

## Management of temporomandibular joint dislocations in the emergency department - a case series

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### ABSTRACT

The temporomandibular joint (TMJ) or TMJ is a type of ginglymoarthrodial joint and its articulation involves both sliding and hinge type movements. Dislocation of this joint is a very painful condition and needs acute emergency care. Most of these acute dislocations can be managed by emergency physicians. However, chronic dislocations can be managed with the conservative approach. TMJ disorders are the rare complications in those patients, which are under antiretroviral therapy and until now, there are only few cases reports in the literature. We report three cases of TMJ dislocations that were managed successfully in an emergency room. No conclusive cause-effect relationship has been found linking the TMJ disorders to the human immunodeficiency virus-antiviral treatment.

**Key words:** Antiviral therapy, Emergency department, Emergency procedures, Temporomandibular joint dislocation, Temporomandibular joint

The temporomandibular joint (TMJ) is a specialized joint between the mandible and the temporal bone of the skull. The condyle of the mandible articulates in a concavity known as the glenoid fossa or the mandibular fossa [1]. The articulation of TMJ involves both sliding and hinge type movements, and dislocation of this joint is a very painful condition and needs acute emergency care. During dislocation, the condyle moves in front of the articular eminence and unable to recede back to its normal position. It can be partial (subluxation) or complete (dislocation), bilateral or unilateral, and acute or chronic (protracted or recurrent). The most common type is the anterior dislocation [1]. TMJ dislocation mostly occurs in the second and third decades of life, children and elderly may also be affected [2]. Females are more likely to develop TMJ dislocation as compare to males, but the reason for this is not yet fully understood [3,4].

### CASE REPORT

#### Case 1

A 23-year-old male patient reached the emergency ward and reported with a chief complaints of pain in the jaw, inability to open jaw (following yawning), and inability to speak. He had a similar episode for the past 3 months which had resolved spontaneously.

On examination, his vital signs were stable; the mouth was wide open, locked, and significant drooling of saliva. There

was a depression in his preauricular area with tenderness on the right side, and chin was deviated to the left side. The right TMJ dislocation was diagnosed based on the history and clinical findings. The treatment involved procedural sedation using 3 mg intravenous midazolam and 50 mg intravenous tramadol. The manual reduction was performed by placing both the gloved thumbs over the occlusal surface of lower molar teeth (with simultaneous chin elevation with fingers), and entire mandible was pushed down and posteriorly. As the initial attempt failed, we tried the same procedure keeping gauze pieces over the teeth and considerable success was achieved. Postprocedure, the patient was comfortable, able to speak, and eat. On 4<sup>th</sup> week follow-up, he was doing fine and there was no recurrence (Fig. 1).

#### Case 2

A 42-year-old female patient with the history of retropositive (human immunodeficiency virus [HIV] on antiretroviral therapy) came to the emergency department and complaints of inability to speak, pain over the jaw, drooling of saliva from the mouth, and difficulty in eating for 4 days. On examination, she was anxious. Her vital signs were normal, the mouth was wide open, and there were white plaques over the tongue and mucosal membranes, which was suggestive of oral candidiasis. Palpation over the right preauricular region suggested emptiness in the joint space. Based on the history of the patient and clinical examination, a diagnosis of the right TMJ dislocation was made.

The manual reduction was tried after giving analgesics and sedation, but initial three attempts failed. Then, the oromaxillofacial duty team was contacted, the patient was counseled once again about the procedure, and adequate sedation was given and dislocation was reduced using the wrist pivot method [5]. Postreduction, she was able to speak and the pain was relieved. She was advised to have soft diet, use of a bandage to cover head and jaw, and to keep hand below jaw during yawning. On 6<sup>th</sup> week follow-up, the patient was well and there was no recurrence (Fig. 2).

### Case 3

A 65-year-old female patient with seizure disorder presented with a reduced mouth opening during an episode of seizure. On examination, TMJ dislocation was confirmed, the reduction was performed by keeping the patient in a supine position, the physician on the head-end side, both thumbs were placed over the lower molars, and the downward pressure was applied. Postreduction, she was able to close mouth and perform routine activities. We advised soft diet and to avoid wide opening of the mouth. After 2 months, she had recurrent TMJ dislocation during a seizure episode, which was reduced successfully and advised to wear a soft cervical collar to prevent recurrence, and a dose of antiepileptics was increased to prevent seizures (Fig. 3).

### DISCUSSION

A TMJ dislocation is defined as an excessive forward movement of the condyle of mandible beyond the articular eminence with complete separation of the articular surfaces and fixation in that position [6]. Morphological variants exist based on the position of the condyle in relation to the articular eminence; these are described as anterior, posterior, superior, and lateral [6]. However, the anterior subtype is the most common. In all our cases, there was anterior dislocation of the TMJ.

By the clinical-radiological evaluation, Akinbami [7] classified TMJ dislocation into the following three types:

- Type I - The head of the condyle is directly below the tip of the eminence
- Type II - The head of the condyle is in front of the tip of the eminence
- Type III - The head of the condyle is high-up in front of the base of the eminence.

