

Management of Right Parasymphysis and Condylus Mandible Fracture with Combination Open and Closed Reduction: A Case Report

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Abstract: Mandible fractures are extremely frequent in maxillofacial trauma, accounts for 19-52% involve the condyle and if not treated incorrectly can lead to significant functional and aesthetic sequale including facial a symetry, malocclusion, temporomandibular joint dysfunction and osteomyelitis. This case report presented a treatment of parasymphysis mandible fracture with open reduction and unilateral condyle fracture with closed reduction. A 35-year old female patient came to our department with fracture of lower jaw and bleeding at fracture site due to motorcycle collision. Radiography showed fracture lines at right parasymphysis and right condyle. Open reduction treatment was performed for parasymphysis fracture and closed reduction followed with embankment bites to treat the condyle fracture. The purpose of this treatment combination was to minimize pain, prevent infection, restore occlusion, restoring of curved jaw bone, stabilizing the fracture for healing process, maintain general condition, and to restore the masticatory function. In condylar fracture, whilst rigid internal fixation provides stabilization and allows early mobilization could optimize healing process. Management of mandibular parasymphysis fractures and unilateral condylar fractures using a combination of open and closed reduction can significantly improve occlusion and mouth opening. Good treatment results can be achieved by considering fracture conditions to determine the appropriate treatment method for the patient.

Keywords: Condyle fracture, Closed reduction, Open reduction, Parasymphysis fracture

1. Introduction

Mandible is the strongest bone of facial skeleton but it is fractured most frequently because of its prominent position, anatomic configuration, mobility and less bone support. It is the only mobile bone of facial skeleton and it plays an important role in mastication, phonation, deglutition and maintainance of dental occlusion.¹

Mandibular fractures can be caused by trauma with 50.8% through vehicle accident, fall 22.3%, violence or fighting 18.8%, working accidents 2.8%, sports accidents 3.7% and other accidents 1.6%. Traffic accidents are the factors that

most commonly occurs in young adult population. The highest incidence seen in the age group 21-30 years with ratio of men and women 3:16.^{1,2}

The location of the mandibular fracture can be divided based on the anatomical region involved, which are fractures of the symphysis, parasymphysis, the body, ramus, the angle, condylus and coronoideus. Fractures of the mandible due to trauma sometimes also involve fractures of the condyle, it could be unilateral and bilateral (Fig 1). Treatment of mandibular parasymphysis fractures and condyle fractures have different considerations in the stages of treatment.³

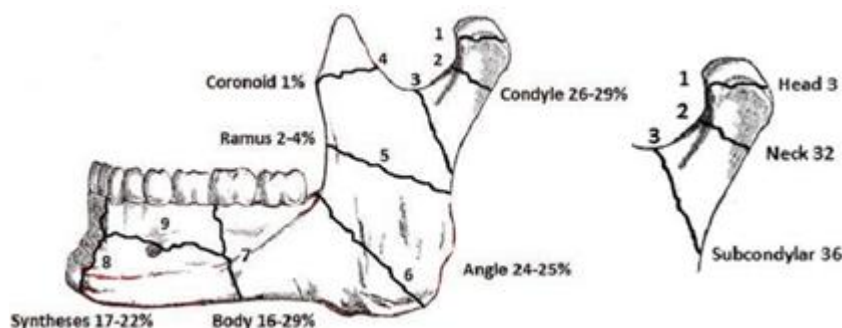


Figure 1: Mandibular fracture location by anatomic region

The following case report discuss the treatment of right parasymphysis mandibular fracture with Open Reduction Internal Fixation (ORIF) and closed reduction using embankment bites on the right region of molars for condyle fracture .

2. Case Report

A 35-year old female patient referred to our department of Oral and Maxillofacial Surgery HasanSadikin general hospital with fracture of lower jaw and bleeding at fracture

Volume 8 Issue 2, February 2019

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site due to motorcycle collision happened 5 hours earlier. By general examination, the patient was fully alert with Glasgow Coma Scale (GCS) 15. Extra oral examination showed asymmetrical face with oedema and hematoma at chin and right submandibular with mandibular deviation to the right side, limitation of mouth opening was noticed along with pain at the right temporomandibular joint. There are multiple lacerated wounds at the facial region and intra-oral region at lower lip, gingiva and vestibule. There was a displacement fracture fragment between left lower canine and lateral incisor. Dental examination showed

dentoalveolar fractures and avulsions of several anterior teeth (Fig 2). Head radiograph and OPG showed fracture lines at right parasymphysis and right condyle. Open reduction treatment was performed for parasymphysis fracture and closed reduction followed with embankment bites to treat the condyle fracture (Fig 3). Alveolectomy, tooth extraction, suturing and application of interdental wiring using arch bar was performed at emergency setting. The patient then scheduled to do open reduction and internal fixation (ORIF) surgery electively through outpatient unit.



