

Management of Unilateral Neglected Corpus and Condylar Fracture due to Motor Accident: Case Report

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Abstract: ***Introduction:** Late-treated maxillofacial fractures can lead to complications and complex definitive care. The purpose of this case report is to discuss the management of a neglected unilateral corpus fracture and condyle fracture due to a motor accident. **Case Report:** A 20 years old female patient came to Hasan Sadikin General Hospital in Bandung complaining that her jaw could not open and close her mouth due to a fall from a height of 3 meters approximately 1.5 months earlier. The patient was not properly treated, so he was diagnosed with a neglected unilateral corpus fracture and condyle fracture. The treatment, in this case, was mandibular corpus fracture with open reduction, internal fixation, and condylectomy. **Conclusion:** Treatment of unilateral neglected corpus and condyle fractures with a refracturing and condylectomy approach can restore masticatory function with minimal defects.*

Keywords: Neglected fracture, mandible corpus, condyle, condylectomy, ORIF

1. Introduction

Fractures in the maxillofacial area vary significantly in severity; some involve one bone or several complex bones, depending on the level of force that impacts the bone. Maxillofacial fractures can result in deformity and loss of facial function, affecting the patient's social life.¹ Motor vehicle accidents often cause maxillofacial trauma, sports trauma, falls, violence or fights. Fractures in the maxillofacial area often occur in the mandibular bone with an average incidence of around 70%, and from that amount, other types of fractures always follow 15%.² Mandibular fractures can be classified in a variety of terminologies that have not been standardized, namely simple, compound, greenstick, comminuted, pathological, multiple, impacted, atopic, indirect, and complex fractures. However, some classify mandibular fractures based on the anatomical region involved, such as symphysis, body, angle, ramus, condyloid process (condyle), coronoid, and alveolar.³

Condylar fracture involves the temporomandibular joint, which causes joint disorders such as ankylosis and other mandibular movements. Condylar fractures can occur in several parts that, include condylar head (62%), condylar neck (24%), and intracapsular (14%). Condylar fractures can also coincide with symphysis fractures.⁴ Combined symphysis-condylar fractures represent a unique and unstable pattern of injury that can cause significant morbidity. Mandibular body fractures have an incidence of 19.5%.⁵ Symphysis-condylar

fracture management is to provide treatment to improve long-term outcomes.⁴

Neglected maxillofacial fracture defined as discontinuity of facial bone structures that are not handled or handled correctly, resulting in a state of delay in treatment usually accompanied by injury in surrounding tissues. Several factors may contribute incidence of neglected fracture, especially in the developing country, such as the availability of proper facilities at the hospital, distant location, and patient refusal for treatment could lead to the patient's neglect.⁵ The management of facial fractures aims to restore function and aesthetic reconstruction. However, the difficulty of surgery may increase if delay allows osseous callus formation and soft tissue fibrosis. The technical difficulty has been suggested by some to be associated with a greater incidence of complications.⁶

Patients often do not realize Condylar fractures due to the insignificance of the symptoms, delays in having an orthopedic surgeon appointment due to the lack of parental awareness, financial constraints, unavailable health care facilities, and cases of fractures handled by osteopaths beforehand.⁶ The management of condylar fractures requires special attention and can be done by closed or conservative and open or surgical methods. If surgery is delayed, it will allow the formation of bone callus and soft tissue fibrosis. Many complications can also arise from adjacent organs associated with the fracture site, which may or may not be

repaired due to delayed reconstruction. Delay in treating bilateral condylar fractures can result in malocclusion, facial asymmetry, limited jaw movement, and pain in the temporomandibular joint (TMJ).⁷ A mandibular condyle fracture may cause long-term complications such as mandibular growth and functional disorders and chronic temporomandibular joint (TMJ) complications such as TMJ ankylosis especially in children [1]. Therefore, to prevent these complications, early recognition and management of condylar fracture are paramount.⁸ This case report discusses the successful treatment of neglected unilateral corpus and condylar fractures due to motorcycle accidents.

2. Case Report

A 20-year-old female patient came to Hasan Sadikin Hospital Bandung, complaining that her jaw could not open and close her mouth. About 1.5 months earlier, the patient had an accident from falling from a 3 meters high ladder and hitting

her face on the floor. The patient seeks treatment at private clinics and hospitals but is only given medication, and no action is taken. History of fainting (+) 1 hour, nausea and vomiting (+), bleeding from the nose (+) and bleeding from the right ear (+). History of 3 doses of COVID-19 Vaccine (+). Extra oral examination: facial asymmetry (Figure 1). Intraoral: mouth opening +/- 1.5 cm, anterior open-bite occlusion, teeth 21-22 avulsion (Figure 2).

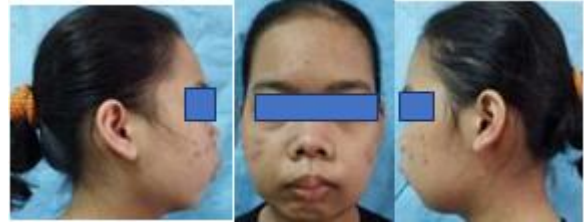


Figure 1: Extra Oral Facial Asymmetry



Figure 2: Intra Oral: The patient has been exposed to Erick Bar wiring, anterior open bite occlusion, and teeth avulsed.

