Anterior dislocation of the temporomandibular joint: a simplified non-traumatic manual technique

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ABSTRACT

Anterior mandibular dislocation (AMD) is defined as the displacement of the condylar head out of the glenoid fossa beyond the articular eminence, and that does not reduce spontaneously to its normal position. The Hippocratic method is the usual approach for condylar repositioning at most health centers although it is perceived by the patient as an unpleasant, brusque technique and outcomes are not always favorable.

Objective: The aim of this work is to describe a new simplified nontraumatic manual technique and its application in a series of cases.

Method: A procedure based on gently and constantly guiding the patient's mouth opening and closing movements is described in detail.

Results: Forty-two patients were treated with a treatment success rate of 100%, and no pain associated with the procedure. Procedure time was 1.5–7 min in 40 of the 42 treated cases.

Conclusion: The procedure presented here is an improvement on the original technique: it is simple, fast, effective, can be performed in any setting, and avoids use of brusque force, which is the factor that causes the patient most discomfort and fear.

KEYWORDS

Mandibular Condyle;
Temporomandibular
Disorders; Joint Disease; TMJ
Disorders; Recurrence;
Temporomandibular joint;
dislocations; therapeutic
procedure

Introduction

Temporomandibular joint dislocation is a displacement of the condylar head out of the glenoid fossa beyond the articular eminence, and that does not reduce spontaneously. It accounts for 3% of all reported dislocated joints in the body [1] and occurs more frequently in women [2,3] in their second and third decades of life [4,5]. It can be classified based on symmetry (uni- or bilateral), position of the mandibular condyle (anterior, posterior, medial, lateral, or superior), number of occurrences (recurrent or non-recurrent), time of presentation (acute or chronic), and etiology (traumatic or spontaneous [6]. Spontaneous acute bilateral anterior mandibular dislocation (AMD) is the most frequent type [2,6–9].

Everyday situations such as yawning, laughing, extreme mouth opening, dental procedures, vomiting, and oral sex, can trigger anterior dislocation of the mandibular condyle in patients with predisposing factors [2]. Morphological bone alterations of the mandibular condyle or articular eminence of the temporal bone, capsule laxity, ligamentous laxity, or muscle hyperactivity are predisposing factors for dislocation [8].

Patients with AMD present at emergency wards with mandibular prognathism, inability to close the mouth, difficulties with speech, palpable preauricular depression with intense joint pain, and occasionally with an increase in saliva production. When dislocation is unilateral, the

mandible will present a lateral deviation toward the opposite side [2,10].

The Hippocratic bimanual intraoral method (fifth century B.C.), with or without anesthesia and/or sedation, is usually used at most health centers to reposition the condyles into the glenoid cavity [2,8,9,11]. The maneuver consists of applying downward force to the mandible to allow the condyles to clear the articular eminence, and then re-seat the condyles within the glenoid fossa. Although this maneuver is effective, it is perceived by the patients as traumatic. Forceful stretching of the muscle triggers a myotatic reflex, which results in sudden closure of the mouth, and may cause injury to the operator's thumbs. If manual reduction using the Hippocratic method fails at the first attempt, further attempts are likely to be unsuccessful since the perception of pain associated with the maneuver triggers protective emotions such as fear. As a result, the patient tenses the muscles in anticipation of discomfort and pain, and it becomes very difficult to perform the procedure.

With the aim to achieve maximum effectiveness with minimum patient discomfort, several variants of the original technique, including the use of devices [12–14], and of some type of pharmacological agent have been suggested [10,15,16]. The use of general anesthesia [8,11], traction [8,17,18] and even surgery has been proposed to manage complex cases [11].

Although the majority of the proposed innovations are shown as effective techniques, the reported results correspond to individual case reports or case series including few patients. In addition, treatment options for complex cases tend to be aggressive, costly, and require the intervention of experts who are not always available at the emergency services.

The aim of the present study was to report a new technique for the reduction of anterior mandibular dislocation. We developed a methodology involving exertion of gentle, steady pressure that is well tolerated by the patients and has proven highly successful.

Methods

During the 2011–2018 period, a total 394,000 patients received oral care at the School of Dentistry of the University of Buenos Aires. Forty-five of these patients were cases of temporomandibular joint dislocation (TMJD) and were treated at the Emergency Service. The present study comprised 42 cases of male and female patients with acute and chronic anterior TMJD. Cases of trauma-related TMJD were excluded. To a greater or lesser degree, all the patients showed the usual signs and symptoms described above; the most frequent and overt were mandibular prognathism and inability to close the mouth (Figure 1). All the patients were treated using the technique developed by our team. The procedures were approved by the Ethics Committee of the University

Figure 1. Prognathism and inability to close the mouth in a patient with anterior mandibular dislocation.

(Resolution number 026/2011) and conducted in compliance with the Declaration of Helsinki. Informed consent was obtained from all patients.

Reduction technique

With the patient in a sitting position, the emergency physician (EP) stands in front of the patient, and places his/her thumbs behind the last lower molars, not on the occlusal surface in order to avoid the patient biting down on the operator's fingers. In this position, the operator exerts gentle and steady pressure in a downward and posterior direction (at a 45° angle). The correct position of the thumbs is shown in Figure 2. The procedure lasts 1–2 min, during which the EP must talk to the patient ensuring him/her that no brusque maneuver will be performed at any time. At no time should there be a change in the intensity or direction of the pressure, for this would be perceived by the patient as a warning signal, and would induce muscle contraction and make reduction more difficult. Without releasing the pressure, the patient is then instructed to perform opening and closing mouth movements (up to 5 times), followed by lateral jaw movements (up to 5 times). This is the most important step in the procedure. The gentle, steady pressure allows the patient to perform ample jaw movements with no pain. The dynamics of these movements while the elevator muscles are relaxed induce natural repositioning of the condyles[19]. If mandibular condyle repositioning is not achieved during this procedure, the cycle of movements is repeated once more. If reduction is still not achieved, the patient is allowed to rest for about 1 min, after which the maneuver is repeated.

