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Arthrocentesis: A Boon for TMJ Pain Relief

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Abstract

Temporomandibular disorder (TMD) is the most common cause of orofacial pain of nondental origin. It leads to limitation of mandibular movement, pain with mandibular function and joint sounds. TMJ Arthrocentesis is generally suggested in patients irresponsive to conservative therapies; is simple, minimally invasive technique that can be used instead of more invasive procedures in patients with pain.

Keywords: TMJ Arthrocentesis, temporomandibular joint, temporomandibular joint disorders, Dexamethasone.

Introduction

TMJ is a diarthrodial synovial joint, composing of temporal bone and mandible, numerous associated muscles and ligaments and a specialised fibrous tissue the articular disk.[1] Functionally TMJ is a compound joint; with articular disk separating the joint into upper and lower compartments.

The lower compartment permits gliding as well as rotatory movement while upper compartment permits gliding or translatory movements. Articular disk is a non-vascularised, non-innervated dense fibrous tissue with adequate strength to resist pressure,[2] adapts to functional demands of articular surfaces due to its flexibility.[3] Temporomandibular disorder(TMD) is the most common cause of orofacial pain of nondental origin.[4,5] It is a term used to describe disorders involving the temporomandibular joints (TMJs), masticatory muscles, and occlusion resulting in muscle or TMJ pain, restricted movement, muscle tenderness, and intermittent joint sounds.[6,7] A treatment strategy for TMDs consists of various nonsurgical (drugs, interocclusal devices and physiotherapy)and surgical methods.A nonsurgical approach is recommended for initial management,[7,8] and if this failed, surgical intervention should be considered.[9] However, surgery in this region is associated with many risks.

Three cardinal signs of TMJD may be

(a) Limitation of mandibular movement

(b) Pain with mandibular function

(c) Joint sounds.

Arthrocentesis of TMJ has emerged over the years as a useful technique to manage TMDs. The arthrocentesis was first reported by Nitzan et al. as a simple and effective minimally invasive modality.[10] It is commonly defined as the lavage of the TMJ without viewing the joint space using sterile needles and sterile irrigants so as to reduce the pain by removing inflammatory mediators from the joint or to increase the mandibular mobility by removing intra-articular adhesions by means of hydraulic pressure from irrigation of the upper chamber of the TMJ. Arthrocentesis is generally suggested in patients irresponsive to conservative therapies.[11,12]Most common intraarticular injections following arthrocentesis are steroids and sodium hyaluronate.[13,14]

The aim of this article is to evaluate the efficacy of the arthrocentesis in TMJ disorder.

TMJ Arthrocentesis

The patient was seated at a 45 degree angle, with the head turned to the left.

Pre procedural considerations

Before performing the procedure, the following points should be kept in mind:[15]

1. Left preauricular area is shaved and scrubbed with 5 % povidone–iodine and draped following all aseptic precautions following preoperative mouth opening.

2. The external auditory meatus on the right side was blocked with a cotton plug to protect it from accumulation of blood and fluid.

3. Auriculotemporal nerve block was given using 26 gauge long needle.The needle was advanced behind the posterior aspect of the condyle in an anteromedial direction to a depth of 1 cm and 1.5 ml of local anesthetic (2 % Lignocaine with 1:80,000 Adrenaline) was deposited after aspiration.

Procedure

The classical technique to perform TMJ arthrocentesis utilizes double access to the joint cavity where two needles were used, one for injecting and the other for aspirating the injected solution.

Markings for needle insertion were placed using skin marking ink (Fig.3).

- Canthotragal line: A straight line is drawn on the skin joining the medial portion of the tragus of the ear to the outer canthus of the ipsilateral eye (Holmlund–Hellsing line)
- Two points are marked on this line for needle insertion.

Point A: More posterior point is marked at a distance of 10 mm from the tragus and 2 mm inferior to canthotragal line. This point corresponds to the posterior extent of the glenoid fossa.

Point B: The second point is marked at 20 mm anterior to tragus and 5 mm inferior to canthotragal line; which corresponds to the height of articular eminence.

