

# Treatment Plan of Mandibular Condyle Fractures: Case Report and Literature Review

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**Abstract:** *The incidence of mandibular condyle fractures is relatively high due to physical trauma, especially traffic accidents. Condyle fracture treatment needs careful consideration because the condyle is one of the unique parts of the joint. Mistreatment can lead to complications such as ankylosis or impaired mandibular movement. The purpose of writing this article is a case report of condylar fracture treatment planning based on the literature review. It was reported that an 18-year-old male patient came to the emergency department of Hasan Sadikin Hospital in Bandung with bleeding from the oral cavity due to a traffic accident. Clinical symptoms include lacerations on the lips, chin, gums, bleeding, and facial asymmetry. The clinical examination and radiographic diagnosis of this case were bilateral condyle fractures, mandibular symphysis, and dentoalveolar fractures. The treatment plan for this case was Open Reduction Internal Fixation (ORIF) due to multiple fractures and condyle neck fracture.*

**Keywords:** Mandibular condyle fracture, multiple fractures, Open Reduction Internal Fixation (ORIF)

## 1. Introduction

Fractures in the maxillofacial region can cause serious problems such as high morbidity, loss of function, and aesthetic effects. Condylar fractures are the most common sites of mandibular fractures. The condition can be treated with surgical treatment or conservative treatment. Surgical treatment or open reduction of condylar fractures, generally performed using titanium plates and screws or interosseous wire fixation. Meanwhile, conservative treatment or closed reduction with intermaxillary fixation using various materials such as wire or elastic couplers. [1], [2]

The choice of treatment for condylar fractures must consider the presence of teeth, the height of the fracture, the patient's adaptability, the patient's masticatory system, impaired occlusal function, and mandibular deviation.[1] Surgical treatment is becoming more common because, through this treatment, an anatomical reduction that resembles normal conditions can be achieved, and the healing of joint function and surrounding soft tissue is better than other treatments. However, there are complications, one of which is neurological damage due to surgery. [3]

Condylar fractures caused by trauma, especially traffic accidents, are generally accompanied by crown fractures and avulsions. An impact on the chin causes the force to be transmitted to the condyle or the opposing maxillary anterior teeth. Interdisciplinary care is needed to complement surgical treatment so that the patient's condition can return to normal both in terms of function and esthetics.[4] The following case report aims to explain the management plan for bilateral mandibular condyle fractures based on the literature review.

## 2. Case Report

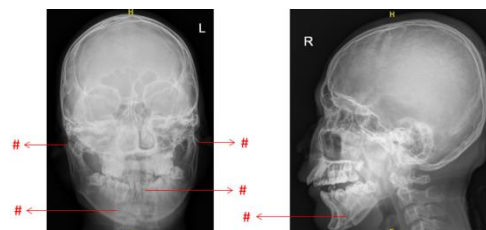
An 18-year-old male patient came to the emergency department of Hasan Sadikin Hospital Bandung with bleeding from the oral cavity and facial asymmetry due to a traffic accident. The patient is a referral from another

hospital and has been treated temporarily. Extraoral examination revealed facial asymmetry, edema of the mandible, and situational sutures to the chin wound of about 3 cm. Intraoral examination revealed lacerations on the lower lip with a size of 3x2x1 cm, lacerations on the gingiva of teeth 12-21, and teeth 41-42. Teeth 12-21 were avulsed with an anterior open bite (Fig.1).



**Figure 1:** Extra-oral and intra-oral clinical features

On AP and lateral radiographic examination, dentoalveolar bone discontinuities were seen in the mandible, condyle bone, and mandibular symphysis (Fig. 2). The clinical diagnosis was bilateral condylar fractures, mandibular symphysis, and segmented dentoalveolar fractures in the regions of teeth 41-42, teeth 12-21, with avulsion of teeth 12, 11, 21. Treatment of this case consisted of alveolectomy of teeth 12-21, wound debridement, suturing of laceration wounds in the intraoral and extraoral areas, installation of the Erich arch bar in the upper and lower jaw. The patient was given antibiotics and analgesics. The following treatment plan is open reduction internal fixation (ORIF) for bilateral condyle fractures and mandibular symphysis.



