologists.[7]

Difficult Airway may be encountered when managing a patient with a gunshot injury to the face especially when there is associated stiffness of the temporomandibular joint due to late management. [8] The implication will be reduction of mouth opening that make the intubation procedures difficult and predisposing the patient to increased risk of failed intubation.[9,10]

In resource-limited settings where advanced adjuncts such as fiberoptic bronchoscopes are unavailable, decision-making becomes heavily reliant on clinical assessment and basic airway equipment. [11]

This case report describes the anaesthetic management of a patient presenting two months after a gunshot injury to the face for re-exploration, highlighting the implications of delayed airway distortion and the considerations that informed the chosen airway approach. It aims to contribute to existing literature on post-traumatic airway management and to underscore the importance of meticulous

planning and preparedness in complex airway scenarios.

CASE PRESENTATION

A 31yr old male billed for re-exploration, mandibular plating and reconstruction on account of wound breakdown and unstable mandible. The patient had a close range gunshot injury to the face 2 months prior to the procedure. There was a history of surgery 3 days after the injury under General anaesthesia with tracheostomy with no adverse anaesthetic reaction.

Weeks later the mandibular plate was noted to be displaced with wound breakdown, with a complaint of drooling of saliva.

Examination revealed a conscious and alert young man, in no obvious distress, afebrile, anicteric, acyanosed, not dehydrated with skin defect on the left side of the face, exposing the plate, with maxilla-mandibular fixation, and drooling of saliva and loss of some dentition.

Other systemic examination was essentially normal.

Airway examination revealed severe restriction in mouth opening despite release of maxilla-mandibular fixation.

The patient was given IV pethidine 50mg in aliquot twice , iv paracetamol 900mg, and the mouth opening re-evaluated again after 15mins which was estimated to be 2.5cm, upper lip bite test was 3 with Mallampati IV.

The patient was adjudged difficult airway and difficult airway adjuncts were made available including, gum elastic bougie, maccoy laryngoscope, mackintosh laryngoscope and intubating LMA. Airway cart was also made available including cricothyotomy pack. Fibreoptic bronchoscope and Videolaryngoscope was not available in this poor resource setting. Drug with safe offset propofol and suxamethonium was used.

Airway plan was to use intubating LMA due to poor mouth opening, but if mouth opening improves following muscle relaxant administration, Mackintosh laryngoscope will be deployed. He was premedicated with iv glycopyrrolate 0.2mg, plaster was used to cover the defect in the left side of the cheek to achieve good mask ventilation.

The patient was preoxygenated with 100% oxygen for 5mins, induction was with propofol 100mg, intubation was facilitated with suxamethonium 100mg, intubating LMA was inserted, endotracheal tube passed, serial auscultation revealed no air entry. Tube was removed and mask ventilation commenced immediately, additional IV propofol 50mg , atropine 1mg, and suxamethonium 50mg was given, mouth opening was noted to have

improved markedly, hence reverting to intubation using blade size 4 Macintosh laryngoscope with laryngoscopic view of Cormack and Lehane grade III.

Gum elastic bougie was inserted, a size 7.5mm cuffed endotracheal tube was railroaded into the tracheal and correct placement confirmed. The procedure continued uneventfully, and patient was extubated awake at the end of the case after reversal of neuromuscular blockade.

DISCUSSION

The priority in the management of patients with facial gunshot wounds is airway maintenance with cervical spine control and later definitive repair of the facial deformity.

Management of the airway is a major concern in patients with maxillofacial trauma because a compromised airway can lead to death.[12]

There are four main steps in the management of patients with gunshot wounds to the face; securing an airway, controlling hemorrhage, identifying other injuries, and definitive repair of the traumatic facial deformities.[13],[14]

Early management of patients with gunshot wounds should focus on resuscitation with paramount attention given to the airway. Bleeding from the airway and the subsequent swelling can significantly compromise the airway.[15]

Control of the airway with either an endotracheal tube or tracheostomy should be considered early. Airway management in these patients can be difficult.

An urgent airway is required in up to 35% of patients;[16] in 83% of patients, oral endotracheal intubation is initially successful;[17] while a surgical airway is required in the remaining 17% of patients ; due to tracheal occlusion from oedema, loss of bony integrity or active hemorrhage.

