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Management of Chronic Dislocation of the Temporomandibular Joint Accompanied by Neglected Mandibular Corpus Fracture

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Abstract

Introduction: Trauma to the mandible can cause fractures and Dislocation of the temporomandibular Joint. Delayed treatment of the temporomandibular joint Dislocation can lead to complications such as facial deformity, limited mouth opening, and ankylosis of the temporomandibular Joint. This case report aims to discuss the treatment of chronic temporomandibular joint Dislocation accompanied by neglected fracture of the mandibular body.

Case Report: A 19-year-old male patient came to Hasan Sadikin Hospital in Bandung, complaining of a slanted face on the left side two months after the accident. Extra-oral clinical examination revealed an asymmetrical face and left mandibular deflection. Intraoral examination found loose teeth 11-21, 32-31, and 43-44, mouth opening of about 2.5 cm, and anterior open bite occlusion. Radiographic examination showed multiple fracture lines of the mandible in the right region of teeth 43-44 and teeth 46-47, with Dislocation of the left condyle laterally out of the glenoid fossa. The diagnosis of this case was left chronic Dislocation of the Temporo Mandibular joint accompanied by a neglected fracture of the body of the right mandible. This case's treatment includes installing arch bar wiring, refracturing, open reduction and internal fixation (ORIF), coronoidectomy and left condylectomy.

Conclusion: The management of chronic Dislocation of the temporomandibular Joint accompanied by neglected fracture of the mandibular body using refracturing, open reduction and internal fixation (ORIF), coronoidectomy, and condylectomy shows quite good results in mouth opening and function, but further physiotherapy treatment is needed to achieve optimal occlusion.

Keywords: Mandibular Fracture, TMJ dislocation, Coronoidectomy, Condylectomy, Open reduction

Introduction

Dislocation of the temporomandibular Joint (TMJ) is a condition in which the condyle exits the glenoid fossa in a superior, posterior, or anterior direction through the articular eminence and is often accompanied by spasm of the masticatory muscles.[1,2,3] The incidence of Dislocation, based on epidemiological studies, is more common in children. -children and women. A survey of TMJ disorders in Germany shows an annual incidence of dislocations of 25 people per 100,000 population.[3]

In 60% of cases, the etiology of Dislocation is caused by trauma due to falls, traffic accidents,

household accidents, violence, and other causes such as the excessive opening of the mouth when yawning, laughing, singing, prolonged mouth opening from oral procedures, and ENT. Strong anesthetic and endoscopic procedures contribute about 40%.[4] Dislocations can also be due to manifestations of psychiatric disorders.[5,6]

Mandibular Dislocation can be classified into four based on the direction:

1. An anterior dislocation is a condyle moving anteriorly from the articular eminence; this type of Dislocation is the most common and is a pathological form of joint movement.
2. Posterior Dislocation implies fracturing the skull's base or the meatus's front wall.
3. Lateral Dislocation is divided into two types: type 1 is a lateral subluxation, and type 2 (luxation) is a state of the condyle being pressed laterally and into the temporal fossa.[1,7]

Lateral dislocations are usually associated with fractures of the mandible.4 Fourth, Dislocation in a superior direction, namely Dislocation towards the cranial fossa with the middle part, is associated with a fracture in the glenoid fossa.[4] One various types of dislocations can occur through traumatic or nontraumatic mechanisms. The location of the condyles relative distinguishes types of dislocations to the articular fossa of the temporal bone.[5]

TMJ dislocations can be categorized based on time into acute and chronic.[3,6] Chronic dislocations can be chronic recurrent and persistent chronic dislocations. Recurrent chronic dislocations are dislocations of the TMJ that repeatedly occur in a short time, whereas persistent chronic dislocations are dislocations that occur for a long time.[7] Persistent chronic dislocations can also be interpreted as a state of acute dislocation that has not been treated for 72 hours or more. There is consensus that if this dislocation persists for over a month, it is called a longstanding dislocation or a protracted TMJ dislocation.[3]

The diagnosis of TMJ dislocation is usually easy to establish from clinical examination. Anterior open bite shows bilateral dislocation; unilateral dislocation has a contralateral mandibular deflection and an open bite on the ipsilateral side. The condyle is not in the glenoid fossa, so an empty area is obtained on palpation of the tragus.4 Late treatment can cause complications in facial asymmetry and interfere with mastication.[8] The prognosis of temporomandibular joint dislocation, especially chronic recurrence and chronic chronicity, is unpredictable and depends on evaluation, treatment plan, and patient cooperation. Mechanisms and treatment options for the types of temporomandibular joint dislocation need to be evaluated to get the right and efficient therapy.[9]

The mandibular bone is the most frequently fractured area due to physical trauma to the maxillofacial area. Handling mandibular fractures can cause complications, such as masticatory disorders due to malunion or nonunion. Complaints that are felt can be in the form of prolonged pain and discomfort in the jaw joint or temporomandibular Joint due to changes in position and instability between the left and right jaw joints. This complication does not only affect the joints, but the muscles of mastication and muscles around the face can also respond to pain.[8] Open bite malocclusion is an open bite that is the most significant complication of a maxillary fracture that does not receive immediate treatment or is neglected for too long, within a few days to several weeks, and is called a neglected fracture.[10]