**Figure 2:** Schedel photo shows fracture lines on bilateral condyles, symphysis and alveolar bones



**Figure 3:** Clinical picture after debridement, suturing and fitting of Erich archbar

### 3. Discussion

Condylar fracture is one of the fractures involving the temporomandibular joint so that it can cause disturbances in the function and anatomy of the temporomandibular joint.[5] In some literature, it is known that the incidence of condylar fractures is around 26-57% of all mandibular fractures,  $\pm$  84% are unilateral condylar fractures, and men are more common than women with a ratio of 3:1. The highest incidence is in patients between the ages of 20-40 years. The most common causes are violence, trauma during sports, falls, and traffic accidents. The locations that most experienced fractures were the subcondyle 62%, the neck of the condyle 24%, and the intracapsular 14%. [4],[5] Trauma to the mandible that causes fracture of the condyle neck can cause inflammation of the temporomandibular joint called retrodiscitis. Two types of trauma cause this disorder, namely extrinsic and intrinsic trauma. The presence of extrinsic trauma such as a blow to the chin causes a sudden movement of the condyle to the retrodiscal tissue so that the condyle moves posteriorly. [4]

Pain and trismus in the TMJ (Temporo Mandibular Joint) area is the most common symptom accompanying condylar fractures, and it will get worse when moved so that the patient limits the movement of his jaw. Condylar fractures may also be accompanied by localized swelling and crepitus in the TMJ area. Most of the patients also complained of malocclusion. Sometimes there is bleeding from the ear.[1],[5] The state of the mouth and occlusion should be carefully examined. In cases of unilateral condylar fracture, usually caused by a unilateral impact, the midline of the chin and mandibular teeth deviates to the involved side, resulting in a posterior open bite on the other side, and the patient is unable to close the mouth. In bilateral condylar fractures, which are generally due to symmetrical force collisions, it does not show a shift in the midline of the chin, but there is a protrusive mandible that can cause an anterior open bite. Other symptoms include limited movement and difficulty speaking and swallowing. In bilateral condylar fractures, if the patient tries to open his mouth, there will be pain and difficulty in movement. [6]

Condylar fractures are classified according to the degree of inclination, the presence of a compound or comminuted injuries, displacement, and the presence or absence of a dislocation of the head of the glenoid fossa. However, the most commonly used is the Lindahl classification, which is based on the degree of fracture height, based on the relationship of the condyle to the mandible, and based on the relationship between the head of the condyle and the glenoid fossa.[7].[8]

Management of Open Reduction Internal Fixation (ORIF) is performed on severe fractures. This procedure allows direct

visualization and reduction of the fractured bone segment. Installation Plates and screws serve to rigidly bind and prevent movement of the fracture segments by absorbing all or part of the functional load present at the fracture site. Sorting the appliance and method of fixation is based on the quality of the fractured segment bone and the intrinsic strength of the mandible. [9]

Condylar fractures are the most common facial fractures, but there is debate over the choice of the most appropriate treatment.[10] In a meta-analysis involving 23 published studies, Al-Moraissi et al. determined that patients treated with ORIF had less pain and better occlusion than those treated with Close Reduction.[11] Shiju et al. compared ORIF and Close Reduction in 50 randomized patients with fractures of the mandibular condyle and showed that both treatments had similar results. acceptable. [12]

Vesnaver et al. compared the outcome of treating patients with unilateral extra-articular mandibular condyle fractures surgically and conservatively. In that study, surgical treatment was associated with less ipsilateral chin deflection at mouth opening, less asymmetry of lateral and condylar movements, less occlusal disturbance, less facial asymmetry, faster-chewing rehabilitation, and asymmetry—smaller bite force between injured and uninjured sides. However, no difference was found between the two groups in maximal mouth opening or joint pain. [13]

Kotrashetti et al. have shown that the ORIF procedure is more technically demanding and is associated with certain postoperative complications. Recent meta-analyses favor ORIF over Close Reduction concerning mobility, malocclusion, pain, and chin deviation at mouth opening, but ORIF is associated with a higher risk of infection.[14] In Kuang's 2019 observational study, patients treated with ORIF had an increased risk of infection. the risk of a longer hospital stay, higher medical costs, and the possibility of developing a hematoma, but have a lower risk of wound complications than patients with Close Reduction care.[10]

In this case, the choice of a condylar fracture treatment plan by ORIF is appropriate. Consideration of treatment plan in this case due to multiple fractures involving the alveolar bone, symphysis, and bilateral condyles, avulsion of several teeth, and severe mandibular deviation. Bilateral condylar neck fractures, in this case, favored treatment with ORIF. The choice of treatment with ORIF was judged to be best for fracture discontinuities or significantly displaced bone and for patients who wanted a faster return of jaw movement. Future standardization of fracture classification schemes and treatment modalities will help select the best course of action for each case.[15]

### 4. Conclusion

The choice of a condylar fracture treatment plan was based on the results of the clinical and radiographic analysis, which included the severity of the malocclusion, the number of fracture lines, the location of the fracture line, the displacement of the fracture fragment, the number of tooth loss and the involvement of the surrounding vital tissues.

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