Panoramic radiological examination showed a radiolucent image on the left corpus resembling a fracture line with irregular edges. On the right condyle there is a discontinuity in the bone (Figure 3).



Figure 3: Radiolucent image on the left mandibular corpus, there is an image of the discontinuity of the right condyle

The head CT scan without contrast showed an impression of a linear fracture of the left maxillary alveolar process and a complete fracture of the mandibular body to the left mandibular process. There were no signs of intracranial bleeding (Figure 4).

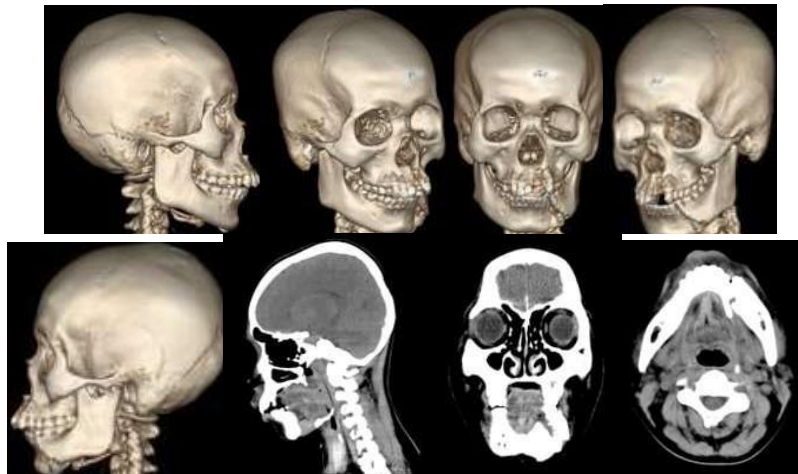


Figure 4: Linear fracture of the alveolar process of the left maxillary bone and complete fracture of the mandibular corpus to the left mandibular bone

This case was diagnosed with a neglected, left mandibular corpus fracture and right condyle fracture. The treatment for this case was a mandibular corpus re-fracture, open reduction

internal fixation (ORIF) with two mini plates and 15 screws size 8 mm and 10 mm, condylectomy, and coronoidectomy on the right side (Figure 5).



Figure 5: Right condylectomy and coronoidectomy, mandibular corpus refracture, and plate installation

The patient was given Ceftriaxone injection 2x1 gram, Ketorolac injection 2x30 milligrams, Omeprazole injection 2x40 milligrams, Dexamethasone injection 3x5 milligrams, Aloclair gargle, and Ikamycetin to treat intraoral and extraoral scars post-operation. The follow-up treatment that was done was masticatory muscle physiotherapy. The patient returned to control on the 14th day post-surgery with the NGT and IMF tubes still attached (Figure 8); during the control, the patient complained of discomfort with the wires and rubber used and difficulty cleaning teeth. The patient came back for control a month after surgery, did not use the IMF and NGT tubes (Figure 9), the patient's mouth opening was visible +/- 2.5 cm, and did not feel any complaints.



Figure 6: Day 1 post-operation. Occlusion intact, the patient still feels uncomfortable in the operating area

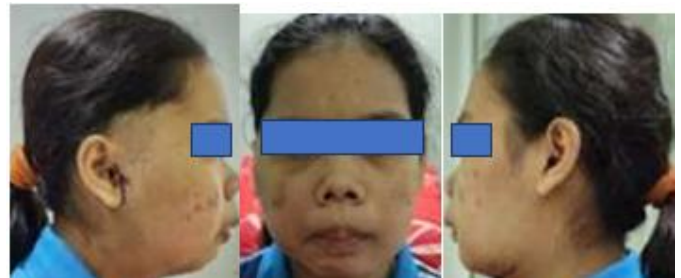




Figure 7: Day 2 post-operation



Figure 8: 14th day of post-surgery control, the patient still had the IMF wire and NGT tube attached.



Figure 9: 1-month post-surgery control, there were no complaints from the patient, intact occlusion

3. Discussion

The condyle is a part of the mandible that sits on the vertical crest of the mandibular ramus and forms a joint with the temporal bone through the glenoid fossa. Bone fracture is a break in the continuity of the bone, either partially or entirely. Fractures can occur anywhere in the human body, including the facial area, and can be accompanied by soft tissue damage.¹

According to Barrera et al., the etiology of mandibular condyle fractures was due to motorcycle accidents (43%), assaults/fights (34%), work accidents (7%), falls (7%), sports accidents (4%) and other causes (5%).¹¹ The highest incidence was in patients aged between 20 and 40. In this case, the patient was caused by falling from a height and hitting her face on the floor; the patient then complained of not being able to open and close her mouth correctly. The mouth opening has deviated to the right, and swellings on the ear. This clinical finding shows the clinical symptoms of one-sided condylar fractures.^{9,10,11}

