



Case Report

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Open reduction and internal fixation of mandibular left parasymphiseal fracture and conservative management of bilateral condylar fracture in a pillion rider- “Rules should be followed not ignored”

Karthik.S¹, S Kumaravel¹, K Velavan², Mukundan RN³, Evangeline Cynthia D⁴, Rajprabha⁵

¹ Consultant Dental Surgeon, Consultant Oral and Maxillofacial Pathologist, Department of Dentistry/Oral and Maxillofacial Pathology, Kasthuri Multispecialty Hospital, West Tambaram, Chennai- 600045, Tamilnadu, India

² Consultant Oral and Maxillofacial Surgeon, Department of Dentistry/Oral and Maxillofacial Pathology, Kasthuri multispecialty Hospital, West Tambaram, Chennai, 600045 Tamil Nadu, India

³ Consultant Oral and Maxillofacial Surgeon, Department of Dentistry/Oral and Maxillofacial Pathology, Kasthuri multispecialty Hospital, West Tambaram, Chennai, 600045 Tamil Nadu, India

⁴ Consultant Physician/Sonologist, Department of Dentistry/Oral and Maxillofacial Pathology, Kasthuri multispecialty Hospital, West Tambaram, Chennai, 600045 Tamil Nadu, India

⁵ Consultant Oral and Maxillofacial Radiologis, Department of Dentistry/Oral and Maxillofacial Pathology, Kasthuri multispecialty Hospital, West Tambaram, Chennai, 600045 Tamil Nadu, India

Abstract

Maxillofacial injuries sustained through Road traffic accidents (RTAs) is one of the leading causes of hospitalization in India. Numerous factors such as ever increasing amount of two wheelers, assault conditions, lack of safety measures such as helmets, seat belts and lack of strict implementation of such rules, prevailing socioeconomic, cultural and environmental factors results in a substantial number of facial fractures from RTAs. By 2020, RTA injuries will rise as the 6th major cause of death worldwide. One of the most commonly employed means to thwart such RTAs include the use of helmet, following speed limits, obeying stop signs and traffic signals. Among two wheelers, the use of Helmets plays a crucial role in protecting the cranial vault and potentially the facial skeleton if a full face helmet is used. 25% of the RTAs are caused due to two wheelers rather than four wheelers. Pillion rider, who ride passenger behind the rider on a two wheelers more susceptible to morbid injuries due to lack of safety measures like not wearing a helmet, improper sitting patterns especially by females in India. A study showed injuries such as contusion and skull fractures are common when riding pillion. Here we report a case of mandibular symphysis fracture along with bilateral subcondylar fracture with medial displacement of the fractured segment sustained via RTA while riding pillion.

Keywords: Maxillofacial injuries, Parasymphiseal fracture, Bilateral condylar fracture, Road traffic accidents (RTAs).

INTRODUCTION

Maxillofacial injuries sustained through Road traffic accidents (RTAs) is one of the leading causes of hospitalization in India. Numerous factors such as ever increasing amount of two wheelers, assault conditions, lack of safety measures such as helmets, seat belts and lack of strict implementation of such rules, prevailing socioeconomic, cultural and environmental factors results in a substantial number of facial fractures from RTAs. [1] By 2020, RTA injuries will rise as the 6th major cause of death worldwide [2].

The maxillofacial compartment are more injury prone due to its specificity of the anatomical location. Injuries to this region are the results in serious dysfunctions due to the close proximity with the brainstem and the brain coupled together with maxillofacial injuries, the damages to the central nervous system often occur and prove to be fatal [3]. The U-shaped mandible is the most prominent facial bone and a common site of trauma, constituting 12%–56% of facial fractures [4][5].

One of the most commonly employed means to thwart such RTAs include the use of helmet, following speed limits, obeying stop signs and traffic signals. Among two wheelers, the use of Helmets plays a crucial role in protecting the cranial vault and potentially the facial skeleton if a full face helmet is used. 25% of the RTAs are caused due to two wheelers rather than four wheelers [6]. Pillion rider, who ride passenger behind the

***Corresponding author:**

Dr. Karthik.S

Consultant Dental Surgeon,
Consultant Oral and
Maxillofacial Pathologist,
Department of Dentistry/Oral
and Maxillofacial Pathology,
Kasthuri Multispecialty
Hospital, West Tambaram,
Chennai- 600045, Tamilnadu,
India

Email:

drkarthiks1981@gmail.com

rider on a two wheelers more susceptible to morbid injuries due to lack of safety measures like not wearing a helmet, improper sitting patterns especially by females in India. A study showed injuries such as contusion and skull fractures are common when riding pillion [7]. Here we report a case of mandibular symphysis fracture along with bilateral subcondylar fracture with medial displacement of the fractured segment sustained via RTA while riding pillion.