Figure 2: Profile picture and intra oral view

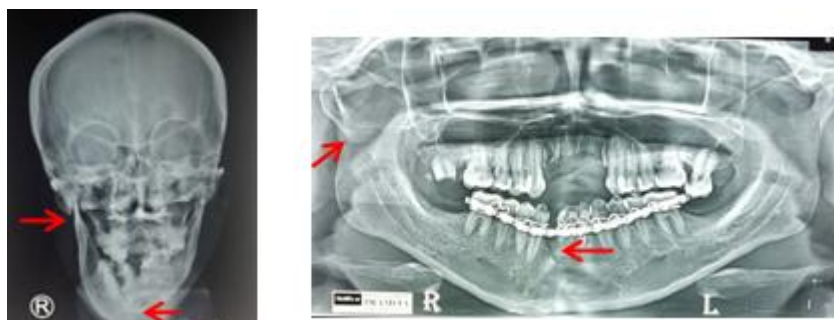


Figure 3: Head x-ray (left) and OPG (right) showed a fracture of right parasymphysis and right condyle (red arrows)

The ORIF was performed using extra oral approach. Incision was made through submental region and dissection was done until the fracture line was visible. Reduction of fracture was made using two bars miniplate and screw on the right parasymphysis of mandible region (Fig 4).

was noticed then the wire IMF was apply to preserve the occlusion (Fig 5). The patient was discharged and was followed up every week through outpatient unit. At one month follow up, the wire IMF was removed. No asymmetrical face was noticed, the occlusion has set to normal with no deviation on mouth opening and close (Fig 6).



Figure 4: Intra operative findings. Fixation of fracture was done using miniplate and screw



Figure 5: Intra oral view on first day after surgery (left) and third day after surgery (right). Noted the occlusion has reach normal contact.

On day one after surgery, the embankment bites was placed on the right molar region followed with intermaxillary fixation (IMF) using elastic bands at anterior and posterior left region. The diet was liquid and blended during this phase. On third day after surgery, the elastic bands was removed and the occlusion was evaluated. Good occlusion



Figure 6: Intra oral view at one month follow up. Noted the occlusion was normal, the mouth opening was good with no pain and no deviation.

3. Discussion

Mandible is a strong bone, but at some region that found their weak areas. Mandibular corpus region mainly consist of dense cortical bone with little spongy substance as the passage of blood and lymph vessels. Thin region in the mandible is angle and subcondyle that is section includes a weak region of mandible.⁴

Management of mandible fracture can be achieved by closed reduction or conservative and open reduction or surgical method depend on the indication. Indication for closed method are favorable non displaced fracture, grossly comminuted fracture, the fracture occur at mandible without teeth or atrophy, fracture in children that involve the growth of teeth, coronoid fracture and simple condyle fracture. Unfavorable displaced fracture has to be treat with ORIF especially if there is a segment shifting. ^{5,6}

Mandibular condyle fracture treatment is still controversial, especially because of many modalities offered a wide range a wide range literature. Mandibular condyle fracture treatment goal is to restore function of masticatory system like origin. Mandibular condyle fracture treatment may be use by closed method or conservative and open method or surgical.^{6,7}

Condyle fracture require special handling, if its not included criteria to open method this fracture can be treated with closed method for 2-3 week to provide the formation of fibrous tissue at fracture fragment. If condyle fracture accompanied by other type of mandibular fracture then condyle fracture treated with closed method and non condyle fracture treated with ORIF.^{5,6}

