

Case Report

Management of mandibular parasymphysis fracture: a case report

Desak P. K. Wedayanti^{1*}, Gusti N. K. Dinatha², Putu Gosen Partama³,
Made Kurniawan Ardi Saputra³

¹Faculty of Medicine, ²Department of General Surgery, Udayana University, Sanglah General Hospital, Denpasar, Bali, Indonesia, India

³Department of General Surgery, Tabanan General Hospital, Tabanan, Bali, Indonesia

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***Correspondence:**

Dr. Desak P. K. Wedayanti,

E-mail: kuntiw12@gmail.com

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ABSTRACT

Mandibular fractures are among the most common injuries to the facial skeleton. Mandibular parasymphysis fractures lead to the loss of occlusion with step deformity formation. Treatment of mandibular fractures aims to restore occlusion and function and facilitate direct bone healing by adequate reduction and immobilization on the fractured site. We report a mandibular parasymphysis fracture of 17 years old male patient due to the road traffic accidents. Patient reported severe jaw pain during movement and abundant intraoral bleeding was observed. A clinically computed tomography scan of the face with axial, coronal, and 3-D reconstruction was performed, which showed parasymphysis fracture. The following treatment done was the application Arch bar and open reduction internal fixation (ORIF) mini plate under general anesthesia. After access, mandibulomaxillary fixation was performed to ensure satisfactory occlusion after adequate fragment reduction. The fractures were properly fixed with 6 hole and 3 hole, screw 8mm for the left mandibular, and for the right mandibular used 5 hole and 3 hole, screw 8 mm. Mandibular fractures are the most common fractures of facial region and treatment options depend upon the type of fracture of mandible according to the anatomic variations.

Keywords: Fracture, Parasymphysis, Mandibular

INTRODUCTION

One of the most severe injuries are caused by automobile accidents but many others result from interpersonal violence, industrial accidents, sports, home accidents and missiles or gun shots. Road traffic accidents (RTA) have been reported as a leading cause of mandible fractures. Being the most prominent mobile bone of the facial skeleton, mandibular fractures are among the most common injuries to the facial skeleton, with a 6:2 proportion between mandibular and zygomatic fractures.

Majority of the mandibular fractures occur in young males. In general, incidences of fractures of the mandibular body, condyle, and angle are relatively similar, while fractures of the ramus and coronoid process are rare.¹

Several classifications of mandibular fractures using nonstandard terminology are available. One of these classifications is related to the anatomical site involved: symphysis, body, angle, branch, condylar process, coronoid process, and alveolar process. The symphysis is bound by vertical lines distal to the lower canines. Fractures in this region, when not located in the midline, are commonly referred to as parasymphysis fractures. Together they can be referred to as the chin or mental region.²

Mandibular parasymphysis fractures lead to the loss of occlusion with step deformity formation. Forces of compression acting on the inferior border and forces of tension acting on the superior border tend to pull the segments apart creating the gap/step. Mandibular

unfavorable parasymphysis fractures need to be treated by open reduction and internal fixation to compensate both the forces and form a neutral zone. Management of injuries in the maxillo-facial complex remains a challenge for oral and maxillofacial surgeons, demanding both skill and a high level of expertise.³ Treatment of mandibular bone fractures requires certain considerations compared to other fracture treatments. The emergency treatment takes precedence. Treatment of mandibular fractures aims to restore occlusion and function and facilitate direct bone healing by adequate reduction and immobilization on the fractured site.⁴

CASE REPORT

A 17-year-old man, accompanied by his family, complained of pain in his body and face after falling from a motorcycle approximately 30 minutes before entering the hospital. At this time, the patient reported severe jaw pain during movement and abundant intraoral bleeding was observed. The patient had drunk alcohol before falling. The patient rides a motorcycle, it is estimated that he fell by himself then the patient rolls over and after that the patient immediately runs off by himself, no one sees the incident and the patient cannot be asked for information. Patient gave positive history of pain in left mandible anterior region and in right anterior.

Physical examination revealed the presence of mandibular mobility caused by fracture in mandibular parasymphysis and active bleeding from the fractured sites and limited mouth opening. On extra oral examination, there was laceration and swelling present. On intra oral examination, there was step present in relation to left mandible canine region with premature occlusion present in right region. A clinically computed tomography scan of the face with axial, coronal, and 3-D reconstruction was performed, which showed parasymphysis fracture.

Patient was planned for arch bar and open reduction internal fixation (ORIF) mini plate under general anesthesia. Arch bar fixation was achieved with split bar in step region. Arch bar is measured to fit from first molar to first molar. The arch bar is placed in such a way that the hooks face towards the gingival margin. Now 15 cm of 26 gauge wires is taken and starting from distal tooth, the wire is passed from buccal to lingual side below the arch bar and from lingual to buccal above the arch bar and twisted together. This was continued for all teeth and arch bar was secured. An arch bar was fixed in upper and lower jaw by ligature wire.

