

Visual Case Discussion

Exposed mandible following motorcycle trauma: emergency stabilization of an open mandibular fracture with a floating segment

Fatin Aisya Ahmad Shukri^{a,b,*} , Nur Adibah Mat Zubir^a, Soh Chen Loong^a,
Ahmad Hafizuddin Johari^b

^a Department Oral and Maxillofacial Surgery Hospital Tengku Ampuan Afzan, Jalan Tanah Putih, 25100, Kuantan, Pahang, Malaysia

^b Department Otorhinolaryngology, Kulliyah of Medicine International Islamic University Malaysia (IIUM), Jalan Sultan Haji Ahmad Shah, Bandar Indera Mahkota, 25200, Kuantan, Pahang, Malaysia

ARTICLE INFO

Keywords:

Mandibular fracture
Emergency stabilization
Floating segment

1. Discussion

Mandibular fractures are among the most common injuries in maxillofacial trauma, with road traffic accidents remaining a leading cause, particularly among motorcyclists not wearing helmets. Owing to its anatomical prominence and biomechanical properties, the mandible is highly susceptible to high-impact forces, often resulting in displaced or unstable fracture patterns¹.

In this case, visible intraoral bone exposure confirmed a compound open fracture. This has important clinical implications, as communication with the oral cavity exposes the fracture site to a heavily colonized environment, increasing the risk of infection, osteomyelitis, and non-union if not promptly managed².

Management in the emergency setting follows standard trauma principles, with airway assessment and protection as the immediate priority. These injuries can threaten the airway due to bleeding, soft tissue edema, and posterior displacement of fracture fragments. Early recognition, with readiness for suctioning, airway adjuncts, or definitive airway intervention, is essential. Haemorrhage control, adequate analgesia, and cervical spine immobilization should be instituted concurrently.

A focused intraoral examination is critical but often overlooked. Malocclusion, mucosal disruption, dental injury, and exposed bone are key indicators, particularly in open fractures that may not be obvious externally. Early administration of broad-spectrum antibiotics and tetanus prophylaxis is recommended to reduce infectious complications³.

In this patient, malocclusion with a mobile floating mandibular segment indicated an unstable fracture requiring urgent stabilization. While definitive fixation is usually performed in the operating theatre, this case demonstrates the value of early bedside stabilization in the emergency department. Interdental wiring and arch bar placement provided immediate immobilization, maintained occlusion, reduced pain, and limited further soft tissue injury. These temporizing measures are especially useful when definitive surgery is delayed.

Definitive management is most commonly achieved with open reduction and internal fixation, restoring anatomical alignment and enabling early functional recovery. In selected cases, a short delay may be appropriate to allow soft tissue swelling to subside.

This case demonstrates the need for early recognition, structured emergency management, and timely interim stabilization to minimize complications and optimize outcomes in maxillofacial trauma.

2. Visual case discussion

A 40-year-old male was brought to the emergency department following a motorcycle accident. He was not wearing a helmet and was struck from behind, throwing him forward on impact. The patient reported retrograde amnesia but was alert on arrival, with a Glasgow Coma Scale (GCS) score of 15/15.

Primary survey showed a patent airway with no respiratory compromise or haemodynamic instability. The cervical spine was immobilized with a rigid collar in accordance with trauma protocol.

* Corresponding author.

E-mail address: fasyashukri92@gmail.com (F.A.A. Shukri).

<https://doi.org/10.1016/j.visj.2026.102570>

Received 13 May 2026; Received in revised form 15 June 2026; Accepted 26 June 2026

Available online 7 July 2026

2405-4690/© 2026 Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.



Fig. 1. External maxillofacial injuries following motorcycle trauma, demonstrating multiple facial soft tissue injuries, including a jagged laceration over the mandibular region*, a through-and-through laceration of the lower lip**, and a jagged wound over the left nasolabial region***. There is facial asymmetry with deviation of the mandible toward the right, suggestive of an underlying mandibular fracture.

Secondary survey revealed significant maxillofacial injuries, including multiple facial abrasions and lacerations, a jagged mandibular wound, a through-and-through lower lip laceration, and a left nasolabial laceration. Facial asymmetry with deviation of the mandible to the right was noted (Fig. 1).

Computed tomography (CT) was performed in the emergency setting. CT brain showed no intracranial haemorrhage, and CT cervical spine revealed no fracture. The patient remained immobilized pending formal clearance. CT facial bone reconstruction demonstrated a displaced right parasymphysis mandibular fracture with disruption of mandibular continuity (Fig. 2).

The oral and maxillofacial surgery team was consulted. Intraoral examination revealed active bleeding, mucosal disruption over the alveolar ridge and buccal mucosa, and exposed mandibular bone with multiple displaced teeth. A mobile floating mandibular segment was



Fig. 3. Intraoral findings demonstrating open mandibular fracture with floating segment.

Intraoral photograph showing extensive mucosal disruption with a jagged wound over the alveolar ridge and buccal mucosa, associated with exposed mandibular bone and multiple displaced teeth. A mobile (floating) mandibular segment is evident, consistent with an unstable compound mandibular fracture.

identified, consistent with a compound fracture (Fig. 3). Tooth preservation was attempted while maintaining strict cervical spine precautions.

