

Management of Temporomandibular Joint Dislocation with Manual Reduction in Different Cases Classification: Serial Case

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Abstract: Introduction: Temporomandibular joint dislocation was a displacement of the mandibular condyle which locked in the anterior articular eminence of the temporal bone. This is a rare condition but need to be treated immediately. Objective: To describe management of temporomandibular joint dislocation in a conservative procedure for dentists. Case Report: Three different cases: unilateral anterior, bilateral anterior and unilateral lateral dislocation were reported and treated by mandibular reduction with manual manipulation. Discussion: Dislocation was a severe hypertranslation when condyle was locked in anterior of articular eminence and could not restore by itself. There were various causes regarding this case, such as yawning, laughing and prolong dental treatment. The main therapy could be done by conservative or surgical procedure. Conservative procedure performed with manual manipulation of mandible, which could be performed on acute, both of unilateral and bilateral dislocation case. In recurrent and chronic cases, surgery was the accurate treatment choice. Conclusion: Management of temporomandibular joint dislocation performed with manual reduction in conservative procedure so it could minimize discomfort and long term morbidity of patient.

Keyword: dislocation, temporomandibular joint, articular eminence, reduction

1. Introduction

The temporomandibular joint or TMJ is a ginglymoarthrodial joint whose articulation involves both sliding and hinge type movements. In the closed position, the condyle of the mandible lies in the glenoid fossa of the temporal bone.^{1,2,3} Mandibular dislocation represent 3% of all the dislocated joints in the body. This dislocation generally occurs in the second and third decades of life, but can occur in both children and adults. Females are more likely to develop TMJ dislocation, but the reason is not yet fully understood.^{2,4}

Temporomandibular joint dislocation is classified based on the position (anterior, posterior, medial, lateral, or superior), symmetry (unilateral or bilateral). Based on number of occurrences, it classified into recurrent and non-recurrent. According to the etiology, it classified into traumatic and non-traumatic spontaneous and based on time, it classified into acute and chronic. Dislocation of the joint may occurs partial (subluxation) or complete (luxation/true).^{1,2} In the case of subluxation, the patient can restore the position of the condyle into glenoid fossa alone, while in the case of luxation, patient needs another person help to restore the condyle to its original position in order to close its mouth again.^{1,2}

Anterior dislocations are the most common. Anterior dislocation occurs when the condyle leaves glenoid fossa and lies anterior to the articular eminence of the temporal bone. In normal closing, a complex series of muscle activities occur where by the mandibular condyle moved posterior to the articular eminence before being translated superiorly into the glenoid fossa. In case of TMJ dislocation,

this sequence is disrupted and the condyle remains outside of glenoid fossa.^{1,2,5,6} There are various types of activities that can cause acute TMJ dislocations such as opening the mouth too wide, chewing, laughing, in prolonged dental care, or during surgery with general anesthesia. Management of TMJ dislocations can be done with several different approaches with different success rates. This management can be done by conservative or surgical procedures.²

2. Case Report

Case 1

A 62-year-old male patient came to Emergency Room in Hasan Sadikin Hospital with a chief complaint of not being able to close his mouth since 6 hours ago after yawning. Patient claimed to have had the same history of complaints 3 times. The patient has a history of chewing on one side (right). An extraoral examination revealed the presence of facial asymmetry and mandibular deviation to the left side.



Figure 1: Extraoral presentation of right unilateral TMJ dislocation

Intraoral examination revealed radix and necrosis tooth in almost all region, as well as loss of vertical dimensions of the upper jaw and lower jaw. Based on the whole examination a diagnosis of right unilateral temporomandibular joint dislocation is made.



Figure 2: Intraoral presentation of right unilateral TMJ dislocation

Patient was given medication therapy of eperisonHCl tablet 50 mg and sodium diclofenac tablet 50mg as well as manual reduction of TMJ measures to restore the condyle position to glenoid fossa so the patient can closes his mouth again. Barton's bandage was placed for 10 days. Patient was advised to have soft diet, not to open his mouth too wide, remove radix and necrotic teeth, and making denture at the dentist.



Figure 3: Extraoral and intraoral profile after reduction

Case 2

A 27-year-old female patient came to Emergency Room in Hasan Sadikin Hospital with a chief complaint of not being able to close his mouth since 1 hour ago after the patient laughed widely. Patient claimed to have had the same history of complaints 1 time. The patient has a history of chewing on both side (right and left). Based on the results of the anamnesis, the patient feels her lower jaw is more anteriorly than the upper jaw.



Figure 4: Extraoral profile of bilateral TMJ dislocation

From intraoral examination, the patient could not close her mouth, and no other abnormality was found in the cavity

first. Based on the results of the history and clinical examination that has been performed on the patient, the diagnosis is a bilateral temporomandibular joint dislocation.



