



## Surgical Intervention of Compound Mandibular Para-symphyseal Fracture with Open Bite Correction: A Case Report

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**ABSTRACT:** Mandibular fractures that are delayed or poorly handled can result in a number of problems, including poor bone repair, disordered occlusion, and facial deformity. Many techniques have been used, depending on the type of fracture, the patient's age, and the surgeon's preference. This study's aim is to demonstrate how to manage a delayed reported mandibular fracture while correcting an open bite using maxillomandibular fixation (MMF) with orthodontic elastics, as well as open reduction and internal fixation (ORIF). A 23-year-old male was a victim of motorcycle accident reported thirteen days later with complaints of pain, open bite, and inability to open the mouth. A computed tomography (CT) revealed fractures in the para symphysis, zygomatic, and orbital floor regions. MMF with an arch bar and orthodontic elastic was placed to correct the open bite. The patient underwent open reduction and internal fixation (ORIF) of the symphyseal fracture with 02 miniplates (2.0mm system), 04 holes, and 04 screws in tension and compression regions successfully. A final review 6 months later revealed satisfactory mouth opening, occlusion, and symmetrical facial proportion.

**KEYWORDS:** Mandibular fracture; maxillomandibular fixation; open reduction; internal fixation.

### I. INTRODUCTION

The jaw is considered the strongest bone in the facial skeleton. Mandibular fractures are one of the most frequently occurring injuries to the facial skeleton. Road traffic accidents, interpersonal violence, and industrial accidents are some of the common reasons. However, severe injuries to the mandibular condyle, angular fractures, and body fractures are frequently seen due to their exposed position and anatomical structure [1]. Mandibular fractures most frequently occur at the condyle, then at the angle, para symphysis, and body. The gold standard for

identification and location of fractures, as well as for determining extension and three-dimensional visualization, is computed tomography (CT) scan of the face [2]. Closed fracture reduction by maxillomandibular fixation with eyelet wiring and arch bars, acrylic splinting, orthodontic vacuum-formed thermoplastic splints, orthodontic brackets, and elastics are some of the treatment options for moderately displaced fractures. Open reduction internal fixation is recommended for severely displaced fractures [3]. Fracture of the zygomatic complex is one of the most common facial injuries in maxillofacial trauma and predominately appears in young adult males. The main clinical features of zygomatic complex fractures include diplopia, enophthalmos, subconjunctival ecchymosis, extraocular muscle entrapment, cosmetic deformity with depression of the malar eminence, facial widening, malocclusion, and neurosensory disturbances of the infraorbital nerve [4].

The objective of the study is to report a clinical case of a patient victim of a motorcycle accident presenting a compound fracture of the mandible submitted to surgical treatment with intraoral access to the fracture line. Furthermore, MMF with orthodontic elastic was attached to correct the open bite.

### II. CASE REPORT

A 23-year-old man came into our clinic with the major complaints of discomfort, difficulty opening his mouth, and difficulty chewing. Thirteen days prior, the patient had a history of a road traffic accident (RTA). Physical examination revealed significant occlusal changes, sublingual haematoma, poor oral hygiene status, stable maxilla, no crackling, and mobility in the manipulation of the lower jaw and enlargement of the anterior oral region with preserved facial mimics. After clinical evaluation, and CT scan findings, he was diagnosed with a compound mandibular fracture in the para symphysis region, a



zygomatic fracture involving the right orbital floor as shown in Figure 1. However, the condyle and angle of the jaw did not exhibit any signs of fractures, as shown in Figure 1 (B).

The patient underwent open reduction and internal fixation (ORIF) of the para symphyseal fracture. After obtaining informed consent, the patient positioned in a supine position, nasotracheal intubation under general anesthesia, asepsis and antisepsis with chlorhexidine, apposition of operative fields, installation of an oropharyngeal plug, infiltration in the region of the mandibular body to the right and left mandibular angle and extra oral with 2% lidocaine with 1,200,000 epinephrine, in the case of body fracture. Our procedure included subperiosteal detachment, fracture exposure, reduction, and fixation using 02 plates (2.0mm system), 04 holes, and 04 screws in the tension and compression regions as shown in Figure 2 (A). After fixation, the surgical area was irrigated with 0.9% saline extensively and sutured with flat suture 4-0 vicryl internally and 5-0 nylon for skin. Removal of the oropharyngeal plug, removal of the operative fields, and extubating without complications. Maxillomandibular fixation (MMF) is used by using an arch bar and orthodontic elastics as shown in Figure 2 (B) to

immobilize the fractured segments, open bite correction, and allow osseous healing. Orthodontic elastics are attached to correct the open bite on the right upper premolars to the right lower canine, the upper and lower incisors anteriorly, and the upper right premolar to the lower lateral incisor area. Instead of using wire, orthodontic elastic was chosen for MMF in order to gently correct the open bite without applying pressure to the location of the zygomatic fracture, which would prevent the area's osseous healing from taking place.

