

Arthrocentesis, Treatment of Temporomandibular Joint Dysfunction - A Case Report

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Abstract: Temporomandibular disorders (TMD) represent a wide range of functional changes and pathological conditions affecting both the jaw joint itself and the chewing muscles and, ultimately, all the other components of the maxillofacial system. Arthrocentesis is a very gentle method for lavage of the joint space. The principle consists in the introduction of a pair of needles into the upper joint space and subsequent lavage using physiological saline or Ringer's solution. Arthrocentesis of the temporomandibular joint is used in both cases of acute closed lock and treatment of various temporomandibular disorders.

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I. Introduction

TMJ dysfunction is an ever increasingly encountered clinical condition. Internal derangement, a type of common disorder of temporomandibular joint. Dolwick defined 'Internal derangement is an abnormal relationship of the articular disc to the mandibular condyle, fossa and articular eminence^{2,3,5}. This disorder has clinical features such as pain, joint sounds, restriction of joint function during mandibular movements and irregular or deviating jaw function⁴. Arthrocentesis is the simplest form of surgical intervention for joint lavage⁹. It is a minimally invasive procedure, which reduces pain, joint sounds and improves mouth opening. It works on the principle that it could loosen adherent disc, remove inflammatory content and pain-mediators allowing nutrient perfusion and thereby allowing free sliding movement of the disc. Arthrocentesis is useful for management of patients with continuing pain in TMJ unresponsive to conservative management, anterior disc displacement with and without reduction and associated osteoarthritis and rheumatoid arthritis^{3,6,7,8}.

II. History

The first detailed description of the indications, technique and therapeutic benefit of arthrocentesis introduces dates back to 1592, when Fray Augustin Farfan described, in the second edition of his work *Tractado breve de medicina* in Mexico, a knee arthrocentesis. However, the first mention can be found in *Libellus de medicinalibus Indorum herbis*, known as the *Codex Badianus*, dated 1552, which was a translation of an Aztec manual of herbal medicine for the Spanish king Charles V. Murakami and colleagues - offered the first systematic description of TMJ arthrocentesis, which they termed manipulation technique after pumping and hydraulic pressure-- used the posterior port only for pumping fluid into the upper compartment to increase the hydraulic pressure within the joint a modification of the traditional method, whereby two needles instead of one are introduced into the upper joint space.

Arthrocentesis of the temporomandibular joint was first described by D. W. Nitzan in 1991 as the simplest form of surgical therapy with the aim of washing out inflammatory mediators, releasing the articular disc, and disrupting adhesions between the surface of the disc and the joint fossa by hydraulic pressure of the lavage solution.

III. Description Of The Procedure

Arthrocentesis of TMJ refers to lavage of the upper joint space, hydraulic pressure and manipulation to release adhesion of the anchored disc phenomenon and improve motion.

Today TMJ arthrocentesis is not only used in the treatment of acute closed lock but in various other temporomandibular joint disorders as well as treat those patients with painful clicking to release intra articular adhesions and anteriorly displaced non-reducing discs, and to confirm other diagnostic findings that could warrant surgical intervention. It has been considered as the first line of surgical treatment for patients with TMJ

disorders who do not respond to conservative therapy such as inter -occlusal devices, physical therapy, drugs, light diet, behavioral and lifestyle changes.

Munna Sha aged about 18 years suffering from TMJ dysfunction since last 2 years. All conservative treatment done like active Jaw movement and taking muscle relaxant since 2 months. But in spite of all the treatment he was suffering from pain at both TMJ during opening and mild deviation of Jaw . Clinically he had clicking sound on TMJ.

Lavage of the upper TMJ compartment is done with a fluid such as saline, lactated ringer solution and anti-inflammatory, opioid and steroid drug.

Patient was seated at a 45 degree angle with head turned to the unaffected side and preparation of the target site done by povidone iodine solution and accordingly draping was done.

Auriculotemporal nerve block was administered which provides optimal region analgesia, preventing the need for sedation. The Canthotragal line was drawn which connected the medial portion of the ear tragus to the lateral corner of the eye. Two needle insertion points are marked on the line, the first, more posterior point will be at a distance of 10 mm from the tragus and 2 mm below the canthotragal line-- approximate area of the maximum concavity of the glenoid fossa. The distance is about 25mm from skin to the center of the joint space. The second point will be 20 mm in front of tragus and 10 mm below this same line. This marking indicates the site of the eminence of the TMJ.

Two 19 gauge needles are inserted in the anterior and posterior recesses of the upper joint space. Through one needle, Ringer's lactate 100–300 ml is injected into the superior joint space and the second needle acts as an outflow portal, which allows lavage of the joint cavity .At the end of procedure 100 mg Hydrocortisone is injected through the posterior recess into the superior joint space and the patient jaw is manipulated in vertical protrusive and lateral excursions simultaneously.

The amount of solution is important as well. In his study, Zardeneta recommends 100 mL of Ringer's solution, which is sufficient to eliminate specific proteins and proteases¹⁵. In contrast, Kaneyama recommends 300-400 mL, during which interleukin 6, bradykinin and other proteins are washed out¹⁶.

Next, the patient is asked to close his or her mouth. This way, the fluid is drained from TMJ.



IV. Conclusion

Arthrocentesis mainly changes synovial fluid viscosity, thus contributing for the translation of the disc and mandible head complex. In addition when performed under pressure and combined with shearing forces generated by jaw manipulation it could break down early adhesion and improving mouth movement. Pain is decreased and eliminated due to wash out of chemical pro inflammatory mediators and associated to the direct action of instilled drugs on intracapsular pain receptors. Clicking usually disappears due to decreased friction and lubricating effect.

Arthrocentesis of the temporomandibular joint is a minimally invasive method of treatment located at the boundary between conservative and surgical therapy. It is usually performed on an outpatient basis under local anaesthesia.

It is a method with a minimum number of complications, it is simple and not demanding in terms of instruments, and it can be performed repeatedly. Therefore, it has become widespread and very popular in the treatment of internal disorders of the temporomandibular joint.

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