Figure 5: Intraoral picture of bilateral TMJ dislocation

In Hasan Sadikin Hospital emergency room, patient was gives medication therapy of eperisonHCl tablet 50 mg and sodium diclofenac tablet 50mg. Manual reduction measures of TMJ is done to restore the condyle position to glenoid fossa so the patient can closes her mouth again. After reduction measures, it is known that the patient has a class III Angle relationship. Patients are given the same instructions as in the first case, and are advised to consult a dentist orthodontic specialist associated with Angle class III malocclusion suffered by the patient.



Figure 6: Extraoral and intraoral profile after reduction

Case 3

A 37-year-old male patient came to polyclinic of oral and maxillofacial surgery on a referral from an OMFS in Padang. Patients complain about the unbalanced upper and lower jaws when closing the mouth and the asymmetrical face between the right and left sides. According to the patient's admission, this situation has been experienced since childhood and has never been treated. Two months earlier, the patient went to the oral surgeon in Padang City and was advised to seek treatment to RSHS to get further treatment related to his complaint. Based on the results of clinical examination, found facial asymmetry and deviation of the lower jaw to the right side.



Figure 7: Extraoral profile of right unilateral TMJ dislocation to the lateral glenoid fossa

On intraoral examination, it was found that the occlusion was not in the correct position, as well as the mandibular deviation to the right side. It is characterized by the midline of the maxillary and mandibular midline.



Figure 8: Intraoral picture of the right unilateral TMJ dislocation to the lateral side

Panoramic examination show the right condyle atrophy. From the results of 3D CT scan, the patient's right condyle position is not in the glenoid fossa, but rather the lateral glenoid fossa.

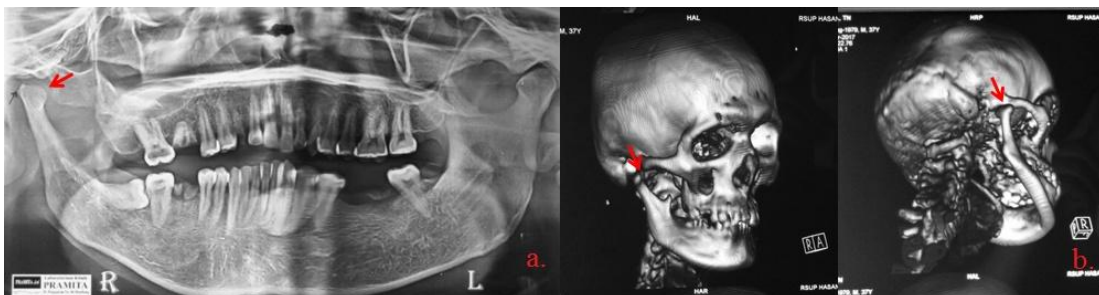


Figure 9: (a) Panoramic picture and (b) CT Scan 3D of right unilateral TMJ dislocation to lateral glenoid fossa

The facial asymmetry the patient complained of was referred to the medical rehabilitation department and was diagnosed with Bell's palsy as well as congenital strabismus. Based on an examination performed by an oral surgeon, the patient was diagnosed with a unilateral right mandibular dislocation to the lateral of the glenoid fossa. Management of this patient is manual TMJ reduction by general anesthesia. Before the measures, interdental wiring is done by using erich bar. When performing TMJ reduction measures, the maneuver performed is slightly different from the dislocation case to the anterior glenoid fossa. In this case, the right condyle is positioned to the medial side in order to return within the glenoid fossa. When normal occlusion is achieved, intermaxillary fixation is performed on the patient. Patients were given analgetic therapy to prevent post-action pain and were instructed to consume a liquid diet and regain control for open-mouth exercises and maintain intermaxillary fixation for 1 month. In relation to the patient's domicile, treatment is continued in his hometown and never controls to the OMFS department of Hasan Sadikin Hospital Bandung.



Figure 10: Intraoral picture after reduction

3. Discussion

TMJ dislocation occurs when the mandibular condyle shifts out of the glenoid fossa and moves anterior to the articular eminence of the temporal bone. Predisposing factors that may cause this dislocation include: TMJ ligament weakness, injury to the capsule and ligaments, degenerative joint disease, neurological disease, uncoupled muscle function, erosion of articular eminence, morphological abnormalities of the condyle and articular eminence, and dimensional loss physiological vertical due to tooth loss.⁷

The main problem with the TMJ reduction process is the severe muscle spasms that greatly disrupt the patient's comfort. Therefore, special attention is needed to reduce tension, anxiety, and spasm in joint muscles. This can be done in several ways, namely: to convince patients that the procedure will restore the jaw to its original position, sedation drug, do massage in the area around TMJ muscle, and manipulation appropriately.³ TMJ dislocations will usually lead to frustration and stress in patients. When the patient is unable to return the joint to its original position, the patient will be compelled to seek expert help in order to resolve the problem. Dislocations that have occurred in multiple recurring episodes will usually add to the difficulty of TMJ reduction measures. In cases of acute dislocation, TMJ reduction process can be performed without anesthesia whereas in chronic and difficult cases, local anesthetic use and muscle relaxant and analgesic drug administration are required to give comfort to patients in the reduction process.³

