



Overview on the Prevalence, Risk Factors and Surgical Management of Temporomandibular Joint Dislocation: A Review Article

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Temporomandibular joint dislocations account for 3% of all recorded dislocations. Traumatic causes of mandibular dislocations may indicate some masculine taste, as facial trauma is more common among men. Frontal dislocations are the most common type of mandibular dislocations, usually secondary to non-traumatic causes. Magnetic resonance imaging is increasingly being used to investigate the condition of the articular disc to determine whether or not there is an internal defect in the temporomandibular joint. It is more cost-effective than cone-beam CT scans and is made available to many dentists. Management of temporomandibular joint dislocation should be provided promptly. Non-surgical treatment of temporomandibular disorders remains the most effective way to manage over 90% of patients. In relation to surgical management, acute anteromedial, medial, lateral, or posterior dislocations can be manually reduced under analgesic control, with local or general anesthesia, sedation or not, but other methods Used in the literature.

Keywords: *Mandible; jaw; dislocation; prevalence; management.*

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1. INTRODUCTION

The temporalis mandibular joint (TMJ) is an important joint that can perform all the functions of the hinge and gliding joint. The main ligaments that support the joints are the temporalis mandibular ligament, the Jophyeon mandibular ligament, and the Gwangjornand ligament. The blood supply to the joints is delivered primarily in the superficial temporal lobe of the external carotid artery. The joint receives sensory innervation from the mandibular branch of the trigeminal nerve (V3) via both nerves on the noble side of the masseteric nerve [1].

TMJ disorders can cause severe pain and dysfunction. A TMJ dislocation or mandibular dislocation is a displacement of either or both sides of the mandibular head from the articular surface of the temporal bone. TMJ dislocations can be anterior, posterior, superior, or external. Frontal dislocation is the most common type of mandibular dislocation, usually secondary to non-traumatic causes of excessive opening of the mandible or normal mouth opening. Bilateral dislocations occur more frequently than unilateral dislocations [2].

Temporomandibular joint dislocations account for 3% of all recorded dislocations [3]. Valesan et al 2021 [4] conducted a meta-analysis involving 21 prevalence studies and aimed to evaluate the prevalence of temporomandibular joint disease (TMJD) in the general population. The overall prevalence of TMJD is approximately 31% in adults/old people and 11% in children/juveniles, of which the most common TMJD was found to be intervertebral disc displacement accompanied by a decrease in adults/geriatrics (25.9%) and children/young adults. (7.4%).

TMJ dislocation can be classified as acute recurrent chronic. Acute dislocation is an isolated event and usually continues beyond facial trauma or opening of the mouth, such as yawning, laughter, singing, or seizures. It can also be caused by iatrogenic causes such as dental treatment or intubation [5]. Acute dislocations are usually treated with closed reduction (manually repositioned at once). The most common method is Hippocratic's repositioning, which places the doctor's finger next to the tooth and the other finger on the underside of the lower jaw. Then the doctor is putting pressure on the fins, then on the tail first. [6].

Chronic dislocations are dislocations lasting more than 3 days, but clear consensus does not

exist. This type of undamaged healing mandibular dislocation occurs. For shifts that exist for a long time, manual repositioning has no effect. I usually need my fixation [7].

Recurrent dislocation is a recurrent acute or chronic dislocation resulting from overmobility syndrome, articular fossa laxity, or hypermobility of the auxiliary joint to the shallow mandibular fossa [5]. Recurrent dislocations can be treated in a low-invasive manner, either by injection of botulinum toxin or by autologous therapy. If these methods are ineffective, surgery may be required. [6]

1.1 Study Objective

To quickly summarize the current evidence regarding the prevalence, risk factors, and modern surgical management of temporomandibular joint dislocation in Arabia.

2. EPIDEMIOLOGY

mandibular joint dislocation is generally not common and there is no general gender or age-related preference. The traumatic cause of mandibular dislocation can indicate some male preference, as facial trauma is more prevalent in men overall. Anterior dislocation is the most common type of mandibular dislocation and is generally secondary to traumatic causes. Posterior, lateral and upper dislocations are much less prevalent. Bilateral TMJ dislocations occur more frequently than unilateral dislocations. [1]

3. PATHOGENESIS

Dislocation of the TMJ is due to imbalance of nerve root function and structural defects. Changes in neuromuscular function result in relaxation of the articular discs and articular fossa ligaments, long-standing internal disorders, and spasm of the external wing ligaments. Structural deficits include changes in the arthrosis, namely flattening or stenosis, reduction in the height of the articular fossa, and morphological changes in the zygomatic arch and squamous cell division. [2,3] It also indicates an important role in age and tooth dislocation. [4,5] Other causes include dental treatment or endotracheal treatment, such as hyperfunctioning, yawning, laughing, vomiting, or strong mouth wide opening during seizures, third molars or root canals. Intubation, laryngoscopy and oral fiber optic bronchoscopy followed. [6,7] Certain medications can also cause dislocations.

