SHORT COMMUNICATION

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THE MODIFIED WRIST PIVOT METHOD, A NOVEL TECHNIQUE FOR TEMPOROMANDIBULAR JOINT REDUCTION: TRIVANDRUM TECHNIQUE

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ABSTRACT:

Dislocation of the temporomandibular joint (TMJ) is a common problem , usually spontaneous, and may result from excess mouth opening as in the case of yawning, laughing, taking a large bite, seizure, or during intraoral procedures such as tooth extraction or orotracheal intubation and needs to be addressed immediately so as to relieve acute pain and discomfort. The dislocation of TMJ may be acute or chronic. Acute TMJ dislocation is common in clinical practice and can be managed with manual reduction by hippocrate method, but this maneuver needs a lot of effort by the physician , with or without local anaesthesia and/or sedation. Patient cooperation is needed and there is risk of being bitten, with consequent disease transmission. The method used by us was our modification of wrist pivot technique (L. E. Lowery et al 2004). "Modified wrist pivot tecnique", an intraoral approach, uses patient cooperation, and intentional cough reflex, along with intrinsic biomechanical properties of the mandible for reduction.

Key-words: Dislocation , Hippocrate method, Intentional cough reflex, intraoral approach , pivot technique, Temporomandibular joint

INTRODUCTION

The temporomandibular joints allow opening and closing of the 'mouth' and complex 'chewing' or 'side-to-side' movements of the lower jaw.[2] The condyle of the mandible articulates bilaterally in a concavity known as the glenoid fossa or the mandibular fossa. The biomechanics of the TMJ is under neuromuscular control, comprising the muscles of mastication, the ligaments associated with it, and neural transmission carried by the mandibular division of the trigeminal nerve (Fig 1) . Dislocation of the TMJ is due to either imbalance in the neuromuscular function or structural deficit. Alteration in the neuromuscular function occurs due to laxity of the articular disc and the capsular ligament, longstanding internal derangement, and spasm of the lateral pterygoid muscles. Structural deficit involves arthritic changes in the condyle, i.e., flattening or narrowing, decrease in the height of the articular eminence, morphological changes of the glenoid fossa, zygomatic arch, and squamotympanic fissure.[3,4] The most common type of temporomandibular joint (TMJ) dislocation is acute episodes of anterior dislocation, although dislocations may occur in any direction such as medial, lateral, superior into the middle cranial fossa, and posterior. [5,6,7] The traditional intraoral (Hippocratic method) reduction method, although effective, has some disadvantages as it

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requires a great effort, especially in patients with strong masticatory musculature.[5] The manual reduction method is performed by first pressing the mandible downward, then backward, and finally upward as described by Hippocrates. In 1981, Lewis modified it by stating that the patient should be made to sit down and the clinician should stand in front of him/her or at 11o' clock position. Then, the thumb should be pressed down on the occlusal surface of the lower molar teeth. At the same time, the chin should be elevated with the fingers and the entire mandible should be pushed posteriorly [8]

TRIVANDRUM TECHNIQUE

GOVERNMENT DENTAL COLLEGE, TRIVANDRUM is a tertiary center in trivandrum, kerala . Patients reffered to the Oral and maxillofacial surgery OPD were included consecutively in this prospective trail in an 4-month period (Feburary–August 2016). A thorough history was taken regarding demographic information, past history of TMJ dislocation, underlying disorders, trauma, prior use of muscle relaxing agents, and time delay between dislocation and reduction. Mandibular fractures, especially those involving the condylar and subcondylar region were ruled out by physical examination and radiological examination. To reduce TMJ dislocation, the patient was put in sitting position and the operator stood in front of the patient. An attempt was made to reduce the dislocation using the new method. Successful treatment was recorded when reduction was obtained at first try.

To reduce TMJ dislocation, the patient was put in sitting position and the operator stood in front of the patient . While facing the patient, the mandible was grasped with the physician's thumbs at the apex of the mentum and fingers on the occlusal surface of the mandibular molars.(Fig 2) . By applying cephalad force with the thumbs and caudad pressure with the fingers, then pivoting at the wrists simultaneously, ask the patient to cough 3-4 times intentionally. As the patient starts coughing apply steady pressure over the occlusal surface of mandibular molars inferiorly and lift the chin superiorly. The mandible is rotated by this maneuver with minimal effort by the operator and the dislocated TMJ is usually reduced in a short interval of time. After achieving successful reduction give craniomandibular support with crepe bandage The patient is subsequently discharged in good condition.

RESULTS:

Among 10 attempts with newer method , 8 were successful, with time taken for reduction in range of 2-6 minutes.

