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RECLAMATION AUTOHAEMOTHERAPY FOR CHRONIC RECURRENT TEMPOROMANDIBULAR JOINT DISLOCATION IN MENTALLY CHALLENGED YOUNG ADULT: CASE REPORT

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Abstract

Temporomandibular joint (TMJ) dislocation is a common problem faced in an outpatient setting by maxillofacial surgeons & dentists. It is an excruciating pain instance that appears when condyle becomes 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. dislocation of the TMJ represents 3% of all cases of reported dislocated joints in the body. Management of chronic recurrent TMJ dislocation which can be broadly classified into surgical "invasive" and nonsurgical "conservative" methods. Nonsurgical "conservative" methods comprise of 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 Morruhate and 5% Ethanolamine Oleate (EO), autohemotherapy into the TMJ pericapsular tissues and injection of botulinum toxin into the masticatory muscles. There is currently neither abundant scientific literature nor acceptable treatment protocol for the management of TMJ dislocation in mentally compromised individuals.

We propose a new management protocol for chronic recurrent TMJ dislocation using autologous blood injection & immobilization with the help of bandages in a mentally compromised young adult through this case report.

Keywords: *Recurrent TMJ dislocation, autologous blood injection, sclerotherapy, reclamation autohemotherapy, hypermobility.*

Özet

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Anahtar Kelimeler: .

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OVERVIEW / GENEL BAKIŞ

Temporomandibular joint (TMJ) dislocation is a common problem faced in an outpatient setting by maxillofacial surgeons & dentists.It is an excruciating pain instance that appears when condyle becomes 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. Acute mandibular dislocation can be commonly treated using conservative therapy so that they can relocate the condyle in the glenoid fossa by 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, that is not self-limiting but progressive without treatment interventions. The episodes TMJ dislocation triggered by routine activities such as yawning and laughing as well as instances comprise of prolonged mouth opening such as dental treatment and general anesthesia procedures (2).

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. 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. Myriad treatment options are available for management of chronic recurrent TMJ dislocation which can be broadly classified into surgical "invasive" and nonsurgical "conservative" methods (5). Nonsurgical "conservative" methods comprise of not only physiotherapy, occlusal splint, and avoidance of yawning, laughing which can cause large-mouth-opening Prescribing muscle relaxants and soft diet, but also an injection of sclerosing agents such as 5% Sodium Morruhate 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 proliferation solutions. It is also known as "sclerotherapy", "proliferative injection therapy", "regenerative injection therapy" or "ligament sclerotherapy". Autologous blood and ethanolamine oleate 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, temporalis tendon scarification. Redirecting of the temporalis tendon, deepening of the glenoid fossa by resection of the disc, condylotomy are also surgical (Invasive) regime used for management of chronic recurrent TMJ dislocation (1, 9).

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This article aims to propose a new management protocol for chronic recurrent TMJ dislocation using autologous blood injection & immobilization with the help of bandages in a mentally compromised young adult through this case report and to report observations & results of this conservative technique.

Case Report: A 18-year-old female patient was referred to the department of oral and maxillofacial surgery, K.D. Dental College and Hospital, Mathura with a chief complaint repeated locking of the lower jaw and being unable to close the mouth (Fig.1). On taking case history revealed that patient was mentally challenged, she had difficulty in following the instruction as well as giving appropriate response. She also had deformed thoracic vertebrae, patients parent brought previous (computed tomography) CT scan brain which revealed calcification foci in the brain. General examinations also revealed brownish-black scaly patches over the arms. Past medical history revealed that various clinicians tried to manage this distressing condition utilizing a manual reduction at multiple occasions, but none of them were successful in eliminating this condition. Once chronic dislocation locked the lower jaw patient was unable to close the mouth. History of this distressful condition dates back to about 4-5 years when the patient experienced this for the first time. the patient had no history of the previous fracture of the mandible.

Fig.1 preoperative profile photographs showing inability to close the mouth due to locking of lower jaw.