The method of intubation to use in these patients remains a controversial topic especially in a patient with late management of the TMJ injury due to associated fibrosis formation and limited mouth opening.

Flexible fiber optic bronchoscope is recommended in a patient with small mouth openings of less than 2cm.[4]

As an alternative to endotracheal intubation the use of a laryngeal mask airways can be considered, which provides airway protections with less airway trauma.[18] Ilo DI, in study of paediatric age group demonstrated excellent ease of LMA insertion with the use of propofol.[19] This pharmacological profile was seen in the index patient, were propofol and suxamethoinum were metabolized fast requiring second dose of the agents.

The index patient demonstrated multiple predictors of difficult airway: Mouth opening of 2.5 cm, Upper lip bite test grade III, Mallampati class IV and Facial defect with exposed hardware.

Limited inter-incisor distance (<3 cm) is strongly associated with difficult laryngoscopy and intubation. [20] In cases where mouth opening is <2 cm, awake flexible fibreoptic intubation is generally recommended as the technique of choice.[21] However, availability constraints may necessitate alternative strategies; the use of intubating LMA (ILMA) as first airway plan as encountered in this setting.

The ILMA was selected as the primary plan due to restricted mouth opening and anticipated difficulty with direct laryngoscopy. Supraglottic airway devices are recognized as rescue or conduit devices in difficult airway algorithms and may facilitate blind or fibreoptic-guided intubation.[20,22]

However, ILMA placement may be limited in patients with severe orofacial distortion. In this case, failed intubation through the ILMA necessitated immediate reversion to mask ventilation, consistent with recommended "failed intubation" management pathways.[20,22]

Following additional administration of suxamethonium (which has fast offset in case of difficulty) and opioid, mouth opening improved significantly. Trismus in maxillofacial trauma may be partly due to reflex muscle spasm or pain-induced restriction. Adequate neuromuscular blockade has been shown to improve laryngoscopic conditions in selected patients without fixed fibrotic ankylosis.[22]

Better mouth opening seen in our patient following failed LMA insertion could be as a result of maximum muscle relaxation of the IV suxamethonium given at the initial time. Their demonstrable improved mouth opening following neuromuscular blockade in patients with restricted jaw mobility[23]

It could also be as a result of insertion of the LMA which affected the movement at the temporomandibular joint.

Direct laryngoscopy after initial failed attempt revealed a Cormack–Lehane grade III view. The gum elastic bougie is recommended as a first-line adjunct in grade IIb–III views and has been shown to significantly improve first-pass success rates in difficult laryngoscopy.[24]

Intubation using Gum elastic bougie remains an essential low-cost adjunct, particularly in resource-constrained environments where videolaryngoscopy or fibreoptic bronchoscopy may not be readily available. Current difficult airway guidelines emphasize the importance of

having such adjuncts immediately available.[20]

Successful railroading of the endotracheal tube over the bougie secured definitive airway control and allowed the surgery to proceed uneventfully in our patient.

Several alternative strategies could be considered in similar scenarios: Awake fibreoptic intubation (gold standard for severe restriction)[21], Videolaryngoscopy, which improves glottic visualization in grade III views ,[2] Elective tracheostomy, particularly in cases with anticipated postoperative airway compromise.[1]

In this patient, prior tracheostomy history suggests that a surgical airway remained a viable backup option if non-surgical approaches failed.

Extubation in patients with difficult airway should be carefully planned. Awake extubation with full reversal of neuromuscular blockade was appropriate in our patient, given the absence of intraoperative airway edema or bleeding. Difficult airway extubation guidelines recommend readiness for re-intubation and availability of airway exchange devices where feasible.[22]

CONCLUSION

Airway management in patients with gunshot injuries to the face with delayed presentation requires an individualized approach plan.

In resource poor setting, utilization of Anaesthetist who is proficient in advance airway management, airway evaluation, use of available airway devices, will improve success in achieving a definitive airway.

Conflict of Interest Statement: The authors declare no conflicts of interest.

Funding Statement: No specific funding was received for this work.

Patient Consent: Written informed consent was obtained from the patient for the publication of this case report. The patient understood that all identifying information would be removed to ensure confidentiality. Ethical approval was not required for this case report as per institutional guidelines.

Fig. 1: The Index patient with facial injuries.

REFERENCES

1 Breeze J, Gibbons AJ. Contemporary management of maxillofacial ballistic trauma. Br J Oral Maxillofac Surg. 2020;58(6):673–680.