Some syndromes are also associated with it as Ehlers-Danlos syndrome, Marfan syndrome and orofacial dystonia.

4. CLINICAL MANIFESTATIONS

There are three basic symptoms of temporomandibular disorders: jaw pain, joint noise, and limited jaw function. [8,9] Pain is the most common complaint and by far the more common problem [10]. However, the presence of joint noise is a fairly common finding in asymptomatic individuals in the general population, and in the absence of pain its clinical significance is of little importance. Jaw restriction includes a limited range of motion of the mandible in all directions. Like pain, jaw limitations cause a lot of anxiety for patients who have difficulty with daily activities such as eating and speaking [10,11]. Patients may describe their restricted jaw opening as being caused by a generalized sensation of tension (which is likely to be a muscle disorder) or a sudden sensation of jaw "catching" or "stuck", often associated with disturbance of the inner disc of the joint.

Headache, earache, tinnitus, and neck and shoulder pain are just a few of the many nonspecific symptoms commonly reported in patients with temporomandibular disorders; however, these symptoms are not considered specific diagnoses for temporomandibular joint disorders.

5. DIAGNOSIS

Primarily by physical examination, but investigation is needed not only to rule out the possibility of other pathological processes that may mimic the symptoms of TMJ disorder [12], but also to see if there is a specific ATM-related illness.

6. PHYSICAL EXAMINATION

Patients should be evaluated for palpable head and neck pain. Palpation is done by placing fingertips in the preauricular region, in front of the trachea of the ear. The patient is then invited to open the mouth and the fingertip will then fall into the depression left by the drain. Pain that is localized especially in the preauricular region is a worthy sign of a real rheumatic disease. Digital palpation can also be used to examine the masticatory muscles.

Joint sounds and their position during opening, closing, and lateral excursions of the mandible

can be palpated or detected using a stethoscope placed over the preauricular region. Blinking is a reliable indication of internal alignment while squeaking / crepitus is a sign of advanced degenerative joint disease such as osteoarthritis.

Mandibular function can be assessed by noting whether the longitudinal opening is straight and smooth or deflected with jerky movements, indicating joint disease [13]. The maximum painless vertical opening range (normal range is 40-55mm inter-articular space) should be documented. Any opening less than 40mm is considered restrictive and any opening less than 30mm requires urgent attention and referral.

7. DIFFERENTIAL DIAGNOSIS

Other possible causes should be looked for and excluded, such as toothaches, ear, nose and sinus disorders, neuralgia, headaches and major diseases of the salivary glands, which can all look like symptoms of temporomandibular joint pain and dysfunction [14]. Mandibular fractures and drain fractures are important for early identification; They can occur in conjunction with mandibular dislocations. In patients with dislocations secondary to trauma, x-rays should be taken to assess the condition of the fracture. Infections that may look like a dislocation of the TMJ may include oropharyngeal abscess, epiglottitis, or peritonsillar abscess. These infectious manifestations may have clinical features similar to mandibular dislocations, including trismus, drooling, and sore throat or neck. It is important to assess the oropharynx and establish an appropriate patient history, as the treatment for infection and dislocation varies widely. TMJ dysfunction or acute locking of the TMJ meniscus and dyskinesia such as tetanus may be confused with dislocation because the patient will not be able to open the mouth normally. History, physical examination, and imaging are important in characterizing individual mandibular dislocations.

8. INVESTIGATION

Recently, magnetic resonance imaging has been increasingly used in the investigation of disc disorders to determine if there is a disorder within the temporomandibular joint, and Conebeam CT is increasingly used. become cost effective and accessible to many dentists. and is extremely useful for rendering high-resolution multi-plane images of the duct tip, clearly showing the

presence of ductal pathology such as osteoarthritis.