Condyle fracture that needs to be treated with open reduction include displacement of condyle to cranial fossa media, lateral extracapsular dislocation of condyle, bilateral condyle fracture in edentulous patient, bilateral condyle fracture or unilateral if splinting is not recommended for general state of patient or because physiotherapy is not allowed, bilateral condyle fracture result by comminuted fracture of central face, ankylosis of mandibular condyle due to trauma and delayed treatment, and complex or multiple facial fracture. Patient with a high risk of fracture such as decreased lung function, gastrointestinal disorders, patient with psychiatric or neurological problem also an indication for treatment with open reduction surgery.^{5,6}

Conservative method for condyle fracture varies from no fixation to employing various fixation devices such as a used

of vertical elastic bands combined with simple muscle training and early mobilization ^{8, 9}

On this case report, the patient received a combination of fracture reduction type. Her parasymphysis fracture was treated using open reduction method and the condyle fracture was treated using closed reduction method. Since the condyle fracture anatomy was in the glenoid fossa, and the displacement was minimal therefor the closed reduction combined with embankment bite are the best option. This type of combination aimed to restore occlusion and function.

Open reduction are giving advantage in fracture with displaced bony fragment as it can reduce the displacement into the most ideal anatomical site by a direct approach to the fracture site. In addition, it can prevent complications such as respiration disorder, pronunciation disorder, and severe nutritional imbalance by shortening IMF period through rigid fixation. Disadvantage of open reduction that is an invasive treatment, which may cause injury of nerves or blood vessels during operation, and postoperative complications including infection. In addition, it has permanent scar though the surgery is conducted after designing the incision line considering aesthesis.¹⁰

Advantages of closed reduction with functional therapy is relatively safe treatment. No injury of nerves and blood vessels occur during the treatment, and no postoperative complications such as infection or scar occurs. In particular, complications such as fracture, loss, and eruption delay of the growing teeth can be avoided in pediatric patients as no tooth germ injury occur because of no establishment of the crown of the permanent teeth. Longterm IMF has disadvantages of the injury of the periodontal tissue and buccal mucosa, poor oral hygiene, pronunciation disorder, imbalanced nutrition, mouth opening disorder and respiration disorder. In the case of conservative treatment using closed reduction, the growth disorder and excessive growth of the injured mandible may occur due to inappropriate reduction of bone fragments and the right and left displacement of the mandibular ramus or mandibular deviation upon opening may occur after conservative treatment.¹⁰

4. Conclusion

Management of mandibular parasymphysis fractures and unilateral condylar fractures using a combination of open and closed reduction can significantly improve occlusion and mouth opening. Good treatment results can be achieved by considering fracture conditions to determine the appropriate treatment method for the patient.

References

- [1] Noreen R., Khan M., 2014. Characteristics of Symphysis and Parasymphysis Mandibular Fracture. Pakistan Oral & Dental Journal. Vol. 34.
- [2] Fonseca R.J. et al, 2005. Oral and Maxillofacial Trauma, 3rd Ed, St Louis : Elsevier Saunders
- [3] Brennan J.A., et al, 2012. Resident Manual of Trauma to the Face, Head, and Neck, 1st Ed, American Academy of Otolaryngology – Head and Neck surgery.

- [4] Hupp JR, Ellis E, Tucker MR. 2008. Contemporary Oral and Maxillofacial Surgery. Ed. Ke-5. Mosby Elsevier. St. Louis.
- [5] Keith, 2015 .Atlas of Oral and Maxillofacial Surgery. Philadelphia: W.B SaunderCompany.
- [6] Peterson, 2002. Contemporary Oral and Maxillofacial Surgery. 4rd. Ed. Philadelphia :Mosby Company.
- [7] Chrcanovic B.R., 2012. Open Versus Closed Reduction : Comminuted Mandibular Fracturs. Oral Maxillofac Surg. Springer-Verlaq.
- [8] Miloro M. 2004. Peterson's of Principles of Oral And Maxillofacial Surgery. 2nd. Ed. BC Decker; London
- [9] Malik, Neelima Anil. 2012. Textbook of Oral and Maxillofacial Surgery. 3rd. Ed. Jaypee Brothers Medical Publishers; New Delhi.
- [10] Choi K.Y.,et all, 2012. Current Concepts in the Mandibular Condyle Fracture Management Part II : Open Reduction Versus Closed Reduction. Departement of Plastic and Reconstructive Surgery, Kyungpook National School of Medicine, Daegu,Korea. Archives Plastic Surgery Vol. 39.