

Autogenous Blood Injection (ABI) for the Treatment of Recurrent Dislocation of Temporomandibular Joint) – A Case Report

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Abstract

Recurrent temporomandibular joint (TMJ) dislocation can be treated non-surgically, surgically or in a combination of both approaches. Autogenous blood injection (ABI) into TMJ cavity and pericapsular tissue has been advocated by many authorities to be a safe and effective treatment modality. Here, we would like to share our experience on the management of recurrent TMJ dislocation in a 29-year-old air force serviceman by employing ABI. The post-operative swelling was minimal and persisted for only 3 days. At 2 months follow up, the recovery was uneventful with significant improvement of his TMJ dislocation.

Keywords: *Recurrent Temporomandibular Joint Dislocation; Autogenous Blood Injection*

Introduction

Displacement of one or both the mandibular condyles anterior to the articular eminence could result in temporomandibular joint (TMJ) dislocation [1]. TMJ may be dislocated into anterior, posterior, superior or lateral position. Anterior dislocation occur more commonly than other 3 positions. The exact cause of TMJ dislocation is not known.

However, TMJ dislocation is often seen in patients with excessive laxity of joint capsule or ligament, consumption of drugs that increase activity of lateral pterygoid and infrahyoid muscles, developmental deficiency of glenoid fossa and diseases associated with altered collagen metabolism, e.g. Ehler-Danlos syndrome [1]. Too wide an opening of mouth e.g. during yawning, may shift the mandible forward and beyond the articular eminence when lateral pterygoid muscle relaxes the mandibular condyle (s). Often, most acute TMJ dislocation are reducible. If the TMJ dislocation happens for more than 2 occasions in a patient, many authorities would conveniently define it as recurrent TMJ dislocation [1].

Recurrent irreducible TMJ dislocation is a chronic painful condition and adversely affects the quality of life. Many treatment modalities have been reported to manage recurrent TMJ dislocation. Autogenous blood injection (ABI) was first described by Brachmann in 1964 as a treatment for recurrent TMJ dislocation [2]. Despite its simple and non-surgical nature, ABI has not been widely adopted by the Oral and Maxillofacial Surgeons (OFMS) in Malaysia. In this case report, we present a case of a 29-year-old male air force serviceman with recurrent TMJ dislocation who was later treated with ABI at Tuanku Mizan Malaysian Armed Forces Hospital.

Case Report

A 29-year-old male air force personnel was referred to Oral and Maxillofacial Surgery Department with chronic recurrent dislocation on both the right and left TMJ. 14 months ago, he was involved in a motor vehicle accident. As a result, he suffered severe intracranial hemorrhage and multiple injuries, rendering him in a permanent vegetative state. Neurosurgery was performed shortly in Kuala Lumpur

Hospital to drain the ventricle and to place ventriculoperitoneal shunt. After the stabilisation of his medical conditions, he was transferred to Tuanku Mizan Malaysian Armed Forces Hospital for supportive management. Subsequently, he was fed using nasogastric tube.

The patient was first attended by the OMFS 6 months after his admission to the rehabilitation ward for management of TMJ dislocation which cannot be self-reduced spontaneously. The dislocated left and right TMJ were successfully reduced by manual manipulation with elastic bandage fixation. Since then, he experienced frequent TMJ dislocation (about 2 episodes per week) when he yawned. Clinical examination revealed that both sides of TMJ were easily dislocated when he opened his mouth wide.

The reduction of recurrent TMJ dislocation became increasingly difficult after the fifth attempts. Both conservative and surgical treatment options were discussed. By taking his medical condition into consideration, the parents and the OMFS team had decided that ABI was the treatment option of choice in the patient's best interest. Therefore, written consent was obtained from his father after being given full explanation of benefit and risk of the proposed treatment.

The procedure was performed on both the right and left TMJ under intravenous sedation in the standard operating room. An imaginary line extending from tragus to the lateral canthus of eye was identified. The glenoid fossa was located about a point 10 mm anterior to the tragus and 2 mm below the imaginary line. (Figure 1) A 19-gauge needle was then inserted into the superior joint space after the administration of 1 ml local anaesthetic as an auriculotemporal block (2% lignocaine with 1:80,000) (Figure 2). 10 ml of peripheral blood was collected from the right antecubital fossa. 4 ml of blood was injected into superior joint space whilst the remaining 1 ml was injected into pericapsular tissue (Figure 3).



Figure 1: Immediate pre-operative view demonstrating the identification of the landmarks for the right TMJ.