9. MANAGEMENT

Management of TMJ dislocation should be done promptly. Non-surgical treatment of temporomandibular disorders remains the most effective management in more than 90% of patients. There are many non-surgical treatments for TMJ disorders including: patient education and personal care, drug therapy, Bolt therapy, physical therapy, other therapies (acupuncture) research, injections of Botox, [15] Orthopedics / osteoarthritis and other treatments have been tested in the management of TMD but have not yet been established in current practice due to the lack of evidence on the effectiveness of these modalities. This method.

The authors classified dislocations according to the relationship between the mandibular nerve head and the buoyancy of the joint seen on the x-ray. assessment in three distinct categories [16]:

Type I - when the head of the condyle is directly below the tip of the condyle

Type II - when the head of the condyle is in front of the head of type

Type III - when the head of the condyle is above the base of the sharp appearance.

Acute anterior, medial, lateral or posterior dislocations can be managed manually under local or general anesthesia, with analgesia with or without sedation. Other methods that have been used in the literature include the wrist rotation technique. [17], combined technique laterally shifted [18], complementary oral technique [19], a gag reflex procedure in which the soft palate is rubbed over a dental probe to initiate relaxation of the lateral pterygium and spontaneous contraction and closure of the mouth. However, Hippocratic manipulation still has the highest success rate.

Acute or chronic dislocations are treated with slit angioplasty, the end of the duct embedded in the middle cranial fossa must be kept in place to prevent bleeding, cerebrospinal fluid leakage and infection [20,21] .

Circumcision is performed in case of prolonged lateral dislocation (complete / extraction) type II, while early treatment of class I and type II is performed by closed reduction of the dislocation and fracture of the jaw below involved, and

interstitial fixation with arches, ligatures, and stainless steel wire ties for approximately 46 weeks [22]. In the presence of a bilateral drainage canal fracture, reduced opening and internal fixation of the indicated canal segment plus fixation between the canal with an elastic band for 24 weeks [23].

The recurrence rate after the initial dislocation is 22 according to the literature [3]. Minimally invasive techniques (botulinum toxin injection, autologous blood injection, prolotherapy) for the treatment of recurrent TMJ dislocations are mainly indicated in patients with reduced compliance or an increased risk of surgery [24]. However, the treatment of recurrent TMJ dislocation with botulinum toxin is considered off-label use. In addition, long-term results are often unsatisfactory, and ultimately invasive surgical management is required [25,26].

For prolonged chronic dislocation, it is usually in the suggested type III position, the Hippocratic method is often unsuccessful without general anesthesia and muscle relaxants and even with this the failure rate is significantly high. Conservative methods such as elastic rubber traction with arch and splint / IMF with elastic band are helpful in reducing prolonged chronic dislocation. Before the use of elastic bands, acrylic blocks or impression pads can be placed between the upper and lower teeth to lower the jaw and open the posterior occlusal part, which helps to move the occlusal downwards, the elastic band applied back and forth help push / lead into hole after removing tampon for about 71 hours. up to 1 week. Extrusion of the tooth was reported and corrected with the occlusion plane.

Bone hooks have also been used to apply traction through the sigmoid groove. Wire traction can also be achieved through holes drilled at the angle of the device [27].

Manual relief under local anesthesia/temporal and deep nerve blocks [28], awake sedation, and general anesthesia have also been described and should be performed first, but most Usually, surgical procedures are used.

10. COMPLICATIONS

Recurrent and chronic dislocations may occur. In addition, recurrent dislocations can damage ligaments and the joint capsule and lead to degenerative joint disease. The outer ear tube can be damaged by dislocation both posteriorly and superiorly and can cause deafness. Nerve

damage can occur in the facial nerve (CN VII) or the cochlear nerve (CN VIII). Vascular damage can lead to damage to the external carotid artery or to traumatic brain injury.

Iatrogenic complications can also occur after reduction. Fracture can occur due to the effect of force acting on the shaft mechanism. Ligament damage or nerve breakage can result from forced manipulation. Botulinum toxin should be avoided in people who are allergic to botulinum toxin and myasthenia gravis [29].

11. CONCLUSION

Temporomandibular joint dislocation account for 3% of all documented dislocations. Traumatic causes of mandibular dislocation may show a slight male predilection as facial trauma is more prevalent overall in men. Anterior dislocations are the commonest type of mandibular dislocation, usually secondary to atraumatic causes. Magnetic resonance imaging has increasingly been used in the investigation of the status of the articular disc to determine if there is internal derangement of the temporomandibular joint, Cone-beam CT-scans are becoming more cost effective and accessible to many dental practitioners. Management of TMJ dislocation, whether medical or surgical, must be provided promptly.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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