AUTOLOGOUS BLOOD INJECTION FOR TREATMENT OF RECURRENT TMJ DISLOCATION: A CASE REPORT

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Abstract

Temporomandibular joint (TMJ) dislocation is a distressing condition characterized by locking of the mandibular condyle anterior to the articular eminence and inability of the patient to close the mouth. Various nonsurgical and surgical modalities have been described in the literature with variable success. There is no definite consensus regarding superiority of any treatment modality over the other. The purpose of this article is to present a case of recurrent TMJ dislocation managed by autologous blood injection along with review of literature relevant to this treatment modality.

Key words - TMJ Dislocation; TMJ Luxation; Autohaemotherapy; Autologous Blood Injection in TMJ

Introduction

Dislocation of the temporomandibular joint occur when the head of the condyle moves anteriorly over the articular eminence into such a position that it cannot be returned voluntarily to its normal position. Luxation of the joint refers to complete dislocation, while subluxation is a partial or incomplete dislocation actually a form of hypermobility. Most commonly, luxation take place during normal life activity like yawning or having the mouth opened too widely, as by a dentist extracting teeth or through injudicious use of mouth prop.[1] Here, we present a case of recurrent temporomandibular joint (TMJ) dislocation managed by autologous blood injection along with review of literature relevant to this treatment modality.

Case Report

A 20 year female patient reported to our department with the chief complaint of recurrent locking of lower jaw and inability to close the mouth. History dates back to approximately 2 years, when the patient first experienced this distressing condition. Patient remained stable for variable time followed by recurrence. The condition was managed by manual reduction by various local clinicians. There is marked deterioration of the condition with multiple episodes of dislocation per day. The precipitating factor for recurrent TMJ dislocation was found to be marked nausea and vomiting sensation.

At the time of admission to our department, she was in second trimester of pregnancy. The diagnosis of TMJ dislocation was based on case history and clinical presentation. She was not subjected to radiological examination to avoid radiation exposure to the developing embryo. Because of the high frequency of attacks, severity of the clinical sufferings associated with the condition and failure of the conservative management, it was decided to perform minimally invasive treatment modality. Autologous blood injection therapy seems to be the minimally invasive in this regard. Patient was informed regarding the procedure and written informed consent was taken.

Clinically this patient typically developed significant joint pain in the right TMJ with lack of symptoms on the contra lateral side. It was planned to inject autologous blood only in the right TMJ space and adjacent pericapsular tissue. Firstly, local anesthesia was administered to block the auriculotemporal nerve. (Figure 1)

Figure 1: - Auriculotemporal nerve block was given for local anaesthesia.

This was followed by injecting 3 mL of autologous blood into the upper joint space and 1 mL around pericapsular tissue. (Figure 2)

Figure 2: - Intraarticular injection of autologous blood into right TMJ.

Administration of blood was facilitated by opening the mouth and manipulation of the mandible forward to open the joint space. After the procedure, the patient received specific instructions to guide their post-operative rehabilitation and establish a controlled mouth opening.

During the first 2 weeks, the patient wore an elastic bandage head dressing to limit mouth opening.

Unfortunately, the bilateral TMJ dislocation occurred on the 15th day managed by manual reduction. The significant pain in right TMJ was a biasing factor to inject unilaterally during previous intervention and probably a wrong decision at our part. So, it was planned to inject autologous blood into bilateral TMJ and pericapsular tissues using the same intra operative technique as already described. Post-operative management and instructions remained the same. The idea of bilateral TMJ & pericapsular injections is to enhance the fibrosis bilaterally to further restrict the mandibular movements. During post-operative period patient experienced significant tightening of both TMJs with reduction in mouth opening. The TMJ dislocation stopped altogether for a period of approximately three months.

Bilateral TMJ dislocation occurred thereafter followed by recurrent attacks managed by manual reduction by local doctors. Interestingly, the patient appreciated significant loosening of the TMJ few days prior to reappearance of the condition. She reported to our institution again for the management. The patient was in third trimester of pregnancy and any major surgical intervention was contraindicated at that time instant. The result of autologous blood injection was highly encouraging in this patient. So, it was planned to follow this minimally invasive technique again in the best interest of the patient. Similar protocol was followed again to inject autologous blood bilaterally. The patient was stable without any recurrence for approximately 12 months and is on follow up examination.

Review of Literature

TMJ dislocation occurs because of variable factors which prevent the condyle from translating back to the condylar fossa. These factors are laxity of the TMJ ligaments, weakness of the TMJ capsule, an unusual eminence size or projection, muscle hyperactivity or spasm, trauma and abnormal chewing movements that do not allow the condyle to translate back.[2,3] Recurrent TMJ dislocation may cause injury to the disc, the capsule and the ligaments, leading to the TMJ internal derangement.[3,4] Various nonsurgical and surgical interventions were used in the past, including restriction of mandibular range of motion combined with muscle relaxants and soft diet,[5] injection of botulinum toxin to various muscles of mastication,[6-9] and injection of sclerosing agents.[10,11] Conservative treatment methods are not always successful and therefore multiple surgical interventions were developed including eminectomy,[12] capsular placation,[13] temporalis tendon scarification,[14] and lateral pterygoid myotomy.[15,16]