Initial management included haemorrhage control, analgesia, and stabilization. Given the instability, bedside interdental wiring and arch bar placement were performed to restore occlusion and immobilize the fracture segment (Fig. 4).

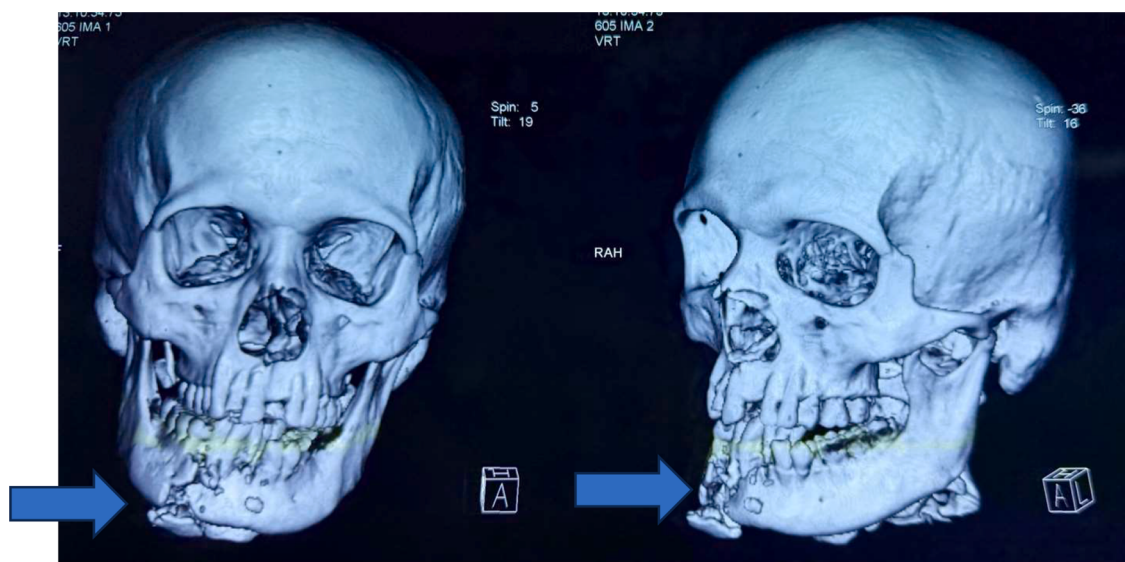


Fig. 2. Three-dimensional computed tomography reconstruction demonstrating mandibular fracture.

Three-dimensional CT reconstruction of the facial bones showing a right parasymphysis mandibular fracture with disruption of the mandibular continuity. The fracture is associated with displacement of the fracture segments and malalignment of the dental arch, correlating with the clinical findings of malocclusion and a mobile mandibular segment.



Fig. 4. Bedside stabilization with interdental wiring and arch bar fixation.

Post-procedural intraoral photograph demonstrating placement of arch bars over the maxillary and mandibular dental arches with interdental wiring, achieving stabilization of the fracture segment. This allowed preservation of the involved teeth and restoration of occlusal alignment prior to definitive surgical management.

Definitive management was performed two weeks later with open reduction and internal fixation (ORIF). The patient recovered well and was arranged for outpatient follow-up.

3. Questions and answers

1. What is the most important initial priority in the emergency management of a patient with suspected mandibular fracture and intraoral bleeding?

- A. Immediate CT scan of the facial bones
- B. Administration of intravenous antibiotics
- C. Airway assessment and protection
- D. Definitive surgical fixation
- E. Dental occlusion assessment

Answer: C. Airway assessment and protection

Explanation:

Airway management is the primary priority in trauma care. Mandibular fractures can compromise the airway due to bleeding, edema, or displacement of fracture fragments. Other interventions should follow once the airway is secured.

2. Which of the following findings is most indicative of an open mandibular fracture?

- A. Facial swelling
- B. Malocclusion
- C. Trismus
- D. Intraoral bone exposure
- E. Jaw pain

Answer: D. Intraoral bone exposure

Explanation:

Open mandibular fractures are defined by communication between the fracture site and the external environment. Intraoral bone exposure is a definitive clinical sign and requires prompt antibiotic therapy and surgical management to prevent complications.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying clinical images. All reasonable efforts were made to maintain patient confidentiality and anonymity.

CRediT authorship contribution statement

Fatin Aisya Ahmad Shukri: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Nur Adibah Mat Zubir:** Resources, Writing – original draft. **Soh Chen Loong:** Writing – review & editing, Validation, Supervision. **Ahmad Hafizuddin Johari:** Validation, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: I declare no financial support, not involve in the editorial review or decision to publish this article. This article has no conflict of interest

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.visj.2026.102570](https://doi.org/10.1016/j.visj.2026.102570).

References

- Boffano P, Rocca F, Zavattero E, et al. European Maxillofacial Trauma (EURMAT) project: a multicentre and prospective study. *J Cranio-Maxillofac Surg.* 2015;43(1): 62–70.
- Ellis III E, Moos KF, El-Attar A. Ten years of mandibular fractures: an analysis of 2,137 cases. *Oral Surg Oral Med Oral Pathol.* 1985;59(2):120–129.
- Galvagno SM, Nahmias JT, Young DA. Advanced trauma life support® update 2019: management and applications for adults and special populations. *Anesthesiol Clin.* 2019;37(1):13–32.