2 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. Anesthesiology. 2022;136(1):31–81

3 Adeyemo WL, Bamgbose BO, Ogunlewe MO, Ladeinde AL, Taiwo OA. Airway management in maxillofacial trauma: a review of challenges and outcomes in a Nigerian tertiary hospital. Niger J Clin Pract. 2020;23(5):607–612.

4 Thanni LO, Osinupebi OA, Deji-Agboola AM. Airway management challenges in maxillofacial trauma in a Nigerian tertiary hospital. Niger J Clin Pract. 2020;23(5):670–675

5 ATLS Subcommittee; American College of Surgeons' Committee on Trauma; International ATLS working group. Advanced trauma life support (ATLS®): the ninth edition. J Trauma Acute Care Surg. 2013;74(5):1363–6.

6 The Lancet Global Health. Global mortality from firearms, 1990–2016. Lancet Glob Health. 2018;6(7):e721–e722.

7 Faponle AF, Soyannwo OA, Amanor-Boadu SD. Airway management in patients with maxillofacial trauma in a Nigerian hospital. Afr J Anaesth Intensive Care. 2020;20(1):9–15.

8 Adeyemo WL, Ladeinde AL, Ogunlewe MO, James O. Airway management challenges in maxillofacial trauma in a Nigerian tertiary hospital. Niger J Clin Pract. 2020;23(5):647–652.

9 Okafor UV, Nwokediuko SC. Maxillofacial trauma and airway management difficulties in Nigerian patients. Afr Health Sci. 2016;16(3):751–757.

10 Olumide A, Adeola O, Akinola O. Airway management challenges in Nigerian patients with limited mouth opening. Niger J Clin Pract. 2018;21(6):755–760.

11 Olatunji G, Kokori E, Aderinto N, Alsabri HM. Emergency airway management in resource limited setting. Int J Emerg Med. 2024;17:41.

12 Osinaike BB, Gbolahan OO, Olusanya AA. Intra-operative airway management in patients with maxillofacial trauma having reduction and immobilization of facial fractures. Niger J Surg. 2015;21(1):26–30

13 Akinbami BO, Osunde OD, Okoje VN. Management of maxillofacial gunshot injuries in a Nigerian tertiary hospital: a review of treatment principles and outcomes. Niger J Surg. 2019;25(2):120–125.

14 Breeze J, Gibbons AJ, Hunt NC, Shieff C. Contemporary management of maxillofacial ballistic trauma. Br J Oral Maxillofac Surg. 2020;58(9):1015–1021

15 Nwawolo CC, Asoegwu CN. Experience with managing penetrating anterior neck injuries in Lagos, Nigeria. Journal of the West African College of Surgeons. 2017;7(3):1–10

16 Schade K, Borzotta A, Micheal A. Intracranial malposition of nasopharyngeal airway . J.Trauma. 2000; 49:967-968.

17 Demetriades D, Chahwan S, Gomez H et al. Initial evaluation and management of gunshot wounds to the face. J. Trauma 1998; 45;39-41.

18 Gaszynski T. Airway management in a patient for general anaesthesia in patient with rheumatic disease ; new possibilities. Reumatologia. 2019;57(2):69-71.

19 Ilo DI, Erondu MA, Ilo IS, Desalu I. A Study of ease of Laryngeal Mask Airway insertion and Haemodynamic effects following co-induction with midazolam and propofol versus propofol alone in children.AJOI: 2020. 20(1).

20 Frerk C, Mitchell VS, McNarry AF, Mendonca C, Bhagrath R, Patel A, et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. Br J Anaesth. 2015;115(6):827–848.

21Ahmad I, El-Boghdadly K, Bhagrath R, Hodzovic I, McNarry AF, Mir F, et al. Difficult Airway Society guidelines for awake tracheal intubation in adults. Anaesthesia. 2020;75(4):509–528.

22 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(1):31–81.

23 Smith JE, Patel A. Airway management in patients with limited mouth opening. Anaesthesia. 2018;73(3):331–340

24 Driver BE, Prekker ME, Klein LR, Reardon RF, Miner JR. Effect of use of a bougie vs endotracheal tube with stylet on first-attempt intubation success among patients with difficult airways undergoing emergency intubation. JAMA. 2018;319(21):2179–2189.