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Intraoral examination showed an anterior open bite with a deviation of the mandible on the left side upon mouth opening. Radiographic examinations were done using Orthopantomography (O.P.G.) revealed (Fig.2) premature posterior contact associated with an anterior open bite. Prominent gonial angle with blunting of articular eminence is also seen. The diagnosis of chronic recurrent TMJ dislocation was made based upon clinical examination, radiographic investigations, and case history. As the patient was mentally challenged & had difficulty in following the instructions, invasive surgical treatments as well as conservative treatments like intermaxillary fixation using Erich's arch bar, occlusal splint, dautery's procedure, etc. cannot be used. Hence Prolotherapy using Autologous blood injection therapy was decided for management of chronic recurrent TMJ dislocation.

Fig.2 O.P.G. revealed premature posterior contact, anterior open bite, prominent gonial angle, blunting of articular eminence

The patient draped inappropriate manner at first followed by scrubbing the skin overlying the auricular area & TMJ with an antiseptic solution. An auriculotemporal nerve was anesthetized using a local anesthetic agent, 3-4 ml local anesthetic agent mepevacaine HCL 2% and epinephrine as Levonordefrin 1:200,000 is delivered at a point just anterior to the tragus (Fig.3a). After achieving signs & symptoms of anaesthesia. 4-5 ml of blood is drawn from the antecubital fossa for Autologous blood injection. The articular fossa is identified & access superior joint space, pericapsular tissue achieved by injecting 19-gauge needle at a point which is arbitrarily 10 mm anterior & 2mm inferior to the cantho-tragal line (Fig.3b).

2 mL of autologous blood was injected into the upper joint space and 1 mL around pericapsular tissue. concurrently opening the mouth and manipulation of the mandible forward was done to open the joint space. The same procedure is performed on the opposite side simultaneously. Immobilization is achieved by

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placement of barrel bandage, as intermaxillary fixation using Erich's arch bar or ivy eyelet wiring avoided concerning the mental status of the patient. The patient showed a decrease in episodes of dislocations but not completely resolved even after restricted mouth opening for 2 weeks hence the decision to repeat the procedure.

After performing the new management protocol for recurrent dislocation of the condyle using autologous blood injection followed by immobilization with the help of bandages for a short period, pain & episodes of dislocation subsided along with patient began closing mouth upon itself without any external support which indicates successful management of recurrent dislocation of the TMJ.

