Case Report

A novel autohemotherapy protocol for chronic recurrent temporomandibular joint dislocation in a mentally disabled individual: A case report

Venkatesh Balaji Hange, Shishir Mohan Garg

Department of Oral and Maxillofacial Surgery, KD Dental College and Hospital, Mathura, Uttar Pradesh, India

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Correspondence:
Venkatesh Balaji Hange, Department of Oral and Maxillofacial Surgery, KD Dental College and Hospital, Mathura, Uttar Pradesh, India.
E-mail: venkateshhange@gmail.com

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Abstract

Temporomandibular joint (TMJ) dislocation is a common problem faced in an outpatient setting by maxillofacial surgeons and dentists. It is an excruciating pain often a result of the condyle being locked to the anterior superior aspect of the articular eminence. It may be acute or chronic as well as it may show unilateral or bilateral involvement. Dislocation of the both TMJ is more prevalent with the mandible in a straight open position, whereas with a single-sided dislocation, the mandible is deviated to the opposite side, with a partially open mouth. Myriad treatment options are available for management of chronic recurrent TMJ dislocation which can be broadly classified into surgical (invasive) and non-surgical (conservative) methods. The present manuscript summarizes the experience of managing a case of chronic recurrent TMJ dislocation in a mentally challenged young adult patient using autologous blood injection.

Introduction

Temporomandibular joint (TMJ) dislocation often causes excruciating pain and may be acute or chronic or have a unilateral or bilateral involvement. Most cases are treated with a conservative approach, wherein the condyle is relocated into the glenoid fossa by applying manual pressure applied to the mandible in initially downward and then upward direction.[1] A condition can be called as chronic recurrent TMJ dislocation when condyle dislocates continuously within glenoid fossa multiple times. These cases are not self-limiting and are progressive without any active interventions. An episode of TMJ dislocation could be triggered by routine activities such as yawning and laughing or any instance comprising prolonged mouth opening such as dental treatment and general anesthesia procedures.[2]

In a straight open position, TMJ often dislocates on both sides. In cases, with a single-sided dislocation, the mandible deviates to the opposite side, with a partially open mouth. Dislocation of the TMJ represents 3% of all cases of reported dislocated joints in the body.[3] Chronic recurrent TMJ dislocation is caused by a combination of factors comprising leniency of the TMJ ligaments, TMJ capsule fragility, abnormal size of the eminence, excessive muscle activity/spasms, trauma, and unusual chewing motion that interfere with translation of condyle back to its original position.[4] The consequence of recurrent TMJ dislocation is a progressive internal derangement of TMJ which is caused due to injury to the disc, capsule, and ligaments. Several well-established therapeutic strategies are available for the management of chronic recurrent TMJ dislocation. These treatment modalities can be classified into surgical (invasive) and non-surgical (conservative) methods.[5]

Non-surgical methods comprise physiotherapy, occlusal splint, and avoidance of yawning, laughing which can cause large-mouth-opening, prescribing muscle relaxants and soft diet, injection of sclerosing agents such as 5% sodium morrhuate and 5% ethanolamine oleate (EO), autohemotherapy into the TMJ pericapsular tissues and injection of botulinum toxin into the masticatory muscles.[6,7] Prolotherapy is a method of strengthening lax ligaments by injecting various types of sclerosing or proliferant solutions. It is further acknowledged as "procreative injection therapy," "regenerative injection therapy," or "capsular sclerotherapy." Autologous blood and EO are used as proliferant solutions.[5,8]

The classical surgical protocol includes the mechanical tightening of the capsule, the fastening of the joint parts, the

creation of mechanical interference in the condylar parts, the elimination of interference in the condylar path by eminectomy, reduction of lateral pterygoid muscle pull by myotomy with simultaneous implantation of a silastic sheet, capsular plication, and temporalis tendon scarification. Redirection of the temporalis tendon, deepening of the glenoid fossa by resection of the disc, and condylotomy are the other surgical (invasive) regime used for the management of chronic recurrent TMJ dislocation.[1,9] The present article aimed to reveal the use of autologous blood injection for the treatment of recurrent dislocation of the condyle in a mentally challenged young adult patient.

Case Report

An 18-year-old female patient was referred to the Department of Oral and Maxillofacial Surgery, KD Dental College and Hospital, Mathura, India, with a chief complaint of repeated locking of the lower jaw and being unable to close the mouth [Figure 1]. Case history revealed that the patient was mentally challenged. The patient had difficulty in following the instruction as well as giving an appropriate response. The patients had a deformed thoracic vertebra. The parent of the patient brought a previous CT scan brain which revealed calcification foci in the brain. General examinations also revealed brownish-black scaly patches over the arms.

