

Temperomandibular Joint Arthrocentesis - A Study Report

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Abstract: Internal derangement of the temporomandibular joint (TMJ) is characterized by displacement of the intra-articular disc resulting in clicking and popping sounds. However, the displacement of the articular disc does not always cause a mechanical obstruction. These conditions may be painless or they may be associated with pain, especially during function. The most common causes are trauma, which results in an immediate displacement of the disc, or chronic parafunction, which results in degenerative changes in the articular surfaces, increased friction and gradual disc displacement. The study aims to discuss the role of arthrocentesis in the treatment of internal derangement of the TMJ and present clinical data relating to the efficacy of arthrocentesis.

Key words: Temporomandibular Joint • Arthrocentesis • Minimally Invasive Surgery

INTRODUCTION

Arthrocentesis can be described as lavage of the temporomandibular joint space using a sterile irrigation solution. This can be accomplished under local anesthesia safely and comfortably as an outpatient procedure.

Murukami *et al* described Arthrocentesis of the TMJ as “Manipulation technique” followed by pumping & hydraulic pressure [1- 3].

In 1991 Nitzal and his co-workers described a simple treatment procedure for temporomandibular joint disorder called arthrocentesis[4-6]. This involved copious irrigation of the superior joint space using two needles under local anesthesia though arthroscopic procedure were initially used for diagnostic procedures, in recent times it is used for arthroscopic lysis & lavage of the joint. Various irrigation solutions like ringer’s lactate, normal saline have been used successfully for this procedure [7].

The idea is to wash out the joint inflammatory cells in the jaw joint which causes the pain & restricted jaw movements. Steroids may also be instilled into the jaw joint depending in the severity of the condition the rationale of the study is to provide good symptomatic

relief with minimally invasive procedure[8]. This is a simple and cheap alternative to expensive surgical procedures.

Internal derangement of TMJ particularly with closed lock can be treated with this procedure safely and effectively.

MATERIALS AND METHODS

This method was conducted in the department of oral and maxillofacial surgery. This study was done on patient who had this procedure done under local anesthesia for temporomandibular joint disorder. The selected age ranges of the patients were 20 to 45 years with no sex predilection. The duration of the presenting complaints ranges from 1 month to 6 months. A details history and clinical evaluation was done prior to the procedure. Clinical examination was done to measure maximum pain free mouth opening, measured from the incisal edge of the upper and lower incisors in millimetres.

Determining the presence or absence of click with the jaw movements. Bimanual palpation of masticatory muscles for pain assessment. Pre auricular finger pressure

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to assess pain in TMJ region and visual analogue scale to assess pain with mandibular movements. The radiographic evaluation includes OPG to rule out any bone and joint pathologies.

Procedure: We did study of TMJ arthrocentesis for 10 patients in the Department of Oral and Maxillofacial Surgery for 3 years. The patients were made to sit comfortably on the dental chair in the minor operating theatre. The skin over the TMJ region was cleaned and prepared with betadine solution. The skin markings were done to guide the landmarks for the needle insertion [9- 12]. The line which guides the landmarks is tragus canthal line or (HOLMLUD HELLSING). A point (A) is marked from the tragus 10mm forwards and 2mm down from the tragus which shows the posterior extent of the joint space. Another point (B) is marked 10mm from (A) and 10mm down from the line in anterior extent of the

joint space. Auriculotemporal nerve block was given using 2% lignocain with 1: 100000 adrenaline solution. A 19 gauge needle was inserted in the upper joint space and 5 millilitres of ringer’s lactate was injected to distend it. The second needle 21 gauge was inserted carefully in position (B) and the outflow of the previously injected fluid indicated the correct placement of the needles in the joint space. About 100 to 200 ml of the solution was used to wash the joint and a momentary finger pressure was used to block the outlet needle a couple of time to cause distension and lysis of any joint adhesions[13]. After the procedure, the outlet needle was taken out and a steroid injection was given just before the inlet needle was taken out. Mouth opening and jaw movements were guided gentle to further facilitate and achieve maximum mouth opening [14]. Post operatively patient was given tab. Zerodol Serratiopeptidase bd for 5 days and instructed to have soft diet for next 24hrs.



Fig. 1: OPG



Fig. 2: MRI



Fig. 3: Pre operative



Fig. 4: Skin Markings



Fig. 4: Needle Insertion



Fig. 5: Arthrocentesis in Progress



Fig. 6: Pre operative



Fig. 7: Post Operative

Table 1: Mouth Opening

Case no.	Pre operative (Before)	Immediate post operative (After)	1 week	1 month	3 months	6 months
1.	34mm	36mm	34mm	38mm	36mm	38mm
2.	24mm	34mm	30mm	33mm	36mm	36mm
3.	16mm	36mm	34mm	34mm	36mm	37mm
4.	27mm	38mm	35mm	38mm	39mm	42mm
5.	16mm	38mm	36mm	38mm	37mm	39mm
6.	16mm	18mm	23mm	22mm	22mm	23mm
7.	24mm	33mm	34mm	36mm	36mm	37mm
8.	25mm	33mm	35mm	34mm	36mm	36mm
9.	21mm	32mm	34mm	32mm	35mm	33mm
10.	29mm	35mm	33mm	35mm	33mm	35mm