Managing mandibular fractures is to obtain an anatomical reduction of the fracture line, regain occlusion before the injury, immobilize the mandible within a certain period for healing, maintain adequate nutrition, and prevent infection, malunion, and nonunion.[11] They are generally divided into two methods: closed and open repositioning. In closed or conservative repositioning, fracture reduction and mandibular immobilization are achieved by placing a maxillomandibular fixation device. Open repositioning of the fractured part is opened surgically, and the segment is reduced and fixed

directly using a wire or plate called wire or plate osteosynthesis.[12]

TMJ dislocation treatment methods vary, ranging from conservative treatment to surgery. The faster manual reduction is performed, the higher the treatment success rate.[5,8,9] Manual reduction of TMJ dislocations lasting more than 3-4 weeks has a meager success rate, so the treatment of choice is surgery.[3] In this case, discuss the treatment of chronic temporomandibular joint Dislocation accompanied by neglected mandibular corpus fracture due to traffic accident trauma.

Case Reports

A 19-year-old male patient complained of a slanted face on the left side of the jaw two months after the accident. At that time, the patient was riding a motorbike at moderate speed in the Tasikmalaya area, suddenly lost his balance, and fell with his chin mechanism hitting the asphalt first. The patient fainted for 10 minutes and had no history of nausea and vomiting. Primary survey examination found Airway, Breathing, and Circulating in this patient were in average condition. The patient's consciousness with GCS 15 (E4M6V5), isochronous round pupils with a diameter of 2 mm left and right, no light reflex disturbances, and no paresis was found. The secondary survey found no abnormalities.

General examination found positive skin turgor and asymmetric facial head. Eye examination Non-icteric sclera, neck examination jugular venous pressure (JVP) was not increased, submandibular lymph nodes were not palpable and painless. Examination of the thorax shows a symmetrical shape and movement. Hematological examination showed a hemoglobin count of 15.7 g/dL and a hematocrit of 46.7%. On extraoral clinical examination, the patient was found to have an asymmetrical face and left mandibular deflection. Palpate the tragus area to feel empty on the left (Figure 1). Complaints of patients unable to close their mouths were denied, but there was a slight deviation to the left lateral side.

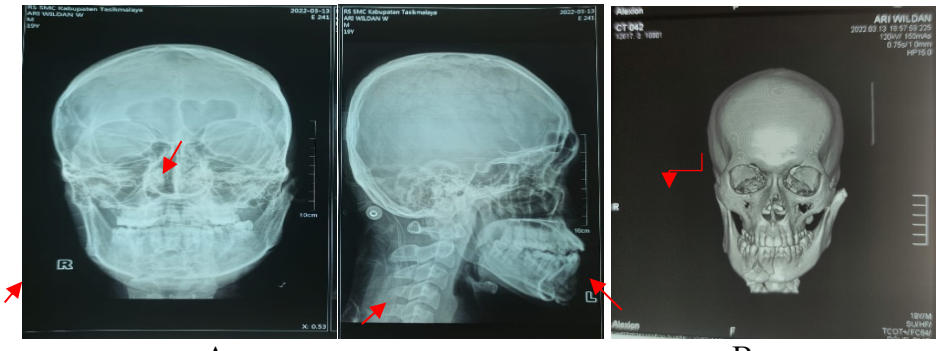
On intraoral examination, there appeared to be a generalized chronic marginal gingivitis condition, loose teeth 11-21 grade-2 and teeth 34,33,43,44,45 grade-3, mouth opening of about 2.5 cm accompanied by occlusion of anterior open bite and posterior crossbite (Figure 2). The panoramic photo investigation shows multiple fracture lines in the mandibular bone dextra teeth 43-44 and teeth 46-47, with Dislocation of the left condyle bone laterally out of the glenoid fossa (Figure 3). On the AP-Lateral Schadel photo, there appears to be a fracture line in the right mandibular bone and Dislocation of the left condylar bone that shifts laterally (Fig. 4A). Meanwhile, from the 3D photo of the head, it can be seen that the left condyle is not in the glenoid fossa and is located more to the left lateral than the articular eminence (Figure 4B).

A B C

Figure 1: A. Clinical photo of the patient seen from the right side of the patient; B. Clinical photo of the patient seen from the front. The face looks asymmetrical on the left side; C. Clinical photo of the patient seen from the left. (Source: Personal documentation)

Figure 2: Gingivitis in the lower jaw region, Occlusion open bite anterior, Crossbite posterior, with a mouth opening of about 2.5 cm (Source: Personal documentation)

Figure 3: Panoramic photo showing a fracture of the mandibular body of the dextra bone, as well as Dislocation of the left temporomandibular Joint



A B

Figure 4: A. AP-lateral view of Schadel's photo from the front and right. B. 3D photo of the head seen from the anterior, it can be seen that the left condyle is not in the glenoid fossa and is located more laterally (Source: Personal documentation)

Figure 5: Outpatient treatment was carried out by interdental wiring using an erichbar in the maxillary region of teeth 16-26 and mandible 36-46.

