Frontiers in Dentistry

Single Injection of Twin Nerve Block in Longstanding Unilateral Temporomandibular Joint Dislocation: A Novel Technique

Neeraj Kumar[1]*, Richa Kumari[2]

1. Department of Pediatric Dentistry, Postgraduate Institute of Child Health, Noida, Uttar Pradesh, India
2. Postgraduate Institute of Dental Sciences, Rohtak, Haryana, India

Article Info

Article type:
Case Report

Article History:
Received: 25 Jun 2024
Accepted: 15 Jan 2025
Published: 22 Jul 2025

**** Corresponding author:***
Department of Pediatric Dentistry, Postgraduate Institute of Child Health, Noida, Uttar Pradesh, India

Email: dr.neeraj001@gmail.com

A B S T R A C T

Unilateral temporomandibular joint (TMJ) dislocation is a rare condition often triggered by yawning, vomiting, or other activities involving wide opening of the mouth, resulting from the forward movement of the condylar head. This case report highlights a longstanding unilateral TMJ dislocation managed by the single injection of local anesthetics into the deep temporal and masseteric nerve peripheries, alleviating muscle spasm and pain to restore TMJ function.

Keywords: Temporomandibular Joint; Mandibular Nerve ; Nerve Block; Joint Dislocations

➢ **Cite this article as:** Kumar N, Kumari R. Single Injection of Twin Nerve Block in Longstanding Unilateral Temporomandibular Joint Dislocation: A Novel Technique. *Front Dent.* 2025:22:27. http://doi.org/10.18502/fid.v22i27.19204

INTRODUCTION

Temporomandibular joint (TMJ) dislocation is the forward displacement of the mandibular condylar head towards the articular eminence, preventing its relocation into the glenoid fossa [1]. TMJ dislocation is a rare condition that occurs while yawning, vomiting, or any sort of wide opening of the mouth. Any dislocation that is present for more than a month is called a longstanding dislocation [1]. However, recently, an acute dislocation that is either left untreated or inadequately treated for more than 72 hours is considered a longstanding dislocation [2]. TMJ dislocation represents 3% of all the dislocated joints in the body and may be unilateral or bilateral. It can occur in anterior, posterior, medial, superior, or lateral directions, with anterior dislocation being the most common [3]. There are two factors that hamper the reduction of TMJ dislocation: muscle spasms and pain in the joint capsule. Elevator muscular spasm provides resistance to manipulation of the condylar head and pain around the joint capsule. In longstanding TMJ dislocation, spasticity and pain of the elevator muscles occur, making the dislocation difficult to reposition [4]. There are various methods to counteract the spasms and pain of the elevator muscles. The commonly used methods are manual reduction, the use of muscle relaxants, sedatives to reduce spasms, and injection of local anesthetic solution around the joint capsule which only decreases the joint pain

and not the muscle spasm/pain. A patient may be treated under general anesthesia to allow manual reduction, temporal myotomy, or midline mandibulectomy in refractory cases [5,6].

This case report describes a single injection technique in which deep temporal and masseteric nerves were anesthetized for the reduction of TMJ dislocation. These nerve blocks help in reducing both muscle pain and spasms quickly and efficiently, thereby omitting the need for surgical correction. The longer the time elapses since the dislocation, the more difficult the reduction may be due to longstanding pain and muscle spasms.