If the TMJ reduction is delayed long after dislocation occurs, intermaxillary fixation may help to restore the position of the condyle and glenoid fossa to its original position. The reduction procedure begins with positioning the patient. For reduction in the conscious patient, the patient is positioned to sit in a place that can support the patient's head while in the reduction under general anesthesia, the patient is positioned lying supine. Patients are given advance explanation of the procedure to be performed. Patients are instructed to relax in order to facilitate the reduction process. The operator is in the presence of the patient with both hands holding the mandible of patient. The operator's thumb is bandaged with gauze to protect the operator from the patient bite. The operator's thumbs are on the occlusal surface of the posterior tooth while the other fingers are under the chin or the inferior border of the mandible bone.^{1,3,4,7}

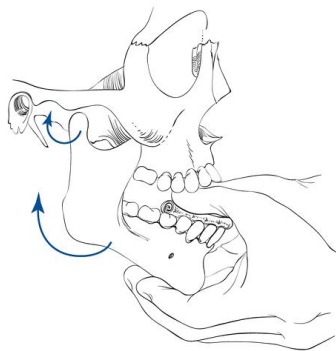


Figure 11: Operator's hand position in manual reduction of TMJ dislocation⁷

The operator shall provide controlled pressure on the occlusal surface of the mandibular posterior tooth to suppress the mandible downward and the operator's fingers on the inferior border of mandible provides a controlled upward pressure. Downward movement will help to relieve muscle spasms and will bring the condyle down the articular eminence. Upward movement will restore the position of the condyle into the glenoid fossa as in the original anatomical position. After a successful reduction process, the patient is instructed not to open his mouth too wide first, and consume a soft diet. Head bandage was placed for 10-14 days which will rest the joints in normal position. Provision of anti-inflammatory and analgesic drugs can be prescribed for 3-5 days.³ For TMJ dislocation to the lateral glenoid fossa closed reduction is one option but with different maneuvers returns the condyle into the medial position into the glenoid fossa.⁴

The case of a long-standing dislocation is the term given in cases of dislocations that occur more than one month. This condition usually occurs during the extraction procedure or tonsillectomy under general anesthesia, where the jaw is positioned for maximum openness. This dislocation can not be realized if no proper post-operative examination is performed. In such circumstances, muscle spasms may become more severe due to fibrosis of the ligaments and muscles. If this happens, the reduction under general anesthesia is the right choice. Surgical procedures can be performed on the patient as a last option. For cases of recurrent, chronic, and habitual dislocations, surgery is a procedure to be performed. These actions include: capsular plication, eminectomy, and Le Clerc procedure.^{7,8}

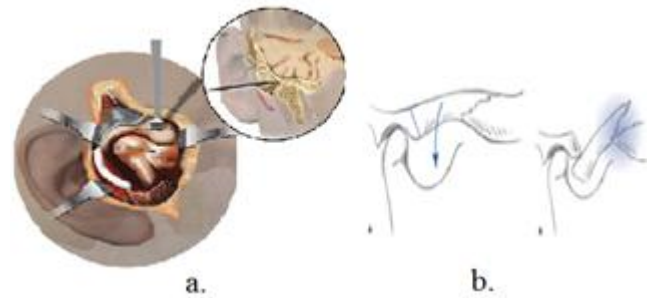


Figure 12 (a): Eminectomy procedure⁸ and 12 (b) Le Clerc procedure⁷

The principle in the capsular plication procedure and Le Clerc is to limit the movement of the mandibular condyle to the anterior glenoid fossa while eminectomy is performed by removing the tubercles and articular eminence to allow the condyle to move freely. In addition, when dislocations are associated with excessive muscle activity, injection of botulinum toxin type A into pterygoid lateral muscle is a procedure that is claimed to prevent TMJ dislocation.⁷

4. Conclusion

TMJ dislocation is a condition of where the mandibular condyle moves out of the glenoid fossa and locked anterior to the articular eminence. This situation can cause stress and frustration due to muscle spasms and pain experienced by patients. TMJ dislocations can not only occur anteriorly, but medial, lateral, posterior, superior, unilateral, and bilateral, as well as recurrent or non-recurrent, and acute or chronic. Various causes of dislocation include: opening the mouth too wide, yawning, dental procedures that were too long, degenerative joint disease, and loss of vertical dimension due to tooth loss.

TMJ dislocation management can be done conservatively with manual reduction or surgery, depending on the patient's case. In the case of acute and no other complication, manual reduction by returning the position of the condyle into the glenoid fossa can be performed. In chronic cases, high recurrences, and accompanied by muscle problems, surgery is the right choice to reduce the condyle into the glenoid fossa.

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