

Non Surgical Treatment of TMJ Dislocation

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Abstract

Temporomandibular joint is a unique type of joints because it is diarthroidal joint that allows a wide range of movements, but it is controlled by the masticatory muscles, ligaments and a specialized dense fibrous capsule. Any impairment for this structure is considered as temporomandibular disorder. Temporomandibular disorders (TMDs) are that group of pathologies that affect the joint. It is usually manifested by one or more symptoms such as pain, tenderness of the joint, joint sounds, muscle tenderness and or limitation of jaw movements. TMJ dislocation is considered one of the most serious disorders when the condyle travels down and anterior to the articular eminence. It occurs unilateral or bilateral, non-reducible (acute form) or reducible (chronic or habitual form). Many modalities have been described for treatment of chronic TMJ dislocation, either surgical or non-surgical procedures. The conservative methods include restriction of mouth opening combined with soft diets, muscle relaxants, occlusal splints, injection of botulinum toxin into muscles of mastication and injection of sclerosing agents. Conservative treatment methods are not always successful; therefore, multiple surgical interventions were developed including eminectomy, capsular plication, temporalis tendon scarification, lateral pterygoidmyotomy, reduction or augmentation of the articular eminence and condylectomy.

Injection of autologous blood into the temporomandibular joint as a non-surgical treatment modality for chronic recurrent temporomandibular dislocation is considered as a safe and successful technique.

Keywords: TMJ; TMJ dislocation; Non-surgical treatment; Autologous blood injection

Review

Tempromandibular joint (TMJ) is located in front of the ear. It is a unique type of joints because it is diarthroidal joint that allows a wide range of movements, but it is controlled by the masticatory muscles, ligaments and a specialized dense fibrous capsule. Any impairment for this structure is considered as tempromandibular disorder [1].

An articular disc composed of dense fibrous tissue is located between the temporal bone and the mandible, dividing the articular space into an upper and lower compartment. Gliding movements occur primarily in the upper compartment, while the lower compartment primarily functions as a hinge joint [2].

Mandibular movements

Free or empty movements are defined as those occurring without food in the oral cavity. These movements are contrasted with the masticatory movements of the jaw, which are those associated with the incision and chewing of food [2].

The free movements of the mandible, combining rotation and translation, include:

1. Opening and closing.
2. Protrusion and retrusion (symmetrical forward and backward movements), and Lateral shifts of the mandible.

The extreme or outer limits of the various combinations of these movements define what have been called the border movements of the mandible [40-41].

TMJ disorder, more recently known as TMDS (temporomandibular disorders) is the correct term defining the complex, multi-faceted medical problem affecting the jaw joint [3-4].

TMDs are classified into non-articular and articular disorders that may range from a little tempromandibular dysfunction to complete TMJ dislocation [6].

TMJ dislocation is considered one of the most serious TMJ disorders when the condyle travels down and anterior to the articular eminence; it may be unilateral or bilateral, non-reducible (acute form) or reducible (chronic or habitual form) [7].

Because of that articular cartilage is estrogen sensitive; TMD affects one in five adult Americans, 80% of whom are women. In fibrous joints, such as the Temporomandibular joints, estrogen stimulating chemicals have been demonstrated to accelerate degenerative joint disease (DJD) and estrogen repressors to slow the process [8].

TMD can produce arthritis, jaw and facial pain, headache, earaches and restricted jaw movement. The function of the TMJ is extremely complicated; it allows the jaw to move, up and down, side to side (lateral) forward and back (protrusion) and also in many unique combinations, as a person speaks, bites, chews, yawns, etc [9].

It is an exquisite network of ligaments, muscles and nerves, common symptoms range from popping and clicking of the joint to severe and sometimes debilitating pain and dysfunction [9].

The American Academy of Orofacial Pain has classified TMD as shown in Table 1 [5].

Temporomandibular Disorders [5].

1. Congenital or developmental
2. Disk-derangement disorders
3. Degenerative joint disorders
4. Trauma
5. TMJ hypermobility
6. TMJ hypomobility
7. Infection
8. Neoplasia

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Hypermobility can be divided into three inter-related clinical entities:

Hyper-translation: Refers to movements of the condyle in front and above the articular eminence during the opening of the mouth. This is probably a normal state for many individuals [8].