- To increase the joint space during arthrocentesis, the patient was asked to open the mouth and deviate it to the opposite side so as to distract the condyle from the glenoid fossa thereby increasing joint space.
- The first needle (18 gauge) was inserted into the superior joint space in the most posterior point at point A directing upward, forward, and inward to a depth of about 20–25 mm, after the tip of the needle has come into contact with the posterior wall of the articular eminence.
- A second needle (18 gauge) was inserted at point B to establish a free flow of the irrigating solution through the superior joint space (Fig.4).
- This is followed by administration of 30- 50 ml Ringer's lactate solution through the first needle.

- 4 mg dexamethasone was injected in superior joint space following arthrocentesis.
- Entry ports were covered with sterile dressing for 24 hrs and patient was prescribed amoxicillin (500 mg) and clavulanic acid (125 mg), chlorzoxazone (500 mg), diclofenac potassium (50 mg) and paracetamol (325 mg) and rabeprazole 20 mg bd for a period of 5 days.
- Immediate postoperative mouth opening was measured to be as 33 mm (Fig. 5).

Fig.1: Preoperative mouth opening- 28 mm

Fig. 2: OPG

Fig.3: Point A and Point B on Canthotragal line.

Fig. 4: 2-18 G needles in place

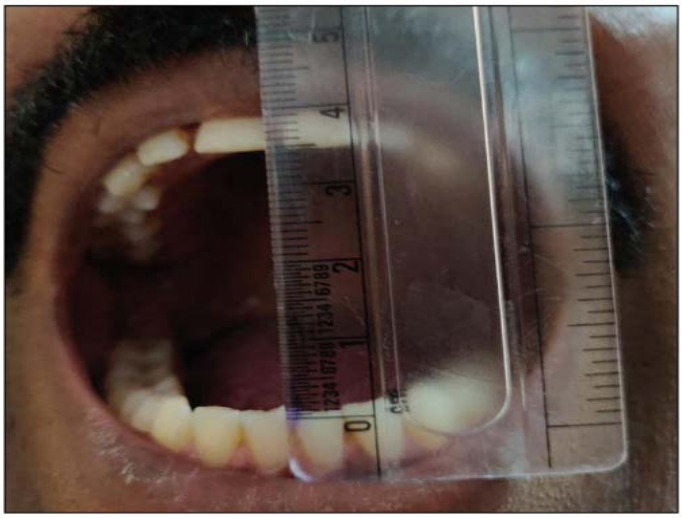

Fig.5: Postoperative mouth opening-33 mm

Discussion

Normal function of TMJ is characterised by absence of pain or joint sounds with smooth and coordinated mandibular movements. TMJD, therefore, constitutes limited jaw movement, discomfort sometimes associated with popping or clicking sounds. Aetiology of TMJD can be extracapsular or intracpasular. A thorough joint assessment is necessary to differentiate between the two as both have distinct managements. Myofascial pain, myalgia can refer as TMJ pain, osseous anomalies like calcification of styloid process, coronoid hypertrophy may also impede the normal mandibular function and may mimic intracapsular disorders. Internal disc derangements

with or without reduction constitute intracpasular disorders.[16] The hypoxia-reperfusion cycle can lead to the release and production of reactive oxygen species leading to degradation of hyaluronic acid and reduced viscosity of synovial fluid,[17] resulting in more friction and adhesion of articular surfaces.

Since the report by Nitzan et al.[10], arthrocentesis has been rapidly expanded as a useful nonsurgical treatment to unlock the jaw in patients with TMJ acute closed lock; but the number of publications about its results has been unexpectedly few. Nitzan et al.described the high success rate of 91% on 17 cumulative cases in the report. The age and onset of locking are varied, but they reported that most cases were satisfactory.[10]

Arthrocentesis of the TMJ is commonly defined as a lavage of the joint and is traditionally accomplished without viewing the joint. [12,13] The chief role of Arthrocentesis lies in release of adhesions, washing out of inflammatory mediators and also, the direct action of instilled medications. In the presented case, 4 mg dexamethasone was injected into the joint space, for its anti-inflammatory benefits both for the pathologic condition and to reduce post-procedural inflammation. According to Frost and Kendell[18] arthrocentesis may be considered as a treatment modality lying in the spectrum between non-surgical treatment and arthroscopic surgery.

Conclusion

Arthrocentesis of the TMJ is a minimally invasive chair side procedure that may be considered before more invasive surgical intervention for internal derangement of the TMJ. It is a method with a minimum number of complications and significant clinical benefits.

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