Table 2: Statistic Analysis

MOUTH OPENING	MEAN	N	Std. DEVIATION	Std.Error mean	Correlation	t	p Value
Before	23.20	10	6.052	1.914	0.371	4.822	0.001*
After	33.03	10	5.755	1.820			

*p value significant at level <0.05

DISCUSSION

The history of arthrocentesis dates back to many years but, it has gained popularity in the recent years in treating a variety of joint disorders. The first reported therapeutic arthrocentesis was said to be done using unspecified thorns by Aztec Indians.

Nitzan *et al.* [11], Nitzan *et al.* and Forst *et al.* described simplified form of arthroscopic lavage and lysis of the joint. This study showed a success rate of 91% in 17 cases while Forst *et al.* reviewed 40 cases of acute temporomandibular joint disorders. While the procedure proved reliable in patients with acute TMJ locking, others with chronic or osteoarthritic cases as well as patients with history of jaw joint surgeries, did not show such satisfactory results.

Ohisini [15] described the use of the arthroscopy of the TMJ in 1975, since then various modifications and improvement in the techniques of the TMJ disorders.

Hosaka *et al.* [16] reported 74% success rate with arthrocentesis in patients with painful closed lock of TMJ while Murakami *et al.* reported a 70% success rate in their study. Dimitroulis *et al.* also reported a significant improvement in such patients.

Internal derangement of temporomandibular joint varies from clicking accompanied with normal mouth opening, to clicking with restricted mouth opening (closed locked). The use of arthroscopic lysis and lavage of the superior joint space in re-establishing the normal jaw function has gained much recognition in recent times and it is thought that the concept of arthrocentesis evolved from these procedures. This mode of treatment has shown remarkable success rate despite not using major surgical interventions.

Nitzan *et al.* in his publication said that arthrocentesis is a turning point in treating TMJ disorders. He attributed the success of the procedure to arthroscopic lysis and lavage and hydraulic pressure used in the upper joint compartment. This procedure was found to be highly effective in restoring the normal jaw function and maximum mouth opening. "The effectiveness of this approach was claimed to be due to release of the trapped, anteriorly displaced disc by the basic arthroscopic instrumentation, thereby enabling its repositioning"

By definition, arthrocentesis does not involve relocation or recontouring of the disc. The rationale underlying these manipulations is to free the disc obstruction which restricts jaw movements using hydraulic pressure.

Sterile irrigation solution like Ringer's lactate, normal saline or Hartmann's solution is used for this purpose. The composition of the solution has no effect in influencing the result of the procedure. The idea of this procedure is to distend the joint and cause lavage without altering the structure or position of the disc. Release of the negative forces, reduction in the surface friction and release of the stuck disc phenomenon also, have been attributed to the possible correction of the jaw joint disorder.

A high female preponderance may be attributed to the sex hormones, like estrogen and prolactin which increases the production of pro-inflammatory cytokines [17]. These may inhibit the fibrocartilagenous synthesis of cartilaginous structure in the jaw joints, causing cellular matrix degeneration.

A joint wash out helps in reducing the joint inflammatory components [18,19] and to re-establish its normal movements along with reparative and adaptive functions. Inflammatory cells like interleukins, prostaglandins, leukotrienes have been noticed in significant concentrations which amount to the painful events in the joints. These provide sufficient evidence that the same pain mediators cause similar problems in patients with TMJ disorders.

Arthrocentesis is aimed at reducing the symptoms by removing the inflammatory cells by joint wash out. Thereby allowing the normal cellular inflow and expediting joint repair.

Control of the factors that initiate joint discomfort is important in the treatment phase.

The following complications although rare can occur.

- Extravasations of fluid into the surrounding tissue
- Hematoma with risk for infection
- Broken instruments
- Tenderness of preauricular region
- Middle ear effusion
- Transient facial palsy

The operator should know the disease stage and behaviour before deciding the treatment plan. He should have the treatment options for the same. Patients should be well informed about the procedure cost effectiveness and potential complications.

The merits of the procedure are that it does not cause any major complications or worsen the problem associated with TMJ. The possibility to complete the treatment as an outpatient procedure with minimal

complications makes it first choice treatment for the jaw joint problem. The advantage outweighs the disadvantages.

CONCLUSION

Based on the study and the results we can see that Arthrocentesis is

- Minimally invasive
- Easy to carry out as an outpatient procedure
- Low morbidity
- Cost effective
- Effective and efficient alternative to invasive surgical procedure
- Procedure can be repeated if required
- Significant improvement noted with this procedure
- This could be carried out as an intermediate procedure before carrying out more invasive surgery.

We therefore concluded that arthrocentesis is helpful for those who fail to respond to the conservative treatment.

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