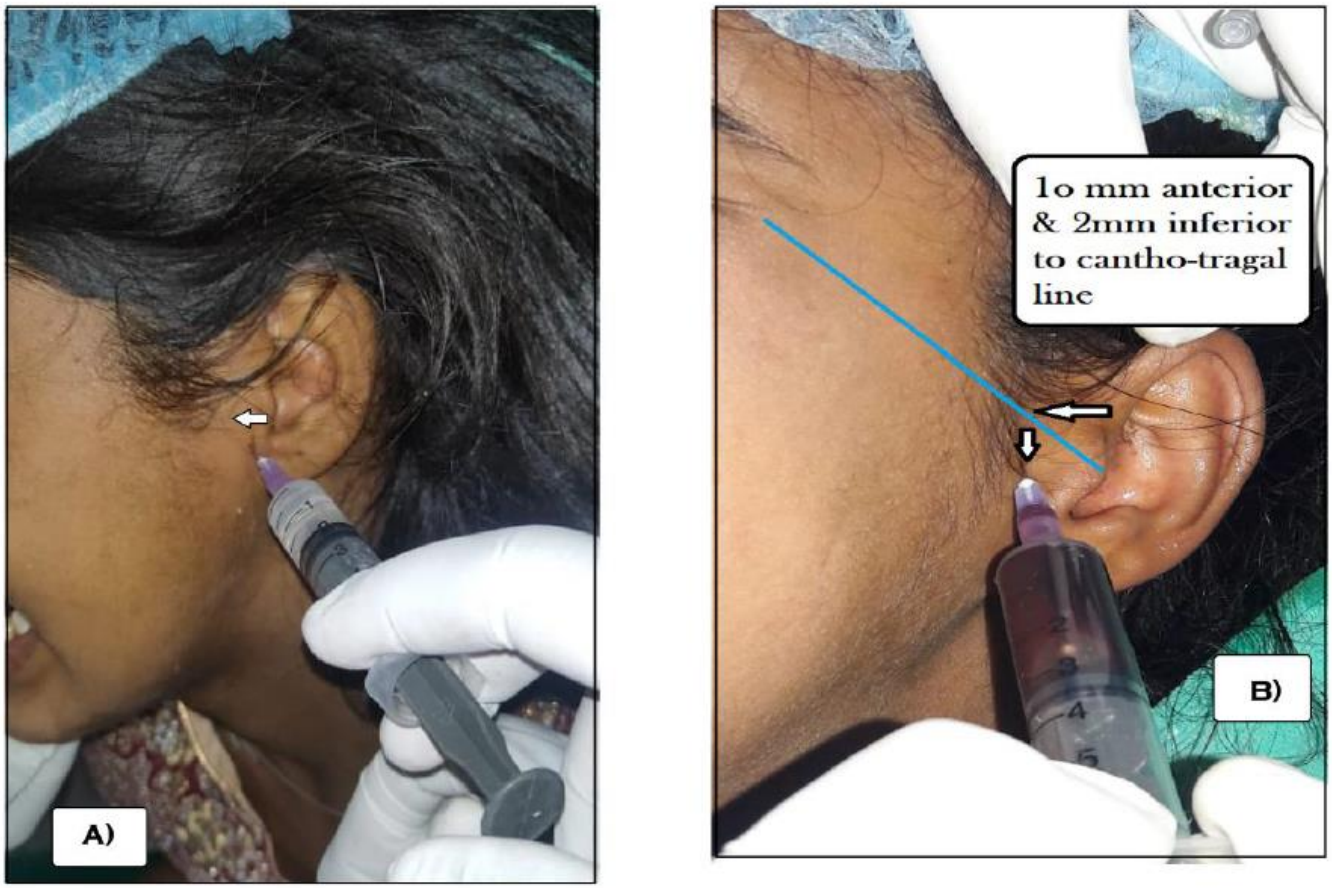

Fig.3 A) showing technique of auriculotemporal nerve block, B) showing to enter the joint capsule of TMJ, the point of insertion should be 10 mm anterior & 2mm inferior to cantho-tragal line.

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 endpoint of condylar motion. Whereas, in dislocation condyle dislocate continuously within glenoid fossa due to which mandible locks while opening the mouth. Patient seek treatment for dislocation as early as possible because this condition is self-limiting (4).

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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, the only restriction of the sliding of the condyle over the articular eminence is required instead of destruction of the localized structure. Scar formation & contraction is acceptable (5).

The autologous blood injection is a sclerosant/proliferant solutions based upon hypothesis in which mandibular movements is restricted by inducing fibrosis in superior joint space & pericapsular tissues by injecting autologous blood into TMJ (10).

In the current study, we discovered that the mandibular range of motion reduced after autologous blood injection in TMJ, the patient was able to close the mouth itself without any external support, complains of pain also resolved these findings are similar to those reported in review literature. Louis Schultz in 1937 popularized Prolotherapy for management of painful subluxation of the TMJ after treating 60 patients encouraging results were obtained through this study. It 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 (11, 22).

The mechanism of action of autologous blood is the creation of injury which mimics natural wound by injecting blood into the TMJ, which later begins development of inflammatory cascades that cause fibrosis induction, adhesion formation, and periarticular soft tissue scarring, with the restriction of mandibular motion to avert 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 but in vivo study on the rabbit by Çandırlı et al. rejected the theory of permanent joint destruction due to autologous blood injection through results obtained in their study (1, 12).

Shereen W. Arafat and Mohamed A. Elbaz's randomized prospective clinical study done a comparison between autologous blood versus dextrose prolotherapy for the treatment of temporomandibular joint hypermobility showed that a significant ($p \leq 0.001$) higher maximum interincisal opening (MIO) values compared to autologous blood injection Group for all follow-up intervals. There were significant ($p \leq 0.001$) reduction in Visual Analogue Scale (VAS) scores at 2 weeks post operationally in autologous blood injection Group While, the reduction in VAS at 2 weeks was non-significant ($p \geq 0.001$) in dextrose prolotherapy group, but at 1-month post operationally VAS started to show significant ($p \leq 0.001$) reduction, thus autologous blood injection was shown superior result than dextrose prolotherapy concerning the number of injections, decrease in pain, and maximal interincisal opening improvement(11).