The TMJ dislocations may be further subdivided into acute or chronic conditions as follows: chronic recurrent if it appears repeatedly over a short period and chronic persistent dislocations if it persists over a long period [7,8]. Chronic persistent dislocation can be defined as an acute dislocation left untreated or inadequately treated for 72 h or more, and there is a consensus that if the situation persists for more than a month and it is labeled as long-standing or protracted TMJ dislocation [9]. This last condition is the most challenging and difficult to treat of the three.

Majority of the cases, irrespective of the clinical subtype were due to yawning [10]. In a Nigerian study of 96 patients with



**Figure 1:** In Case 1, a young boy with temporomandibular joint dislocation



**Figure 2:** In Case 2, human immunodeficiency virus patient with temporomandibular joint dislocation and on antiretroviral therapy. (a) Lateral view, (b) anterior view



**Figure 3:** In Case 3, elderly lady with temporomandibular joint dislocation

TMJ dislocations, excessive mouth opening while yawning was the most common cause of dislocation, followed by road traffic accidents and underlying systemic disease, and the most common cause of epilepsy [10]. Research has shown that the presence of underlying illness such as connective tissue disorders, Ehlers–Danlos syndrome, psychogenic, and neurological disorders, and the use of drugs containing amphetamine-like substances, contributes substantially to the etiopathogenesis of condylar dislocation [10].

HIV-infected patients often report chronic pain and pathology that targets at body joints during retroviral therapy. Although both conditions may share similar secondary disorders, no conclusive cause-effect relationship has been found linking the TM disorders to the HIV-antiviral treatment [11]. Our second patient was infected with HIV and was on antiviral therapy.

A European survey of 878 people with HIV infection on antiretroviral treatment suggested that protease inhibitors caused arthralgia. Among several cases reported of rheumatological pathology (TM dysfunction, frozen shoulder, Dupuytren's

disease, and tendinitis), most were probably related to the intake of indinavir in HIV-positive patients [12]. Florence *et al.* have reported that the TMJ complaints disappeared completely when the protease inhibitor (indinavir) was replaced with nevirapine, a nonnucleoside analog [13].

Generally, the management of TMJ dislocation depends on whether it presents as an acute, chronic, or recurrent lesion, but all the available treatment options in the literature have been categorized as either conservative or surgical. Manual reduction with or without anesthesia/analgesia remains the preferred method