This patient was diagnosed with chronic left Dislocation of the Temporo Mandibular joint accompanied by a fracture of the body of the right mandible. The patient signed an informed consent for treatment agreement and approval for publication of scientific activities. The treatment plan is refracturing, open reduction and internal fixation (ORIF), coronidectomy, and condylectomy. Preparation of patients at the outpatient polyclinic before surgery is by installing interdental wiring using erichbars on the upper jaw teeth elements 16-26 and on the lower jaw tooth elements 36-46 (Figure 5). Patients are advised to consume food with a soft diet during preparation for scheduling surgery.

After the patient is intubated, stages of surgery are performed aseptically in the operating area. Adrenaline is injected into the area to be incised to minimize bleeding. Then an incision is made in the vestibule area of the lower jaw along the tooth element 36-48 dissection of the muscle layer by layer, and tooth extraction is carried out 43,44,46 on the fracture segment of the dextra mandibular parasymphysis, refracturing. After optimal repositioning of the fragments, adaptation, installation, and tightening of the arch bar of the mandibular teeth is carried out, along with the placement and installation of plates and screws in the fracture region (Figure 6). Intraoral dissection continued until the coronoid bone was opened in the left condyle region, then coronoidectomy and condylectomy in the left region were performed (Figure 6). The next stage was then intraoral suturinglayer by layer.

Figure 6: Intra-Op

Treatment after surgery in POD I was by placing intermaxillary rubber to lock the jaw, which was maintained for two weeks (figure 7).

Figure 7: Clinical photos of the patient and the condition of the intraoral POD I

Examination on the 14th day after the operation showed quite good results; no stitches were released, and the pain and swelling felt by the patient began to decrease, but the results were not satisfactory, as seen in the occlusion of the patient who still had a small anterior open bite and crossbite on the mandibular side left, the patient's mouth opening is still limited to about 3 cm (figure 7). The patient underwent an open stitch procedure on the wound and found no bleeding, secondary infection, or dehiscence conditions. The patient underwent masticatory muscle physiotherapy to achieve optimal mouth opening and occlusion.

Figure 8: Clinical photos of patients and conditions Intra oral POD XIV

Discussion

Acute Dislocation of the TMJ joint, if not treated directly, can become a chronic dislocation of the TMJ. Acute Dislocation of the TMJ that persists for more than four weeks is called a longstanding, protracted, or persistent TMJ dislocation.[6] This case is classified as a chronic TMJ dislocation accompanied by a neglected fracture of the mandibular body due to delays in proper treatment at the start of the post-traumatic event. Delays in proper treatment can make the situation more severe and require more complex treatment.[3]

Various surgical techniques for longstanding dislocations are grouped based on the duration of the Dislocation and the difficulty in repositioning the Dislocation.[3] The lightest technique, also known as level 2 or indirect reduction, is to pull the mandible using a wire wrapped around the angle of the mandible or the sigmoid notch. Mandible. Level 3 technique or called the direct reduction technique. Alternative reduction

techniques can be eminectomy and meniscectomy. If level 3 is unsuccessful, the final option is a level 4 technique, namely an orthognathic procedure or a TMJ prosthesis.[7] The treatment in this case for chronic left Dislocation of the Temporo Mandibular Joint is a surgical approach. Coronoidectomy and condylectomy procedures consider the type of chronic Dislocation and the difficulty in repositioning the dislocation. The complication that occurs if repositioning is not carried out is the occurrence of fibro-osseous ankylosis.[9,10]

In this case, immediate treatment was not carried out, so it became a neglected fracture that caused a malunion because the fractured bone fragments had fused. The fracture occurred about three months ago, so the bone has undergone remodeling. However, the alignment is incorrect; resulting in malocclusion, namely an open bite in the anterior and posterior regions.[13] The treatment for this case is mandibular refracture and ORIF using Maxillomandibular Fixation (MMF). This treatment follows the mandibular fracture management algorithm.[14,15,16]

Several risk factors are associated explicitly with mandibular fractures and can potentially cause malunion or nonunion. The most significant risk factors are infection, poor apposition, lack of immobilization of the fracture segment, foreign bodies, and unfavorable muscle pull on the fracture segment. Severe Malunion of the mandible will result in facial asymmetry and may be accompanied by impaired function. These abnormalities can be corrected by adequately planning an osteotomy to reconstruct the shape of the mandibular arch.[9]

Malunion is one of the complications of maxillary and mandibular fractures, eventually leading to malocclusion, and often cause aesthetic and functional deformities. Open bite malocclusion is an open bite due to malunion, the most significant complication of maxillary and mandibular fractures, caused by slow fracture treatment, undiagnosed fracture, or inadequate immobilization fixation.[10,17]

Conclusion

The management of chronic Dislocation of the TMJ accompanied by a neglected fracture of the mandibular body, in this case, was carried out by condylectomy, condylotomy, refracturing, and open reduction and internal fixation (ORIF), which showed quite good results functionally. The masticatory muscles' physiotherapy must be carried out routinely to achieve optimal mouth opening and occlusion.

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