Medical history revealed that various clinicians tried to manage this distressing condition employing manual reduction on multiple occasions, but none of them were successful in managing the condition. Once chronic dislocation locked, the lower jaw patient was unable to close the mouth. History of this distressful condition dates back 4–5 years. The patient had no history of the previous fracture of the mandible.

Intraoral examination showed an anterior open bite with a deviation of the mandible on the left side on mouth opening. Radiographic examinations were done using an orthopantomogram, which revealed [Figure 2] premature posterior contact associated with an anterior open bite. Prominent gonial angle with blunting of articular eminence was also noted. The diagnosis of chronic recurrent TMJ dislocation was made based on clinical examination, radiographic investigations, and case history. As the patient was mentally challenged and had difficulty following the instructions, invasive surgical treatments as well as conservative treatments, such as intermaxillary fixation using Erich's arch bar, occlusal splint, and dautery's procedure, cannot be used. Hence, prolotherapy using autologous blood injection was used for the management of chronic recurrent TMJ dislocation.

The patient was draped, followed by scrubbing the skin overlying the auricular area and TMJ with an antiseptic solution. The auriculotemporal nerve was anesthetized using a local anesthetic agent (3–4 ml local anesthetic agent is delivered at a point just anterior to the tragus) [Figure 3a]. After achieving signs and symptoms of anesthesia, 4–5 ml of blood is drawn from the antecubital fossa for autologous blood injection. The articular fossa was identified and access to the superior joint space and pericapsular tissue was achieved by injecting 19 gauge needle at a point which is arbitrarily 10 mm anterior and 2 mm inferior to Cantho-tragal line [Figure 3b]. Two milliliters of autologous

Figure 1: (a-d) Pre-operative profile photographs showing an inability to close the mouth due to locking of the lower jaw

Figure 2: Orthopantomogram revealed premature posterior contact, anterior open bite, prominent gonial angle, and blunting of the articular eminence

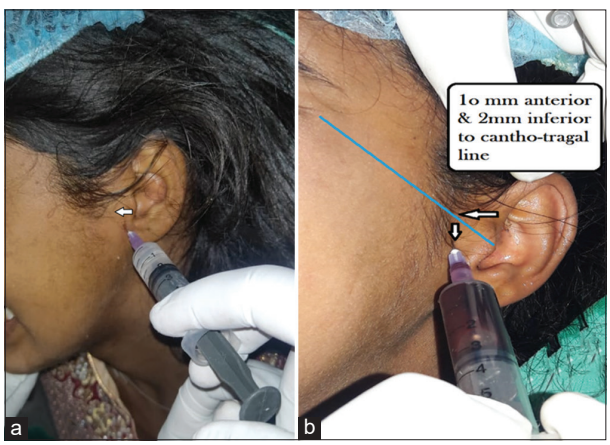

Figure 3: (a) Technique of auriculotemporal nerve block, (b) entry into the joint capsule of temporomandibular joint, the point of insertion should be 10 mm anterior and 2 mm inferior to the cantho-tragal line

blood were injected into the upper joint space and 1 mL around pericapsular tissue. Concurrently, the mouth was opened and the mandible was manipulated forward to open the joint space on both sides simultaneously. Immobilization was achieved by placement of barrel bandage, as intermaxillary fixation using Erich's arch bar or Ivy eyelet wiring. The patient showed a decrease in episodes of dislocations, although the problem was not completely resolved even after restricted mouth opening for 2 weeks; hence, the procedure was repeated.

After repeating the procedure, the episodes of dislocations completely resolved along with the significant tightening of TMJ. Reduction in mouth opening was reported; the patient was able to close mouth voluntarily without any external support which was patients chief complaint. The result of autologous blood injection was successful without any complications [Figure 4].

Discussion

Mandibular hypermobility is a situation described as an excessive laxity of the TMJ that permits excessive mandibular motion. The mandibular hypermobility is divided into subluxation and dislocation. In subluxation, the condyle travel beyond articular eminence, which is usually the endpoint of the condylar motion. In dislocation, condyle dislocates continuously within glenoid fossa due to which mandible locks while opening the mouth.[4]

The absolute destruction of the localized structure by sclerosants is essential in lymphangioma, vascular malformation, renal, and hepatic cysts, but the use of sclerosant in TMJ is very specific. Here, its use is intended to restrict the condylar slide over the articular eminence. Scar formation and contraction are acceptable.[5] The autologous blood injection is a sclerosant/proliferant solution based on hypothesis, in which mandibular movements are restricted by inducing fibrosis in superior joint space and pericapsular tissues by injecting autologous blood into TMJ.[10] In the present case report, the mandibular range of motion was reduced after autologous blood injection in TMJ.