CASE PRESENTATION

A 25-year-old female patient presented with a chief complaint of inability to close her mouth properly and swelling on the left side of the jaw for 15 days. She also had a history of pain and tenderness on the left side of the mandible. She went to a local clinic where an oral examination was performed. The practitioner diagnosed the left mandibular molar as carious and prescribed antibiotics and analgesics. However, the TMJ dislocation remained unnoticed. After 15 days, the patient came to the Dentistry Department where a complete history was recorded. The history revealed the patient had an episode of vomiting and after that, the patient's mouth remained open. Extraoral examination revealed an asymmetrical face, and the mandible deviated to the right side during closure (Figure 1). There was tenderness and pain on the left side of the masticatory muscles. Oral examination revealed an open bite on the right side. An orthopantomogram (OPG) was performed to evaluate our clinical findings and revealed displacement of the left condylar head beyond the articular eminence (Figure 2). Additional findings included a carious lesion with periapical pathology on tooth 36 and a carious lesion on tooth 46. A diagnosis of unilateral TMJ dislocation was made, and an attempt at manual reduction was performed. The patient was seated on a dental chair with proper back and head support to facilitate the procedure. A sterile gauze was wrapped around the thumb and a downward and backward pressure was applied to clear the articular eminence.

Fig 1. Preoperative extraoral image of left side unilateral TMJ dislocation

Fig 2. Preoperative Orthopantomograph of the patient showing mandibular condylar head in front of the articulate eminence

The patient experienced severe pain during the procedure and the mandible could not be repositioned due to longstanding muscle spasm. Consequently, it was decided to administer a twin nerve block to alleviate the spasm and pain of the elevator muscles.

Single injection technique of twin or peripheral nerve blocks

This injection is an extraoral technique in which the masseteric and anterior deep temporal nerves are blocked with only a single injection. These peripheral nerves are branches of the trigeminal nerve's mandibular division (V3), which emerges from the infra-temporal fossa at the infra-temporal crest. Upon exit from the infra-temporal fossa, the anterior deep temporal nerve

innervates the temporalis muscle superiorly and the masseteric nerve innervates the masseter muscle inferior-anteriorly after traversing the temporal fossa toward the neck of the mandibular condyle and crossing the mandibular notch (Figure 3).

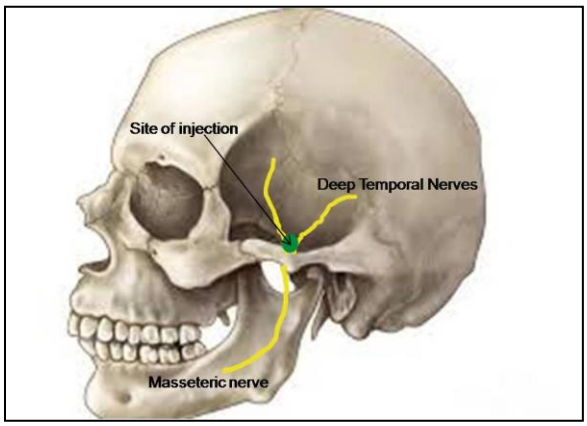

Fig 3. Skull diagram showing deep temporal nerves, masseteric nerves, and the site of injection

Anatomical Landmarks and Technique

The site of injection was scrubbed with 5% povidone-iodine solution, after which an extraoral approach was used to target the temporal fossa medial to the superior border of the zygomatic process. The surface landmark for the needle entry was the palpable depression overlying the greater wing of the sphenoid and temporalis muscle, located just superior to the zygomatic process, and posterior to the zygomatic process of the frontal bone. The needle was directed medially at an angle of 30º to the long axis and taken to a depth of an approximately 1.5 inches. Aspiration was performed before depositing the anesthetic solution [7] (Figure 4).

After 5-10 minutes, pressure was applied to the mandible with the fingers and thumb pointed in a downward and posterior direction. Due to the peripheral nerve block, muscle spasm and pain was reduced significantly, allowing a relatively quick reduction. Post-operative OPG was obtained to check the position of the mandibular condyle (Figure 5). The patient was instructed not to open the mouth wide while eating, or yawning, and support the mandible from the chin region for one week. Barton's bandage was tied with the gauge to limit mouth and jaw opening (Figure 6).