DISCUSSION AND CONCLUSION:

The TMJ is a ginglymoarthrodial joint, combining gliding and hinge motions. Dislocation can occur anteriorly, posteriorly, laterally or superiorly. Our discussion will be limited to anterior dislocation, as it occurs most commonly, and without a fracture.[8] TMJ dislocation

occurs when there is an interruption in the normal sequence of muscle action during closure from maximal opening. Interruption allows elevation of the mandible before retraction. This occurs when the protracting lateral pterygoid muscles fail to relax before the masseter and temporalis muscles elevate the mandible.[9] The condyle travels anteriorly along the eminence and becomes locked in the anterior superior aspect of the eminence . The masseter, pterygoid, and temporalis muscles go into spasm on attempting to close the mandible and the condyle cannot return to the temporal fossa[1] . Muscle spasm and edema result in significant pain to the patient.

Potential causes of TMJ dislocation include any action that may involve the mouth being maximally open. Common causes include yawning, brushing and trying to chew a large bolus of food. The literature has noted TMJ dislocation as a complication of anesthetic induction, intravenous sedation, Ehlers-Danlos Syndrome, trauma and even tetanus. [3,4,8-12] The complications of TMJ dislocation include recurrent subluxation/dislocation from injury to the articulating cartilage, as well as fracture.[13]

The prognosis is usually excellent, although recurrent TMJ subluxation/dislocation may require surgical treatment.[14,15] Diagnosis may be made clinically if the following features are present. The patient will present with inability to close the mouth, severe pain anterior to the ears, absence of the condyle from the glenoid fossa resulting in a visible, palpable pre-auricular depression and a prominent-appearing lower jaw[16] If dislocation is unilateral, the jaw deviates away from the involved side.[17]If trauma is involved, radiographic analysis is needed for the evaluation of possible fracture. Conventional techniques as described by standard Emergency Medicine textbooks describe the physician placing his protected thumbs on the occlusal surface of the patient's molars, wrapping his fingers laterally around the mandible and then applying a constant inferior and posterior force, gliding the mandibular condyles back into the glenoid fossa. The conventional reduction technique requires the operator to manually overcome the substantial force created by the pterygoid, masseter and temporalis muscles to achieve reduction . In the modified pivot technique we describe, these forces are utilized to assist with reduction . A method via intraoral route for reduction of dislocated TMJ is presented - the mandible was grasped with the physician's thumbs at the apex of the mentum and fingers on the occlusal surface of the mandibular molars. By applying cephalad force with the thumbs and caudad pressure with the fingers, then pivoting at the wrists simultaneously, insist on the patient to cough 3-4 times intentionally. As the patient starts coughing, apply steady pressure over occlusal surface of mandibular molars inferiorly and lift the chin superiorly. The mandible is rotated by this maneuver with minimal effort by operator and the dislocated TMJ is

usually reduced in short time interval of time It is important to note that these forces must be applied bilaterally to prevent mandibular fracture. The muscles of mastication provide assistance rather than impedance with this noval technique for reduction of dislocated TMJ.

We advocate the use of this technique for ease of reduction of the dislocated TMJ.

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FIGURES:

Figure 1: Wrist pivot method

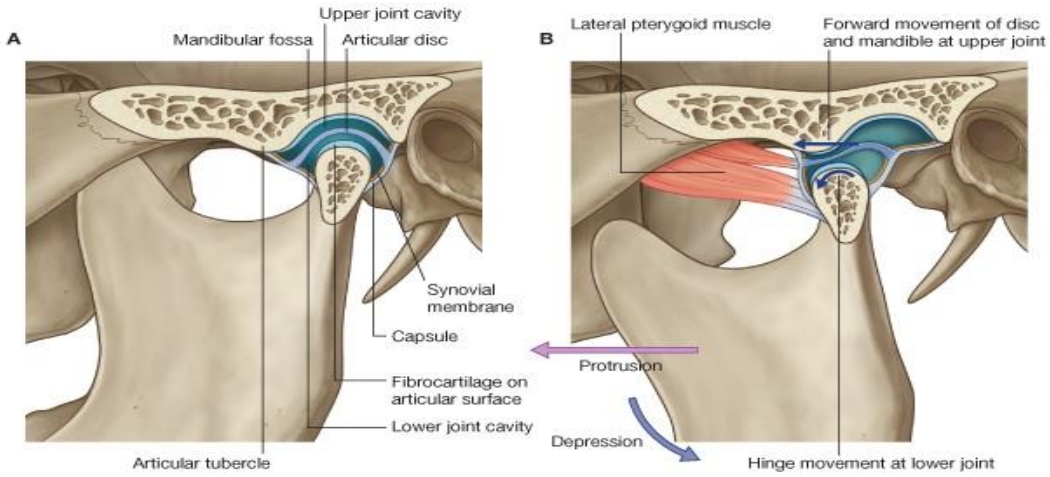

Figure 2: Temporomandibular joint. **A.** Mouth closed. **B.** Mouth open

Figure 3: panogram showing bilateral TMJ dislocation