CASE REPORT

A 45 year old male reported to the OPD with alleged history of RTA caused by collision with a four wheeler while riding pillion. He had fell face first and hit a rock. The rider was left with a few minor scratches and was relatively unscathed since he was wearing a helmet. The pillion rider's history revealed he was not wearing a helmet at the time of the accident, there was no bleeding from the cranial region on the spot of injury, he was conscious and did not have an episode of dizziness or seizure. He was quickly referred to a maxillofacial surgeon/dentist. On clinical examination, he had facial asymmetry, deviated TMJ movements with minor lacerations over the left side of his lower lip. Bimanual palpation of the condylar region revealed no mobile fragments. Intraorally, occlusion was found to be deranged with limited mouth opening (26mm) with no visible damage to the dentition. The patient was advised to undergo magnetic resonance imaging (MRI) scan of the head and neck to rule out any potential injury to the central nervous system (CNS) and the spinal vertebrae. All hematological investigations were carried out along with three dimensional facial computed tomography (CT) scan. The scan revealed a left sided parasymphyseal fracture of the mandible and bilateral sub-condylar fracture with medial displacement of the condylar head (Figures 1-6).

ORIF (Open Reduction and Internal Fixation) for the parasymphyseal fracture and conservative IMF (Inter Maxillary Fixation) using Erich arch bar for planned for treating the condylar region. The patient was admitted and under general anesthesia, Degloving incision was given intraorally at the depth of the vestibule extending from right central incisor to second premolar region. The mentalis muscle was identified and cut in oblique fashion leaving some muscle behind for bone closure. The periosteum was divided and subperiosteal dissection was done to identify and isolate their mental nerve. The bone was then exposed. The bony segments were reduced. Fixation was then carried out using two parallel titanium plates with 4 holes one below the other. Two 2 mm plates with 4 holes were fixed using four 2 x 6 mm and four 2 x 8 mm screws. Based on Champy's lines of osteosynthesis. The plate was contoured according to the external surface of the cortex so that it lies passively. The occlusion was carefully checked. Drilling was then carried out through the holes in the plate perpendicular to the surface of the bone and the screws were fixed. The lower plate was first fixed followed by the subapical plate. 8 screws fixed in total. A gap measuring 4-5 mm was given between the two plates to neutralize torsional forces. The closure was completed in layers with interrupted suture.

For the Bilateral condylar fracture with medial displacement of the condyles, Internal maxillary fixation using Erich's arch bar wiring was done with 26 gauge stainless steel wires (Figure 7). The arch bar fixation was kept in place for 6 weeks for achieving normal occlusion the patient was placed on a liquid diet. After 6 weeks, the arch bar was removed. The patient was educated, taught mouth opening exercises with a wooden spatula for three weeks. After 2 review sessions, the healing was very satisfactory and uneventful. The patient was subsequently lost to future follow up.

DISCUSSION

Mandible fractures are the most common fractures when facial trauma occurs and they account for approximately 23.8–81.3% of all maxillofacial fractures. Condylar fractures account for 17.5–52.0% of all mandibular fractures [8]. Multiple fractures are alarming as they have

been associated with the highest risk for postsurgical sequelae, such as persistent pain, malocclusion, and facial contour deformity [9].