Following pre-anesthetic evaluation, patient was intubated under general anesthesia for ORIF mini plate. Intra oral vestibular incision was taken extending from left central incisor to left second premolar exposing the parasymphysis fracture site. After access, mandibulomaxillary fixation was performed to ensure satisfactory occlusion after adequate fragment reduction. The fractures were properly fixed with 6 hole and 3 hole,

screw 8mm for the left mandibular, and for the right mandibular used 5 hole and 3 hole, screw 8 mm.

Incision was closed in layers using resorbable sutures in the deep layers and subcuticular suturing was done using non-absorbable suture. Intraoral incision was closed using non absorbable suture. After extubated, maxilla mandibula fixation (MMF) was performed to immobilize fracture segment. Post operatively patient was examined and arch bar planned removed after six weeks.



Figure 1: 3D reconstruction computed tomography (CT) showing mandibular parasymphysis fracture.



Figure 2: Surgical exposure of fractured segments.

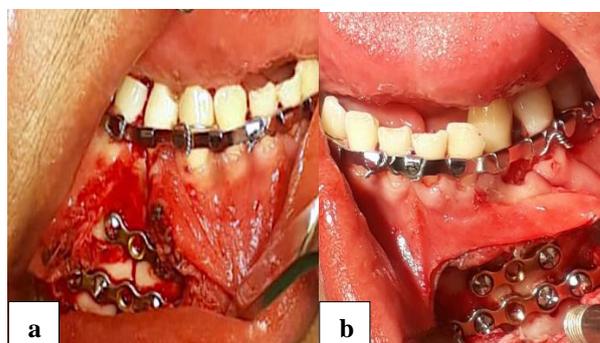


Figure 3: Intraoral access - reduction and fixation with 2.0 mm system plates (a) right side, and (b) left side.



Figure 4: Postoperative tomography.



Figure 5: Maxilla mandibula fixation.

DISCUSSION

Mandibular fracture is the second most frequent fracture of facial bones, standing out among etiologic agents and motorcycle and automatic accidents after physical attacks. They can extend over regions (branch, angle, body, parasymphysis and symphysis), involving unusual regions and neighboring structures. They can be classified depending on the tissue impairments that have been affected, the action of the masticatory muscles and their anatomical location. The most affected region are the angle and parasymphysis.⁵

The diagnosis of fractures in the mandibular body and symphysis is based on clinical examination and image analysis such as radiographs and computed tomography scans of the face. During anamnesis, it is important to investigate the cause of trauma, as well as its magnitude, strength, and direction, since the injury mechanism can provide valuable insights into the type of fracture suffered. Evidence shows that motorcycle accidents tend to result in high rates of mandibular fractures in the parasymphysis region.⁶

Definitive treatment of mandibular fracture aimed to reposition the fracture segment into normal anatomic position (reduction) and keep it from moving with fixation. Furthermore, immobilization is used to stabilization fragment when healing process occurred.⁷ In this case, the treatment of mandible fracture is fixation and immobilization with arch bar wiring and ORIF mini plate.

This arch bar is connected to a hook on the outer surface with a flat malleable stainless steel metal strip, making it more effective, faster, and easier when fixed. The bar is available in rolls. Bars are cut according to the length of the dental arch, and this will reduce injury to the soft tissue with prominent edges.

The treatment of parasymphysis fractures by open reduction aims to improve the position of the fractured bone fragments, avoiding medial rotation of the mandibular bodies, which could cause important facial changes and reduce masticatory efficiency. In this case, the fractures were properly fixed with 6 hole and 3 hole, screw 8 mm for the left mandibular, and for the right mandibular used 5 hole and 3 hole, screw 8 mm. Two plates were placed directly above the inferior border. The other plates were placed considerably higher in the central portion of the mandible underneath the tooth roots, following the recommended guidelines for the fixation of these types of fractures. Stainless steel circumdental wires were first used to reduce the displacement of the fractured fragment. Nevertheless, posterior displacement of the fragment occurred in the patient, which caused airway obstruction. After installation of the titanium miniplates, the wires were removed.

Fractures of symphysis and parasymphysis region can be managed in various ways. MMF is a technique to immobilize the fractured segments of the mandible by externally locking the occlusion into place, using the dentition as a point of stability. Fixation with MMF can be performed in several ways. Arch bars provide the next level of MMF stability, alignment, and control and have become the standard of care for treatment with MMF, as they provide an additional structure for fixative support besides the dentition. Fixation with MMF screws is not without its own complications. With chronic, repeated stress, MMF screws can lose their purchase in bone and adequate immobilization may be lost. One study advises caution, as long term fixation (greater than 5 weeks) with screws may not be as efficacious as that with arch bars due to screw loosening.⁸

Complications after repairing mandible fracture rarely occur. The most common complication in mandible fracture is infection or osteomyelitis, which can be caused by nonunion or malunion. Other complaints that can be occurred are a form of prolonged pain and discomfort in the temporomandibular joints due to changes in position and instability between the left and right temporomandibular joints. It does not only affect the temporomandibular joints, but the masticatory muscles and the muscles around the maxillofacial can also provide pain response.⁹

CONCLUSION

Mandibular fractures are the most common fractures of facial region due to their prominent position. Treatment options depend upon the type of fracture of mandible

according to the anatomic variations. Skilled work of the surgeon decides the pros and cons associated with the treatment plan and outcomes.

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