The patient was given Cefuroxime 500mg every eight hours for seven days, dexamethasone 4mg every eight hours for three days and Ibuprofen 400 mg for seven days with gastric medicine and discharged after 48 hours. Guidance was also given on diet and care for the surgical wound. In the first week of postoperative period, slight inflammation in the surgical site, limited mouth opening, and a surgical wound without signs of infection was observed. The fixation plate was removed 2 months post-operatively and an oral examination revealed satisfactory bite correction as shown in Figure 2 (C); and a final review 6 months later revealed satisfactory mouth opening, occlusion, and symmetrical facial proportion.

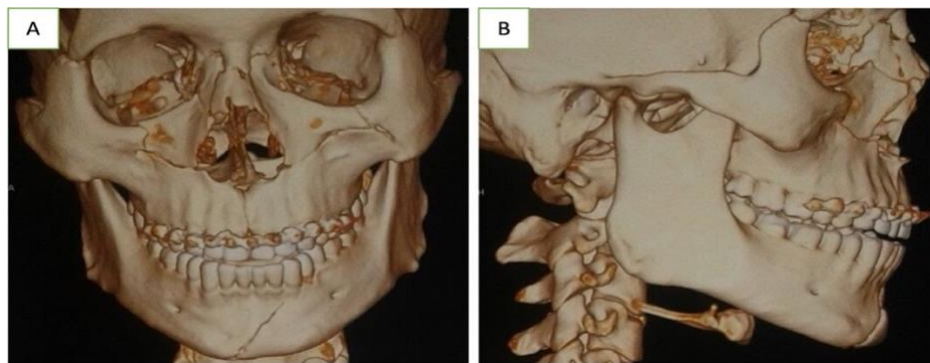


Figure 1: CT scan showing compound mandibular fracture in the para symphysis region, zygomatic fracture involving the orbital floor (A). No signs of fracture in the condyle and angle of the mandible



Figure 2: 02 miniplates (2.0mm system), 04 holes and 04 screws, tension and compression regions (A), Maxillomandibular fixation (MMF) is used by using arch bars and orthodontic elastics (B)



### III. DISCUSSION

Mandibular fracture is the second most frequent fracture of the facial bones, standing out among etiologic agents and motorcycle and automatic accidents after physical attacks. Delayed and poorly managed mandibular fractures can result in a variety of complications, including poor bone healing, deranged occlusion, and facial deformity. The current study demonstrated the surgical intervention of a compound mandibular fracture in the para symphysis region, which was reported thirteen days after the accident. Different methodologies have been executed depending on the type of fracture and age of the patient. In the case of greenstick fracture or non-displaced fracture, conservative management is suggested. Close observation, a soft diet, and analgesics will suffice. In the case of a displaced fracture, close or open reduction with fixation is indicated. In the case of a moderately displaced fracture, a closed fracture reduction technique is the ideal treatment [3]. The treatment of ZMC fracture is controversial; it depends on the circumstances, personal preference, and experience of the surgeons. There are different treatment modalities, either non-surgical or surgical, that range from simple closed reduction without any fixation to complex ORIFs. In the present investigation, the mandibular fracture was treated surgically. However zygomatic and orbital fractures were advised to undergo close observation following immobilisation by maxillomandibular fixation using an arch bar and orthodontic elastics [5]. The primary complaint of the patient, which was the difficulty to open mouth, open bite, brought on by a fractured mandible. Moreover, we haven't seen any periorbital swelling, subconjunctival haemorrhage, diplopia, or cheek flattening. For this reason, immobilization and monitoring of the zygomatic and orbital fracture area have been chosen as a possible treatment. Using an arch bar and orthodontic elastics linked to the arch bar, MMF was done to correct the open bite by applying gentle tension to both jaws.

### IV. CONCLUSION

This study demonstrated the use of MMF with an arch bar and orthodontic elastics, ORIF with miniplates, and delayed surgical therapy of a compound mandibular fracture with anterior open bite correction. However, due to the absence of external clinical symptoms and patient complaints, zygomatic and orbital floor fractures were placed under close observation.

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