The objects that cause fractures can affect the type and number of the fractures; if the object is large, it can cause multiple fractures in more than one location and vice versa due to the impact that is only concentrated in one location.^{12,13} Anterior force that directly hits the chin can create a bilateral condylar fracture, while the force towards the parasymphysis can cause a contralateral condylar fracture or mandibular angle.^{12,13} A patient with teeth locked at the time of impact will cause an alveolar or tooth fracture.³

Changes in occlusion can result from tooth fracture, alveolar fracture, mandibular fracture in any location and trauma to the temporomandibular joint and muscles of mastication. Premature contact of posterior teeth or open anterior mastication may result in bilateral condylar fractures or angles.^{13,14} Retrognathic occlusion is usually associated with condylar fractures, or angle and prognathic occlusion may occur in very prominent temporomandibular joint fractures^{9,10}; every patient with mandibular condyle fractures has restricted mouth opening. However, actual mandibular condyle fractures or associated facial fractures result in abnormal mandibular movement. The deviation of opening to the fractured side of the mandibular condyle is a classic example of a condylar fracture. Deviation occurs because the lateral pterygoid muscle that functions on the unaffected side is not neutralized by the lateral pterygoid muscle, which does not function on the opposite side. Thus a deviation occurs. Lateral mandibular movement can be inhibited by condyle and ramus fractures with displacement of the bones.^{4,12}

The classification of condylar fractures, according to Lindahl (1977), is based on several factors, namely

- 1) The anatomical location of the fracture,
- 2) The relationship of the condyle segment to the mandibular segment,
- 3) The relationship of the condyle to the glenoid fossa.

This classification system requires radiographic imaging, which obtains at least two images from the right angle.⁷ Classification of condylar fractures consists of three, namely the height, the relationship between the condyle to the mandible, and based on the relationship between the head of the condyle to the glenoid fossa.¹² In this case, according to the classification of the fracture height, the fracture was at the head of the condyle.

Neglected maxillofacial fracture is defined as the discontinuity of the facial bone structure that is not treated or wasn't treated properly, resulting in a delay in treatment, usually accompanied by injury to the surrounding tissue. Several factors that cause neglected fractures, especially in developing countries, include the availability of adequate hospital facilities, remote locations, and patient refusal to seek treatment which causes patients to be neglected. Lack of awareness by hospital staff of maxillofacial problems can also lead to misdiagnosis during the initial evaluation, resulting in delays or inappropriate treatment of facial bone fractures.¹⁴ In this case, a neglected condyle fracture occurred due to the patient's lack of awareness of the symptoms she experienced at the beginning of the accident because the symptoms were very minimal. In addition, patients cannot reach a specific hospital for treating facial bone injuries and can only go to the nearest clinic.

The delay between injury and treatment for facial fractures can be divided into the following groups: delay between injury and presentation to health care, the delay between presentation to health care and diagnosis, and the delay between diagnosis and treatment. Factors that influence each group may differ¹². On the other hand, delaying facial reconstruction is sometimes intentionally left for a second stage operation due to certain conditions, including the presence of concomitant injuries (e.g., cerebral injuries, thoracic injuries, abdominal injuries)¹³. The relevance of delay from injury to treatment is commonly disputed amongst surgeons and works of literature. Prominent surgeons have previously advocated delays from injury to surgery of no more than 24, 48, and 72 hours, retrospectively¹⁴

The treatment of mandibular condyle fractures is still controversial, mainly due to various modalities offered by various literature. The goal of condyle fracture treatment is to restore the function of the masticatory system to its original state; the reconstruction involves the relationship between the fracture segments, occlusion, and maxillofacial balance. Treatment of condylar fractures can be done conservatively or with closed and surgical or open methods.^{6,13}

In this case, the condyle fracture was treated with the condylectomy technique. Condylectomy is a surgical intervention done to reduce pain in the TMJ that is indicated only when conservative therapy fails, and radiological examination shows a picture of severe condylar damage. The principle of condylectomy is the surgical reduction of the condylar head, thus eliminating permanent irritation and pressure on the TMJ nerves. The loose connective tissue containing many blood vessels, nerves, and peripheral nerves

is placed posterior to the head of the condyle, which binds the articular disc posteriorly to the capsule.⁶

The most significant disadvantage of the condylectomy procedure is a facial and occlusal deformity. The lateral pterygoid muscle is sacrificed due to the procedure that arrests forward movement and removes inhibition factors, resulting in only rotational, non-translational movements. The ramus shortens, resulting in an open mastication and mandibular retrusion. This operation is the last resort after other operations have failed. Occlusal adjustments can correct slight deviations after surgery. Preservation of the meniscus is essential to prevent adhesions between the pieces of the fragment left in the glenoid fossa, which can result in jaw deviation to the surgical site. Jaw movement after surgery should not be restricted; the jaw should be moved as much as possible. Complications of mandibular condylar fractures during treatment are rare. The most common is Ankylosis, which can be classified based on the degree of limitation, location of attachment, and type of tissue involved.^{13,14}

4. Conclusion

Treating neglected unilateral corpus and condylar fractures with a refracturing and condylectomy approach can restore masticatory function and minimal defects. Regular control of masticatory muscle physiotherapy is necessary to treat condyle fractures to optimize masticatory function.

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