In a study by Olsen *et al.* Of the 935 mandibular fractures in his study, condylar and subcondylar fractures were the most common, constituting 29.1% of the total fractures. Fractures to the angle of the mandible accounted for 24.5% and symphysis or parasymphysis fractures for 22%. the condylar region is still the most common site (30.9%). Symphysis-type fractures are also common (27.7%) [10]. The highest occurrence of facial trauma has been commonly reported in the third to fourth decade of life citing peak social activities and male population is more involved compared to female population. [11] [12]

Mandibular parasymphyseal fractures lead to the loss of occlusion with step deformity formation. Torsional and compressive areas should be taken into account when treating such cases. The forces are usually exerted along the inferior border and tensional forces acting on the superior border tend to pull the segments apart creating the gap. In treating such cases, reduction and stabilization of the anterior fracture is crucial for the restoration of the transverse dimension of the mandible, followed by condylar management. Condylar fractures account for about 29%–52% of all mandibular fractures and bilateral Condylar involvement is a common finding in cases of motorcycle accident, where a direct blow to the mandible in the symphyseal or parasymphyseal causes condylar fracture. [13] [14]

The etiological factors contributing to higher incidence of RTAs include poor road conditions, driving under influence, poor road safety awareness, violation of speed limit, ignoring stop signs and traffic signals and not wearing helmets. Though, the use of helmets has been made compulsory, the strict adherence to the law is yet to be seen. with latest trend, half face helmets are more popular sacrificing safety for comfort. These helmets do not cover the face and it leads to more facial injuries. In curbing the incidences of RTAs, The government of Tamil Nadu under motor vehicles act of 1988 have made an amendment enforcing mandatory use of helmet by pillion riders travelling on motorcycles.

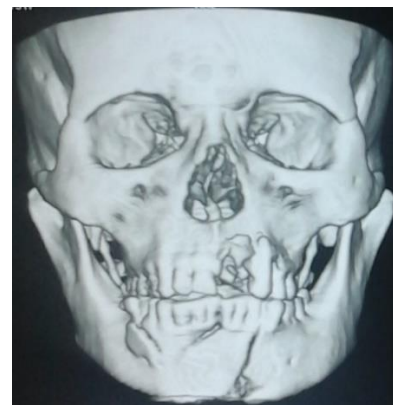


Figure 1: 3D Facial CT Coronal View

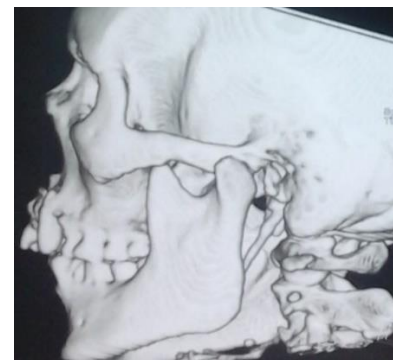


Figure 2: Left Lateral 3d Facial Ct View

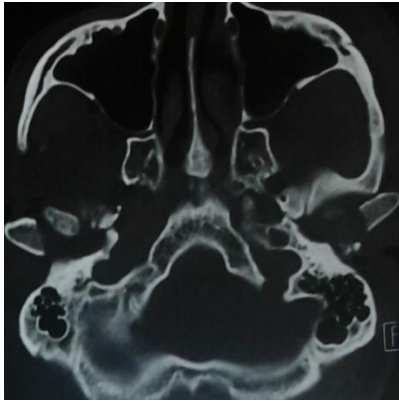


Figure 3: Facial Ct Axial View

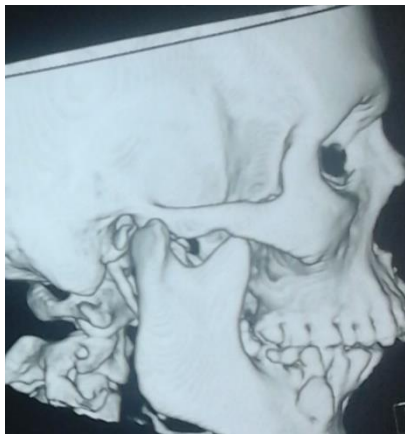


Figure 4: Right Lateral 3d Facial Ct View



Figure 5: 3d Facial Ct Basal View



Figure 6: Facial Ct Coronal View



Figure 7: Postoperative View

CONCLUSION

Mandible is the most commonly fractured bone in the craniofacial skeleton due to its anatomic location especially through RTA. Pending no other systemic injuries, such mandibular and Condylar trauma should be tended to without any significant delay thereby minimizing the postoperative complications and restores the full function of the mandible. The importance of wearing helmets by pillion riders should be re-emphasized with more awareness and strict rules should be enforced by the administrative authorities.

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Conflict of Interest

The authors declare no conflict of interest.

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