Fig 4. Extraoral twin nerve block to counteract the pain and spasm allowing easy reduction of the temporomandibular joint dislocation

Fig 5. Orthopantomograph after reduction of the unilateral temporomandibular joint dislocation showing the normal position of the condylar head in the glenoid fossa

Fig 6. Barton bandage given to the patient to restrict the movement of the temporomandibular joint

DISCUSSION

The partial/incomplete displacement of the condylar head in an anterior direction and out of the glenoid fossa is termed as subluxation. TMJ dislocation is more commonly seen in patients with general joint laxity, internal derangement of the disc, or those who are associated with vertical dimension disturbances, neurologic diseases with increased muscular activity, and patients under neuroleptic therapy with extrapyramidal symptoms [3,8]. TMJ dislocation can be classified as anterior, posterior, medial and lateral based on position, unilateral or bilateral based on symmetry, acute or chronic based on time of presentation, traumatic or non-traumatic based on etiology, and recurrent or non-recurrent based on occurrence [9]. Non-traumatic dislocation includes laughing, yawning and convulsions. In addition, anatomical variations like articular eminence morphology, poor joint capsule integrity, and hypotonicity of the muscles are various predisposing factors [10]. TMJ dislocation is often diagnosed by clinical signs and symptoms. Various clinical signs include inability to occlude the teeth, mandibular pain, drooling of saliva, a prominent mandibular head anteriorly and pre-auricular depressions, and deviation of the mandible to the opposite side [11]. Radiological examination using OPG can be a useful aid to confirm the diagnosis of TMJ dislocation.

Acute TMJ dislocation requires immediate reduction in an emergency setting. As time elapses or in longstanding cases, spasms of both pterygoid and masseter muscle worsen, therefore reduction becomes more difficult [12]. Other methods like asking the patient to open the mouth against resistance, and use of sedatives or muscle relaxants are also used to counter the spasm of the elevator muscles. Carido-respiratory monitoring is required when sedatives are used intravenously. Muscle relaxants may take up to one hour to be effective but it is difficult for the patient to swallow a tablet in case of TMJ dislocation [4,12,13]. Manual reduction of TMJ dislocation was initially documented by Hippocrates. Subsequently, Yurino in 1983 also proposed alternative method for reduction of TMJ dislocation [14,15]. The common method used to reduce the anterior dislocation of the TMJ involves placing fingers on both mandibular molars after wrapping a bandage on both thumbs to prevent biting. Pressure is applied between the molars in the downward direction while elevating the angle of the mandible with fingers and pushing the mandible in a backward and upward direction. The muscular spasm and pain of the elevator muscles are two major inhibiting factors that oppose the reduction. In long-standing cases, the spasm and pain increase with time, which makes the reduction more difficult [12].

Huang et al. [2] classified longstanding TMJ dislocations and treatment strategies according to their duration. A close reduction was suggested in cases with less than 3 weeks of TMJ dislocation. In TMJ dislocations lasting 1 to 6 months, open reduction with the use of traction wires, retractors, and wide sub-periosteal dissection was recommended. In TMJ dislocations longer than 6 months, additional techniques including condylotomy, condylectomy, myotomy, and arthroplasty may be required [2].

In individuals with chronic recurrent dislocations, various surgical techniques like partial or complete myotomy, open condylotomy, scarification of the temporalis tendon, capsular plication, down fracture of zygomatic arches, insertion of implants into the articular eminence, augmentation of the eminence by allografts and eminectomy may be used [16].

Some other novel techniques used to relax the elevator muscles include the infiltration of local anesthetic solution in and around the joint capsule. Local infiltration of ananesthetic solution only reduces the pain, but it does not have any effect on muscle spasm. Thus, the use of specific nerve blocks that target the deep temporal and masseteric nerves has been extensively described in the literature. It is a safe and alternative method for closed reduction of TMJ dislocation in conjunction with sedation compared to general anesthesia [3,4]. A single injection of masseteric and deep

temporal nerve block is a simple technique that can help reduce the pain and muscle spasm caused by a longstanding dislocated mandibular condyle. It blocks both sensory and motor innervation, relaxes the muscles, and reduces pain. This single injection technique is simple, safe, and easy to implement for both unilateral and bilateral TMJ dislocations.