An experimental study by ElRahmany et al. Conducted Ethanolamine Oleate injection in TMJ capsular and pericapsular tissue on eight New Zealand rabbits showed angiogenesis with the presence of fiber, new-formed bone and cartilaginous hyaline tissue on histopathologic examination. Thus, ethanolamine Oleate injection can be safely used in the treatment of TMJ dislocation (18).

A comparative study between autologous blood and platelet-rich plasma by Menatallah M Yasso, Magued H Fahmy, Nevine S Mohamad for treatment of recurrent temporomandibular joint dislocation showed that both autologous blood and PRP injections significantly decrease mandibular range of motion to normal range & can be easily and safely injected in patients with chronic recurrent TMJ dislocation(19).

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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 protocol for mandibular movement restriction ranges from 7 days to 1 month (13, 15).

Choice of immobilization depends upon the mental state of the patient, degree of co-operation by the patient, duration of immobilization, the status of dentition, patient's oral hygiene habits etc.by taking consideration mental status and other factors we decided to achieve immobilization through use of barrel bandage, which was applied for 3 weeks from the first session of autologous blood injection. The method & duration of immobilization used in our case report is according to the review literature.

Alternatively, injection of botulinum toxin into masticatory muscles, sclerosing agent injection therapy, platelet-rich plasma, and Arthrocentesis followed by autologous blood injection can be used in mentally challenged adults facing chronic recurrent TMJ dislocation. These techniques have certain limitation & side effects, so while deciding the type of treatment these factors should be considered (14).

It is recommended to use 2cc in the superior joint space and 1 cc in the pericapsular tissue or 2 cc autologous blood injection into the superior joint space, whereas other researchers suggest the 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(15, 16). In our case report, we use autologous blood which injected 2cc 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 formulated until now. Researcher Machon et al, advocated that prolotherapy should be repeated only if there is a reoccurrence of subluxation on contrary Schulz et al recommended repetition of autologous blood injection twice a week for 3 weeks regardless of recurrent attack (15, 17).

Recently Toghrul Aliyev, Eynar Berdeli, Onur Şahin reported an interesting unusual complication while performing arthrocentesis was post operationally temporary facial paralysis in the area of the facial nerve and anesthesia of the lingual and alveolar inferior nerves. Arthrocentesis was done using an intraarticular sodium hyaluronate injection.complication occurred during the procedure was secondary to the anesthetic solution,& caused by overflow of anesthetic solution from a traumatic perforation in the joint capsule or mechanical damage caused by the cannula into the infratemporal area (20).

Emine Tatar stated in their review article that management of TMD is multidimensional and contains a combination of patient education, home self-care, physiotherapy, bio behavioral medicine, orthodontic jaw appliance therapy, pharmacological therapy, and surgery. Surgery is considering only treating a structural anatomic disorder that is creating pain and dysfunction & after failure of conservative therapy. The objective of the treatment is to increase function, decrease pain and expand quality of life (21).

In the following case report, we decided to repeat the procedure of prolotherapy based on the presence of episodes of dislocation & intensity of pain. There were no potential disadvantages & complications of this technique recorded during the active treatment period as well as the 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. The findings & results of this case study give the addition of a new combined

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approach for the management of chronic recurrent TMJ dislocation among mentally compromised individuals to review literature.

SUMMARY / SONUÇ

Autologous blood injection is an effective prolotherapy method in the non-surgical management of chronic recurrent TMJ dislocation. It is not only successful in complete resolution of episodes of dislocations along with significant tightening of TMJ but also reduces the mouth opening & pain were reported in our case report. 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 & 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, it can be at least used as an early treatment prior to surgical interventions. Through our experience, we can conclude that autologous blood injection can be successfully used even in mentally challenged individuals along with immobilization without any undue complications or side effects. Limitations of this study include the size of the sample and the lack of comparison with other techniques. Hence more clinical studies & research is required in upcoming years to prove its efficiency of this treatment modality.

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