#### **Protocol for managing TM joint dislocation in Emergency Department**

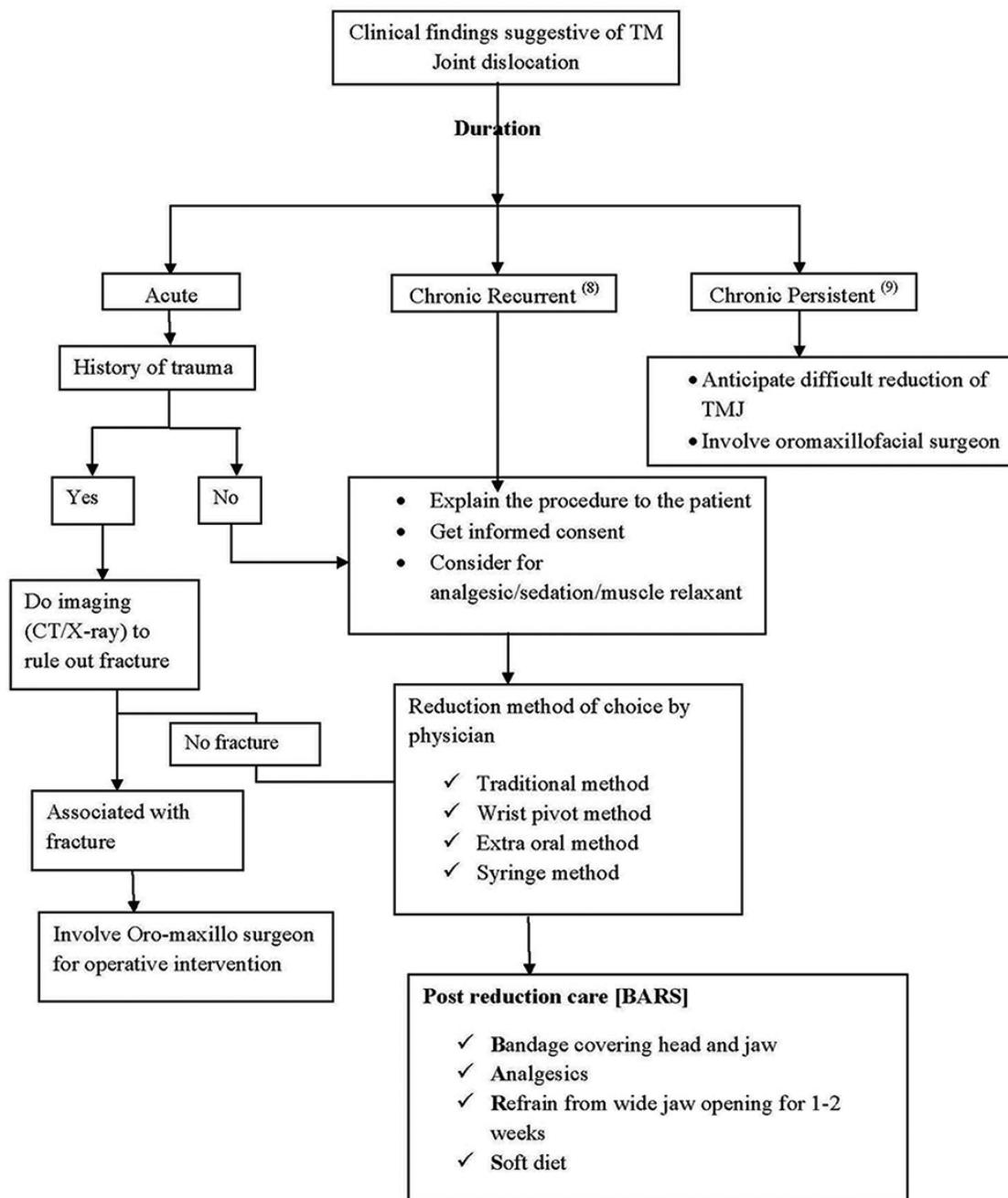


Figure 4: Protocol for managing TM joint dislocation in Emergency Department

of treatment for acute dislocations. Different methods available to reduce the TMJ dislocation are the conventional method, wrist pivot method, extraoral reduction technique, hands-off syringe technique, and gag reflex method.

### Conventional Method

In this method, the patient is placed in seated position (anterior approach) or supine (posterior approach). The physician, by applying bimanual intraoral force on the mandibular molars of the patient in an inferior and then posterior direction, will reduce the dislocated condyle back into the glenoid fossa [14].

### Wrist Pivot Method

The patient is placed in seated position. While facing the patient, the physician grasps the mandible with thumbs at the apex of the mentum and fingers on the occlusal surface of the inferior molars. The reduction is done by applying cephalad force with the thumbs and caudal pressure with the fingers and wrist acting as a pivot [5].

### Hands-off Syringe Technique

In this technique, the patient bites with their posterior molar teeth on a 5–10 cc syringe on the side of the dislocation. The syringe is rotated back and forth, so that it pushes the molar teeth posteriorly. The direction of rotation is clockwise for a right side dislocation or counterclockwise to the left [15].

### Gag Reflex Method

In 1987, Awang described induction of the gag reflex by probing the soft palate creates a reflex neuromuscular action that resulted in the reduction [16].

There is no risk of biting associated with the extraoral method of reduction, and also there is no significant difference in success rate between this and the conventional method. Hence, the extraoral method could be considered as the appropriate first-line treatment where there is a risk of patient biting the surgeon's hand during reduction. Given the overall benefits of the wrist pivot method, this method could be considered as the first-line and gold standard treatment modality in all other cases [14].

In case of chronic protracted dislocation, elastic rubber traction with arch bars and ligature wires/intermaxillary fixation with elastic bands are used to achieve the reduction [8]. However, chronic (prolonged) cases are more difficult to manage, possibly due to the development of fibrosis within the joint cavities, myospasm, bony union, or a combination of these. The surgical techniques adopted for prolonged cases were condylectomy, inverted L-shaped osteotomy, oblique ramus osteotomy, and vertical subglenoid osteotomy [10].

Usually, after reduction of dislocated TMJ, the patient is provided with a bandage around the face and jaw and is asked

not to open his/her mouth wide. However, the patient finds difficulty in eating and drinking due to the bandage, which further deteriorates the general health of the patient. Thus, the addition of a cervical collar to the geriatric population not only helps in the management of cervical spondylosis but also decreases recurrent mandibular dislocation by acting as a restrainer [17]. Each emergency department should have a protocol to manage TMJ dislocation. The flowchart shown below is our ED protocol for TMJ dislocation.

### Protocol for managing TM joint dislocation in Emergency Department [Fig. 4]

After confirming TMJ dislocation, the duration of dislocation should be considered. If its Acute, trauma related fracture of the mandible should be ruled out, if TMJ dislocation is associated with fracture, reduction attempt should not be attempted. Instead Oromaxillo surgeon should be involved. In case of Chronic recurrent and Acute dislocation with out fracture, manual reduction should attempted after explaining the procedure, adequate analgesics and muscle relaxants should be considered. In case of Chronic Persistent cases anticipate difficult reduction and involve Oromaxillo surgeon. Post reduction care should be given in all patients.

### CONCLUSION

The manual reduction is sufficient in cases of acute TMJ dislocation. The physicians should be familiar with different methods of manual reduction of an acute dislocated TMJ. A soft cervical collar can be advised to seizure disorder patients with TMJ dislocation to prevent recurrence. Chronic protracted and chronic recurrent dislocations are the most difficult to treat but can be managed conservatively with the help of experienced persons. Hence, the most important point to keep in mind is to identify the cause and treat them accordingly.

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