In cases of unilateral dislocation, the thumbs are also placed on both sides, but the pressure is exerted on the side of the dislocation only.

In all the cases included in the present study, a single EP performed the manual reduction maneuver in outpatients without using procedural sedation, or local or general anesthesia. The time required to achieve repositioning of the condyles in the glenoid

Figure 2. (a) Correct position of the operator's hands. (b) The thumbs are placed behind the last molar.

Table 1. Clinical features.

Gender N (%)		Age		Join involved N (%)		Evolution N (%)	
F	M	Range	$X \pm SD$	Bilateral	Unilateral	Acute	Chronic recurrent
33					(79%)	9 (21)	(%)
21-95	45.36			23.80	37 (88%)	5	(12%)
	$\pm$				(63%)	16	(37%)
26							

fosae the number of times the procedure had to be repeated, and subjective perception of pain (mild, moderate, or severe) were recorded.

Treatment success was defined as full repositioning of the condyle in the glenoid cavity.

Results

The studied sample comprising 42 patients had a wide age range and included a similar number of male and female patients. The patients' clinical features are shown in Table 1. Twenty-three (23) of the 42 patients were referred from other emergency services where manual reduction had failed, so that the patient had undergone more than one attempt at reduction. Duration of dislocation was less than 1 h in patients presenting directly at our service, and up to 3 h in those referred from other services. Condylar reduction using the method described here was successful in 100% of the patients. The time required for reduction was 1.5–7 min in 40 of the 42 studied cases. In 12 cases, the entire procedure had to be repeated up to 3 times (i.e. with two 1-min rest periods between attempts). A maximum of 15 min and up to six repetitions were required in the remaining two patients. Both these patients were referred from other centers and suffered the dislocation for 2 and 3 h, respectively.

Despite all reductions being performed without anesthetics or sedatives, they were tolerated well by the patients, who reported having no pain during the maneuver.

Discussion

Anterior TMJD leads patients to present at medical and dental emergency services in search of help. Besides the typical prognathism and difficulty opening and closing the mouth, the patients often have pain and marked anxiety due to difficulties speaking and communicating. When faced with a condition in which anxiety is the major treatment obstacle, the practitioner must choose the simplest, fastest, most effective, and safest method that will cause the least discomfort to the patient.

The Hippocratic bimanual intraoral technique is still the most common method in view of its simplicity, effectiveness, and success rate above 85% [18,20].

Nevertheless, it poses disadvantages in that the force applied is unpleasant for the patient, and that the practitioner is at risk of injury as sudden masseter spasm may result in the patient biting down on the operator's thumbs. Modifications to the traditional technique [6,8,10,12–17,21], often increase the complexity of the traditional approach. Increasing the complexity of a procedure that has been proven effective is justified on the grounds that the innovation entails benefits to the patient, the operator, and/or is less time-consuming and more cost-effective. Simplifying a procedure, on the other hand, is always beneficial provided that the simplified technique is more effective than, or as effective as, the original method.

Since it was first applied, we have found the present procedure developed by our team to be simpler safer, and more comfortable for the patient than the traditional methods. Hence, it has been the method of choice in all emergency cases presenting at our service. We herein report the results obtained in a series of 42 cases. To our knowledge, the present series is the largest reported in the literature to date. In our experience, the method had a 100% success rate. Studies published in the literature, which also describe different techniques but do not include statistical comparisons, report isolated cases or series of 7 to 20 cases of anterior spontaneous dislocations achieving different successful outcomes [6,11,12].

As regards the time required to achieve repositioning in the condyle, it is difficult to compare the findings of the different reports, with results ranging from 'few seconds' to 10 min [12–16,19]. The times recorded in the present series are within those values. Although this gentle maneuver decreases the risk of sudden closure of the mouth as a result of a myotatic reflex, the procedure also involves placing the thumbs behind the last lower molars thus preventing injury to the operator.

Further studies are needed to scientifically assess the effectiveness of the procedure presented. The lack of a group of patients treated with the most common technique used until now which could be used as a control group is a limitation of this report. The lack of precise data in the literature makes a statistical comparison difficult, so it would be necessary to conduct clinical trials to evaluate indicators of success such as complete reduction, time spent, measurement of the applied force and intensity of pain, in test and control groups. These endpoints should be measured under different clinical dislocation conditions. Publication of results obtained using different techniques, at different health-care centers, by different health professionals with different backgrounds, and accurately reporting the different variables associated with the expected success, would also allow performing a meta-analysis to scientifically establish the advantages and disadvantages to each of the techniques.

Having the patient perform jaw movements while exerting gentle steady pressure, and after gaining the patient's trust and achieving muscle relaxation, is the main innovation of our technique. This maneuver achieves a painless reduction which in principle is an important advantage over current techniques.

Acknowledgments

The authors wish to thank Dr María E. Itoiz, Emeritus Professor of the University of Buenos Aires, for critically reading the manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

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