CONCLUSION

Longstanding unilateral TMJ dislocation is a rare event. The authors recommend radiographic examination or referral to a specialist in cases where the clinical diagnosis is doubtful. The single injection technique is useful in the treatment of the long-standing unilateral TMJ dislocations.

ACKNOWLEDGEMENT

The authors would like to acknowledge that the present case was managed at the Government Medical College, Khandwa (Madhya Pradesh).

CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Cohen L, Kim DJ. New facial asymmetry: a case of unilateral temporomandibular joint dislocation. J Emerg Med. 2014 Jul;47(1):e11-3.
2. Huang IY, Chen CM, Kao YH, Chen CM, Wu CW. Management of long-standing mandibular dislocation. Int J Oral Maxillofac Surg. 2011 Aug;40(8):810-4.
3. Ugboko VI, Oginni FO, Ajike SO, Olasoji HO, Adebayo ET. A survey of temporomandibular joint dislocation: aetiology, demographics, risk factors and management in 96 Nigerian cases. Int J Oral Maxillofac Surg. 2005 Jul;34(5):499-502.
4. Young AL, Khan J, Thomas DC, Quek SY. Use of masseteric and deep temporal nerve blocks for reduction of mandibular dislocation. Anesth Prog. 2009 Spring;56(1):9-13.
5. Laskin DM, Greene CS, Hylander WL. TMDs: An Evidence-Based Approach to Diagnosis and Treatment. Chicago: Quintessence; 2006. p. 415.
6. Lee SH, Son SI, Park JH, Park IS, Nam JH. Reduction of prolonged bilateral temporomandibular joint dislocation by midline mandibulotomy. Int J Oral Maxillofac Surg. 2006 Nov;35(11):1054-6.
7. Quek S, Young A, Subramanian G. The twin block: a simple technique to block both the masseteric and the anterior deep temporal nerves with one anesthetic injection. Oral Surg Oral Med Oral Pathol Oral Radiol. 2014 Sep;118(3):e65-7.
8. Sang LK, Mulupi E, Akama MK, Muriithi JM, Macigo FG, Chindia ML. Temporomandibular joint dislocation in Nairobi. East Afr Med J. 2010 Jan;87(1):32-7.
9. Akinbami BO. Evaluation of the mechanism and principles of management of temporomandibular joint dislocation. Systematic review of literature and a proposed new classification of temporomandibular joint dislocation. Head Face Med. 2011 Jun 15;7:10.
10. Sia SL, Chang YL, Lee TM, Lai YY. Temporomandibular joint dislocation after laryngeal mask airway insertion. Acta Anaesthesiol Taiwan. 2008 Jun;46(2):82-5.
11. Rosemore J, Nikoomanesh P, Lacy BE. Bilateral temporomandibular joint dislocation after PEG tube placement. Gastrointest Endosc. 2004 Jan;59(1):146-7.
12. Nusrath MA, Adams JR, Farr DR, Bryant DG. TMJ dislocation. Br Dent J. 2008 Feb 23;204(4):170-1. doi: 10.1038/bdj.2008.112.
13. Hsiung CP, Suresh S. Closed reduction of a temporomandibular joint dislocation: is this possible with regional anesthesia? Paediatr Anaesth. 2008 Dec;18(12):1269-70.
14 Thomaidis V, Tsoucalas G, Fiska A. The Hippocratic Method for the Reduction of the Mandibular Dislocation, an Ancient Greek Procedure Still in Use in Maxillofacial Surgery. Acta Med Acad. 2018 May;47(1):139-143.
15 Yurino M. New method for reduction of acute anterior dislocation of the mandible. J Oral Maxillofac Surg. 1983 Nov;41(11):751. doi: 10.1016/0278-2391(83)90194-5.
16 WARRAICH RA. TREATMENT OF TMJ RECURRENT DISLOCATION THROUGH EMINECTOMY—A STUDY. Pakistan Oral & Dental Journal.;28(1).