Subluxation: It is considered as an incomplete dislocation of the condyle, where articular surfaces preserve partial contact. At maximum opening, the condyle moves anteriorly towards the articular eminence, and is able to re-take the fossa either through manipulation or spontaneous reduction [11].

Spontaneous dislocation (blocked opening): This is the final stage of TMJ hyper-mobility development. It happens when the condyle moves towards an anterior position with respect to the articular eminence. This position cannot be voluntarily reduced [12-13-14].

Signs and symptoms of acute and chronic dislocation are the same and include: inability to close the mouth, preauricular depression of the skin, excessive salivation, tense spasmatic muscles of mastication, and severe pain of the TMJ [15].

Many modalities have been described for treatment of chronic TMJ dislocation, either surgical or non-surgical procedures. The conservative methods include restriction of mouth opening combined with soft diets, muscle relaxants, occlusal splints, injection of botulinum toxin into muscles of mastication and injection of sclerosing agents [16].

Conservative treatment methods are not always successful; therefore, multiple surgical interventions were developed including eminectomy, capsular plication, temporalis tendon scarification, lateral pterygoidmyotomy, reduction or augmentation of the articular eminence and condylectomy [17].

Autologous Blood Injection (ABI) is a procedure that involves the injection of a patient's own (*autologous*) blood into an area of the body to promote healing.

Autologous blood injection to the TMJ as treatment was first reported by Brachmann [18] in 1964, followed by Schultz [19] in 1973. The therapy is based on the principle to restrict mandibular movements by inducing fibrosis in upper joint space, pericapsular tissues or both.

Blood injections into the TMJ follow the pathophysiology of bleeding in joints elsewhere in the body, creating a bed of loose fibrous tissue in the TMJ area. Hence, the TMJ becomes stiff and is not easy to be dislocated [20].

In addition to red and white blood cells, blood contains platelets, which are rich in substances called growth factors. The growth factors promote normal healing in soft tissues, particularly by facilitating the deposition of new fibrous tissue. In tendons and ligaments, the fibrous tissue may then transform or remodel into collagen, restoring the architecture and strength of the damaged tissue. The amount of growth factor deposited into tendons by ABI is thought to be considerably higher than that brought to the tissues by the body's normal attempts at healing [21].

Study method

The surgical procedure was done under aseptic conditions, using a butterfly cannula; a vascular access to the pinna vein was done to allow aspiration of blood until 1.5 ml was obtained. 1 ml of blood was injected into the superior joint space; 0.5 ml of blood was injected into the peri-capsular tissues. Fixation of the mandible was done by external ligature elastics and left with his mouth closed for 24 hours after injection. Immediately after the surgical procedure, intramuscular injection of Gentamicin to prevent infection. The elastic ring was removed after 24 hours, fed with soft diet consisting.

After one and two weeks, histological evaluation revealed slight decrease in cell number and thickness of condylar cartilage, in addition to increase in fibrous layer as compared with the control. No apparent increase in fibrous tissue collagen fibers as encountered with trichrome stain. The cartilage zone shows regenerative changes with new cartilage formation and the fibrous layer is nearly the same thickness as that of the control after two months. The bone region is similar to the control with areas of new bone formation.

Conclusion

This study is to evaluate the histopathological features with autologous blood injections as a treatment for chronic recurrent TMJ dislocation.

The surgical procedure was done under complete aseptic conditions. Autologous blood was aspirated from pinna vein and re-injected into the superior joint space and peri-capsular area, followed by external ligature elastic for fixation, intra muscular injection of antibiotic and analgesic to alleviate post-operative pain and infection.

Advantages of autologous blood injection is that its application is minimally traumatic, It is very simple and does not require hospital admission or general anaesthesia and could be performed in the outpatient clinic under local anaesthesia, It has reduced risk for immune-mediated rejection. It is simple to acquire and prepare and inexpensive.

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