Autologous blood injection as a treatment of recurrent TMJ dislocation was reported by Brachmann in 1964. He successfully treated 60 patients by autologous blood injections into their TMJ.[17] The therapy is based on the principle to restrict mandibular movements by inducing fibrosis in upper joint space, pericapsular tissues or both. Gulses A *et al* in an animal study demonstrated that, there are significant fibrotic changes evident histologically both in retrodiscal and pericapsular structures. No fibrotic changes were evident when 0.9% normal saline was used on the contra lateral side.[18]

There are no universally accepted guidelines for this therapy. The protocol differs amongst various clinicians. So, the autohaemotherapy include the injection of autologous blood only into pericapsular tissues,[19-22] upper joint space,[23] or into both upper joint space and pericapsularly.[24,25] The volume of blood to be used ranges from 2 mL to 4 mL in the upper joint space and 1.0 to 1.5 mL into pericapsular structures[19-25]. To further enhance the fibrosis in and around the TMJ a period of restricted mouth opening was advocated in the literature. The protocol for mandibular movement restriction ranges from 7 days to 1 month. The method to restrict mandibular movement utilizes conservative elastic bandage head dressing to an aggressive approach of maxillomandibular fixation.[19-25]

The protocol for repetition of autologous blood injection varies amongst clinicians. Machon *et al*. advocated that intraarticular injection should be repeated only if there is recurrence of dislocation. Based on their experience, they advocated surgical intervention in case of failure of two intraarticular injections.[25] Few case reports reported successful outcomes even on single blood injections.[26,27]

Schulz *et al* repeated pericapsular injection therapy twice a week for 3 weeks. Repetition of injection was not based on the recurrence of attack.[21] Similarly, Khan *et al* used 3 injections of autologous blood into bilateral TMJ pericapsular tissues spaced at an interval of 5 days each.[22] Critical evaluation of protocols followed by various authors revealed greater success rates in case of use of both intraarticular and pericapsular injections as compared to either intraarticular or pericapsular injections alone. The variable protocols for repetition of injections and mode of mandibular movement restriction, on critical evaluation revealed that the clinicians who used pericapsular injections, advocated frequent repetition irrespective of recurrence. Also, the same clinicians recommended more aggressive form of mandibular restriction in the form of intermaxillary fixation for greater time period of 2 to 4 weeks.[21,22]

Blood injections to the TMJ basically follow the pathophysiology of bleeding in the joints elsewhere in the body such as knee or elbow[28]. There is distension of joint capsule and pericapsular tissues due to administration of blood. This is followed by an inflammatory reaction during the next few hours or days. The inflammatory reaction results in release of chemical mediators leading to dilation of blood vessels, exudation of plasma, which results in swelling of the adjacent tissues. There is restriction in TMJ mobility due to diminished compliance of the tissues. Organization of blood clot leads to formation of loose fibrous tissue which further enhances the joint stiffness. Last, this tissue matures and causes a permanent limitation of movement of joint[28]. After trauma to the TMJ, ranges of

motion exercises are advocated to avoid restriction of TMJ movements. In the case of TMJ dislocation the intent is exactly opposite. The idea is to induce fibrosis, formation of adhesions and scarring into joint and surrounding soft tissues.[20,24] The immobilization of the mandible subsequently avoids early stretching of the newly formed fibrous tissue.[20]

The autologous blood therapy was challenged by some authors who believe that even a brief exposure of the intraarticular cartilage to the blood may lead to decrease chondrocyte metabolism,[29] chondrocyte apoptosis,[30] cartilage degeneration,[31] and permanent joint destruction.[32] However, Alons *et al* after inducing haemarthrosis in the TMJ of the rats reported that there is no noticeable damage to the cartilage and interposing disc on histopathological examination.[33] Safran *et al* in an animal rat model have found that cartilage changes after blood injections were only temporary without any permanent damage.[34] Candiril *et al* conducted a MRI study of TMJ after injection of autologous blood to treat dislocation. They concluded that there was no significant structural damage in the TMJ after autologous blood injections.[35] Machon *et al* stated that this much amount of blood (2.0 mL) in upper joint space is similar to the amount of blood present after an open TMJ procedure and thus any subsequent joint damage is comparable.[25]

The disadvantage of this technique is the potential for severe restriction in mandibular range of motion. Triantafillidou K *et al* reported that the autologous blood therapy leads to statistically significant reduction in mouth opening in patients of hypermobility.[36] Daif ET in a clinical study reported greater reduction in maximum mouth opening in patients treated with both superior joint space and pericapsular tissues injection as compared to those treated with injection into superior joint space only.[37] So, it is important that patient must undergo a controlled physical therapy schedule to reestablish a functional range of motion. Machon *et al* advocated that the patient should start jaw rehabilitation by gradual and controlled range of motion exercises after 2 weeks of the autologous blood injection therapy.[25]

There are several advantages of the autohaemotherapy as a treatment modality. As there is no tissue dissection, postoperative complications such as facial nerve injuries, altered sensation, swelling, infection and pain are all decreased or nonexistent. The procedure can be performed in an office setting with or without sedation under local anestheia and do not require any sophisticated instrumentation.[25]

Discussion

In our case, the autologous blood injection was administered three times (first time unilateral, second and third time bilateral). Although, it required three interventions for remission of the problem, but practically it was less than three interventions (as first injection was unilateral and probably a wrong decision at our part). The patient is on follow up examination and the mandibular movements and mouth opening remained within the normal limits.

Conclusion

In conclusion, it can be stated that the technique of autologous blood injection for treatment of recurrent TMJ dislocation is a simple, safe and cost effective procedure. This conservative approach can be tried prior to performance of more invasive surgical intervention.

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