Figure 4: (a-d) Post-operative profile photographs showing reduced deviation of the mandible, along with the ability to close the mouth

The patient was able to close the mouth without any external support. Any complaints of pain also resolved. The findings matched the treatment outcomes mentioned in the published literature.

Louis Schultz, in 1937, popularized prolotherapy for the management of painful subluxation of the TMJ by successfully treating 60 patients. The procedure involves the injection of an irritant solution into a joint space, weakened ligament, or tendon insertion, to resolve complaints of pain. Autologous blood injection is a commonly used prolotherapy solution for the treatment of TMJ subluxation and was first described in 1964 by Dr. Brachmann.[11] The mechanism of action of autologous blood is through the creation of injury which mimics natural wound by injecting blood into the TMJ, which leads to inflammatory cascades causing fibrosis, adhesion, and periarticular soft-tissue scarring, causing restriction of mandibular motion, averting the initial stretching of newly formed fibrous tissue.[7] Degenerative damage of joint, chondrocyte apoptosis, and cartilage degeneration can cause permanent joint destruction. Such destruction may occur by injecting autologous blood into TMJ as per few review literature, although the *in vivo* study on the rabbit by Çandrl *et al.* rejected the theory of permanent joint destruction due to autologous blood injection.[1,12]

Immobilization of mandibular movement has a synergistic effect with prolotherapy for the management of painful subluxation of the TMJ, as reduced movement accelerates the fibrosis in and around the TMJ. Immobilization can be achieved by placement of barrel bandage, intermaxillary fixation using Erich's arch bar or ivy eyelet wiring, etc. The universal agreement for mandibular immobilization ranges from a single week to 1 month.[13,14] The choice of immobilization depends on the mental state of the patient, degree of cooperation by the patient, duration of immobilization, the status of dentition, patient's oral hygiene habits, etc. By consideration of the mental status and the other mentioned factors, immobilization was achieved using barrel bandage, which was applied for 3 weeks from the first session of autologous blood injection.

The method and the duration of immobilization used in our case report are according to the published literature. It is recommended to use 2 cc in the superior joint space and 1 cc in the pericapsular tissue or 2 cc autologous blood injection into the superior joint space. Some researchers suggest a range of volume from 2 cc to 4 cc in the upper joint space and 1.0 to 1.5 cc into pericapsular structures for the management of subluxation of the TMJ.[14,15] In the present case report, 2 cc of autologous blood was injected in the superior joint space and 1 cc in the pericapsular tissue as per the recommended dosage. Repetition of autologous blood injection is a controversial topic, as there is no universally accepted protocol. Researcher Machon *et al.* advocated that prolotherapy should be repeated only if there is a reoccurrence of subluxation. On the contrary, Schulz *et al.*[16] recommended the repetition of autologous blood injection twice a week for 3 weeks regardless of recurrence status.[4,14]

In the following case report, we decided to repeat the procedure of prolotherapy based on the presence of episodes

of dislocation and intensity of pain. There were no potential disadvantages and complications of this technique recorded during the treatment as well as follow-up period. Regular follow-up was done at an interval every week initially, later after completion of therapy, follow up was done at an interval of 2 weeks for about 1 year. In autologous blood injection, maximum efforts are made to bring the TMJ to its former position or, if not possible, at least create an environment mimicking a natural position, this technique can be designated as " Reclamation injection therapy."

Conclusion

Autologous blood injection is an effective prolotherapy used in the non-surgical management of chronic recurrent TMJ dislocation. In the present case, it not only successfully resolved the episodes of dislocations but also tightened the TMJ, reduced the mouth opening and the associated pain. It is a simple, non-invasive, yet effective method in the management of chronic recurrent TMJ dislocation. It has fewer to almost no side effects and complications. Autologous blood injection can be used as primary therapy in cases where patient demand non-surgical therapy or those cases which are unfit for invasive therapy due to local or systemic factors. Cases, where it is not primarily used, can be at least used as an early treatment before surgical interventions. Through the experience of the present case, autologous blood injection could potentially be used as a treatment modality in mentally challenged individuals, along with immobilization without any undue complications or side effects. More clinical studies and research are required in upcoming years to prove the efficiency of this treatment modality, especially among the mentally challenged.

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