

Comminuted Mandibular Fracture Following A Road Traffic Accident: A Clinical Case Report

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ABSTRACT

Background: The mandible is one of the most commonly fractured facial bones and is frequently encountered in emergency and maxillofacial trauma settings. Motor vehicle accidents and interpersonal violence remain the leading causes, and fracture patterns range from isolated, low-velocity injuries to comminuted or avulsive injuries associated with multisystem trauma.

Case Presentation: We report the case of a 45-year-old female who sustained a comminuted fracture of the mandible along with multiple facial lacerations and dento-alveolar injury following a road traffic accident. She presented with deranged dental occlusion, trismus, and avulsion of teeth 21, 31, 32, 41, and 42. She was managed with open reduction and internal fixation under naso-endotracheal intubation, combined with wound debridement and primary closure of facial lacerations, performed over a three-hour procedure under general anesthesia.

Conclusion: The patient recovered well with supportive medical management and was discharged in a stable condition. This case highlights the importance of a systematic, multidisciplinary approach to comminuted mandibular fractures, combining anatomic reduction, restoration of occlusion, and infection prevention to optimize functional and esthetic outcomes.

Keywords: Mandible Fracture, Road Traffic Accident, Comminuted Fracture, Open Reduction and Internal Fixation, Maxillofacial Trauma, Dento-alveolar Injury, Case Report

INTRODUCTION

The mandible is one of the most commonly fractured facial bones and is frequently seen in the emergency department. Facial fractures are most often caused by trauma, including contact sports, falls, industrial accidents, motor vehicle collisions, and physical altercations. Because of the force typically involved, it is essential to evaluate patients with mandibular fractures for concomitant injuries, particularly cervical spine and traumatic brain injuries.

The management of mandible fractures is a central component of facial trauma care that the oral and maxillofacial surgeon must be adept at handling. Retrospective studies indicate that mandibular fractures are the most common fracture pattern encountered in maxillofacial trauma, ranging in complexity from isolated injuries resulting from low-velocity trauma to comminuted or avulsive injuries associated with multisystem involvement. Motor vehicle accidents and interpersonal violence are the most frequently cited causes. Variability in fracture pattern and severity produces a correspondingly wide range of functional impairment and potential complications.

The goals of treatment for mandibular fractures are to achieve:

- Early return to function
- Anatomic reduction and stabilization of the fracture
- Establishment and preservation of occlusion
- Avoidance of infection
- Avoidance of malunion or nonunion

We present a case of comminuted mandibular fracture with associated dento-alveolar and soft-tissue trauma following a road traffic accident, along with its surgical management and clinical course.

CASE REPORT

A 45-year-old female sustained injuries in a road traffic accident and was admitted to Suyog Hospital, Mysore, following the incident. After initial stabilization, a detailed history was obtained, including the mechanism of injury, and a complete head and neck examination was performed.

On examination, the patient presented with severe facial injury involving the forehead and lower lip, deep lacerated wounds over the lower lip, forehead, and cheek, deranged dental occlusion, and inability to open the mouth (trismus). Clinical findings were consistent with a fracture of the mandible extending from the symphysis to the retromolar trigone, with an associated dento-alveolar fracture, mobile teeth in the maxillary region, and avulsion of teeth 21, 31, 32, 41, and 42.

Following relevant diagnostic imaging, the patient was diagnosed with a comminuted fracture of the mandible involving the left symphysis, parasymphysis, and body, along with multiple facial lacerations. Deep lacerated wounds were also noted over the left forehead, left nasal bone/arch, and the left lower lip and commissure.

Physician, ophthalmology, and anesthesia opinions were obtained and their recommendations followed. Informed consent for surgical management was obtained from the patient and her family prior to proceeding.

The patient underwent open reduction and internal fixation under naso-endotracheal intubation, along with wound debridement, wound toileting, and primary closure of the lower lip laceration, performed under general anesthesia. The procedure was completed over approximately three hours, with successful anatomic reduction and stabilization achieved.

Postoperatively, the patient was managed with intravenous antibiotics, analgesics, proton pump inhibitors, antiemetics, intravenous fluids, and other supportive medications. Her clinical condition stabilized, and she remained hemodynamically stable throughout her ward stay, with progressive clinical improvement. She was subsequently discharged in stable condition.

At discharge, the patient was advised to continue supportive medications, avoid washing the face directly, bathe daily with appropriate precautions, perform mouth-opening exercises, use mouthwash, and maintain a soft diet for at least three months. A topical ointment was prescribed for local application over three weeks. She was counselled to seek immediate medical attention in the event of high fever, severe headache, vomiting, loss of consciousness, chest pain, breathlessness, or wound/pus discharge or bleeding, and was advised to follow up with Dr. R. Rajendra Prasad after 10 days.



DISCUSSION

This case illustrates the typical presentation and management pathway for a comminuted mandibular fracture resulting from high-impact trauma. Consistent with the literature, the mechanism here — a road traffic accident — reflects one

of the most common causes of mandibular fracture, and the multi-site involvement (symphysis, parasymphysis, body, dento-alveolar structures, and overlying soft tissue) reflects the substantial force typically involved in such injuries. Multidisciplinary evaluation, including physician, ophthalmology, and anesthesia input, was an important step in this case given the extent of facial trauma and the need to rule out associated injuries prior to definitive surgical management. Open reduction and internal fixation remains a standard approach for achieving anatomic reduction and stable fixation in comminuted mandibular fractures, allowing for early return to function while minimizing the risk of malunion or nonunion.

The favorable outcome in this case — stable postoperative recovery without reported complications such as infection or malocclusion at discharge — underscores the value of timely diagnosis, coordinated multidisciplinary input, and adherence to established treatment goals: anatomic reduction, restoration of occlusion, infection prevention, and avoidance of malunion or nonunion. Continued follow-up will be necessary to confirm long-term functional and esthetic outcomes, including occlusal stability and any need for further dental rehabilitation given the avulsed teeth.

CONCLUSION

Comminuted mandibular fractures following high-impact trauma such as road traffic accidents require prompt, systematic evaluation and multidisciplinary management. In this case, timely surgical intervention with open reduction and internal fixation, combined with appropriate perioperative and postoperative supportive care, resulted in a stable clinical outcome. This case reinforces the importance of a structured approach to complex maxillofacial trauma, from initial stabilization through long-term follow-up.

Consent

Written informed consent was obtained from the patient for the publication of this case report. All identifying details, including the patient's name, have been withheld to protect confidentiality.

Conflict of Interest

None declared.