Figure 2: Insertion of a 19 gauge needle into superior joint space of left TMJ.



Figure 3: Injection of autogenous blood into left TMJ.

Following the procedures, the mandible was fixed with elastic bandage for 3 days. In addition, intravenous cefuroxime 750 mg three times per day and intravenous parecoxib 40 mg 12 hourly were given for 3 days for management of postoperative pain and infection. On day 1 and 2 postoperatively, the TMJ was stable and no major untoward complication. The third night after the procedure, patient's TMJ dislocated while yawning but his father managed to reposition the joint for him. The patient's progress was closely followed every alternate day for 2 months. No further TMJ dislocation was noted during this observation period.

Discussion

Recurrent TMJ dislocation may not present with any symptoms and signs other than repeated annoying displacement of condyle from glenoid fossa. Mild to very severe headache, muscle tension/pain in face, TMJ and neck and tinnitus are the most usual complaints [3]. When severe pain is associated and not easily reduced by the patient, TMJ dislocation can cause detrimental effect on his/her quality of life.

Various substances have been reported for management of TMJ dislocation. They are injected into the superior joint cavity with or without the arthroscopic guidance. These include 5% sodium psylate, sodium morrhuate, and 3% sodium tetradecyl sulfate [4]. Most of them are believed to induced fibrosis of TMJ and thus limit its mobility. However, none has consistently deliver predictable fibrosis to yield long-term clinical benefit to TMJ dislocation patients [4]. Allergic reaction to sclerosants and injection site problems (e.g. infection, thrombophlebitis) are the two most frequent adverse effects described in the literatures. Others, such as gangrene, undesirable skin colour changes, and thrombophlebitis would rarely featured if injudicious injection technique has been employed.

Surgical treatment options were suggested for managing TMJ dislocation of this patient when non-surgical approaches fail to prevent recurrences. Condylectomy, condylotomy, osteotomy and gap arthroplasty, capsulorrhaphy, Dautrey procedure and eminectomy have been reported by their proponents in the literature. These invasive procedures require general anaesthesia. In view of this patient's head injury, the author felt that it was not sensible to apply a surgical approach under general anaesthesia.

ABI is a simple and minimally invasive. Kato et al has advocated ABI as an useful treatment modality for chronic recurrent TMJ dislocation [3]. It could be easily carried out by experienced surgeons under local anaesthesia and sedation in an out-patient clinic. The effectiveness of ABI to treat recurrent TMJ dislocation has been shown by various studies. Of these, Jacobi-Hermanns, *et al.* described their experience with 19 patients treated by ABI. All the patients received ABI and intermaxillary fixation for 14 days [2]. At 18 months follow-up, 17 patients reported no symptoms with desired reduction of mouth opening while the remaining three suffered only temporary dislocation. In a non-blind clinical trial, Daif divided the patients with recurrent TMJ dislocation into 2 groups [5]. The first group was given ABI in superior joint space only while the other group had ABI in superior joint space and pericapsular tissue. Both groups exhibited equally good success rate with no significant structural change to articular disc noted. These results are consistent to that of Machon, *et al's* study [5]. 20 of 25 patients with chronic recurrent TMJ dislocation exhibited no further dislocation 1 year after being treated by ABI into superior joint cavity.

The mechanism of action for injecting autogenous blood into superior joint space and pericapsular tissues is not entirely certain [3]. Akimbami and Daif believe that ABI could induce the inflammation and thus formation of fibrous tissue in the TMJ [4,5]. In addition, blood injected into pericapsular cavity may lead to formation of fibrous adhesion around the pericapsular tissues. The organized blood clot and scarring fibrous tissue subsequently result in the stiffness of TMJ.

On the other hand, the researchers have demonstrated ABI to have mixed conflicting effects on the articular discs. Some have discovered that ABI produces adverse influence on cartilage metabolism and thus irreversible destruction of the articular discs [6,7]. Therefore, the use of ABI in patients from younger age groups is constantly generating controversy [4]. Also, caution should be exercised when considering ABI in those patients who have articular diseases, rheumatoid arthritis and limitation of mouth opening [7].

Conclusion

ABI is an easy and reliable treatment option for recurrent TMJ dislocation. It is safe and requires no surgical exposure with fewer post-operative complications as compared to conventional surgical approach. Nonetheless, the effect of ABI on articular disc is still hotly debated. These concerns could be addressed by performing more properly designed clinical studies to maximise the therapeutic potential of ABI.

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