

# Impact of Arthrocentesis in Treatment of Temporomandibular Joint Problems

Imad K. Abbas al-Rifae<sup>1\*</sup>, Zaid M. Akram<sup>2</sup>, Qaisar K. Oraibi<sup>3</sup>

<sup>1</sup>Oral and Maxillofacial Surgery., Department of Dentistry, Al-Mustaqbal University College, Hillah 51001, Iraq

<sup>2</sup>Oral and Maxillofacial Surgery., Department of Dentistry, Al-Rafedain University College, Baghdad, Iraq

<sup>3</sup>BDS CABMS (OMFS),. Dentistry Department, Al-Esraa University College, Baghdad, Iraq

Received: 16th September, 2020; Revised: 07th October, 2020; Accepted: 05th November, 2020; Available Online: 25th March, 2021

---

## ABSTRACT

**Background:** Temporomandibular joint (TMJ) illnesses denote varied pain and dysfunction circumstances connecting the masticatory scheme and decrease life eminence of the subjects. Arthrocentesis is a modest and less offensive operating technique for managing interior imbalance than arthroscopy and recovering than additional traditional techniques as medications, occlusal applications, and rehabilitation. The study aimed to assess the efficiency of arthrocentesis, in combination with a steadying immobilize, in refining purpose, dropping pain, and inhibiting additional worsening of the TMJ function.

**Methods:** This study was done in Al-shaheed Ghazi Al-Hareeri Hospital, Department of Oral and Maxillofacial Operation. Entirely patients recognize with TMJ illness after do X-ray in the radiological department. Total of 40 patients (4 men) and (36 women) with an age of 18–35 years old. Each patient was assessed for the subsequent strictures preoperatively and followed up for 1 month after the previous lavage.

**Results:** This study revealed marked female predilection with a female ratio of about 90% (36 patients) and a male ratio of 10% (4 patients), with a mean age of 23.32 years old, range between 18 and 35 years old. In general, all patients tolerated treatment procedures without any serious complications during either Arthrocentesis and previous medication and splint therapy. The results of parameters after one-month follow-up were:

*pain level (VAS):* Group A: mean 2.2, Group B: mean 2.8 So group A get better than group B.

*Maximum mouth opening:* Group A: 39.8 mm, group B: 38.6 mm.

*Joint click:* At the end of follow up only 6 patients show no change in joint click; all others show a decrease in clicking.

**Conclusion:** Using 0.9% normal saline solution and betamethasone injection with occlusal splint have satisfying benefits, ease, security, patient's approval of injection procedure, and absence of important adverse effects and problems.

**Keywords:** Arthrocentesis, Temporomandibular joint, Treatment.

International Journal of Drug Delivery Technology (2021); DOI: 10.25258/ijddt.11.1.30

**How to cite this article:** Abbas al-Rifae IK, Akram ZM, Oraibi QK. Impact of Arthrocentesis in Treatment of Temporomandibular Joint Problems. International Journal of Drug Delivery Technology. 2021;11(1):166-169.

**Source of support:** Nil.

**Conflict of interest:** None

---

## INTRODUCTION

The temporomandibular joint (TMJ) attaches the mandible to the skull and controls the action of the jaw. TMJ considered the more complicated and more joint that use by persons.<sup>1</sup> TMJ function is chewing and talking. TMJ disorder like an injury to joints, head and neck muscles, other causes like crushing or squeezing the teeth; dislocation of the disc; osteoarthritis or rheumatoid arthritis of TMJ.<sup>2</sup> Most usual symptoms of dislocation are pain, internal instability, arthritis, and traumas<sup>3</sup> Most are age 20–40 years old, and more in males.<sup>4</sup> Temporomandibular disorder (TMD) is the general term used to describe the manifestation of pain and/or dysfunction of

the TMJ and its associated structures. We have three types of intra-articular disorders of the TMJ.<sup>5</sup> Arthrography and magnetic resonance imaging (MRI) have demonstrated the structure associated with the functional limitation caused by disc displacement.<sup>6</sup> Interior imbalance of the TMJ is an advanced illness that commonly began with ticking linked with the usual opening of the mouth (anterior disc movement with discount), according to a stage of clicking progressively stops but the limited opening of mouth follows. This is credited to a nondeductible moved articular disc anteriorly performing problem for sliding condyle.<sup>7</sup> The study aimed to assess the efficiency of arthrocentesis, in combination with a steadying immobilize, in refining purpose, dropping pain.

---

\*Author for Correspondence: drimadkabbass@gmail.com

## METHOD

A prospective study for 40 patients (3 men, 37 women), all patient's symptoms had better included at the Department of Oral and Maxillofacial Operation in Al-Shaheed Ghazi-Alhareeri Hospital. Entirely patients identified with TM illness according to CT scan diagnosis. Inclusion criteria:

- A. Anterior disc dislocation associated with reduction (diagnosed the following):
  1. Inadequacy opening of the mouth.
  2. Pain pre-auricular, headache, and tenderness in the temporal and occipital region.
  3. Symptoms remain for 3 months in the least period.
  4. Clacking.
- B. CT scan (soft tissue window depend on disk density) diagnosis of anterior disc displacement with reduction.

### Exclusion Criteria

- A. Systemic illness
- B. History of condylar trauma or arthritis.
- C. Degenerative variation of the condylar head
- D. Facial irregularity, retrognathism, prognathism.

Forty patients alienated into two groups: group A 10 patients, group B 30 patients.

*Group A:* Symptoms did not recover after the use of occlusal immobilization and medicines, so they experienced arthrocentesis post two weeks of treatment and four to six weeks of an occlusal splint.

*Group B:* Patients who only used medications for 2 weeks and occlusal splint for 4–6 weeks. Then symptoms approved without arthrocentesis.

At the initial visit, for every patient, demographic data, chief complaint and thorough history were collected and clinical examination for TMJ, related muscles, dentition and occlusion were performed. All patients in this study were diagnosed as having internal derangement with reduction based

**Table 1:** Sex distribution

|        | Frequency | Percent (%) |
|--------|-----------|-------------|
| Male   | 4         | 10          |
| Female | 36        | 90          |
| Total  | 40        | 100         |

**Table 2:** Age Distribution

|       | Frequency | Percent (%) |
|-------|-----------|-------------|
| 18-25 | 21        | 52.5        |
| 26-30 | 14        | 35.0        |
| 31-35 | 5         | 12.5        |
| Total | 40        | 100.0       |

**Table 3:** VAS and MMO for group A

|                  | Mean    | N  | Std. deviation | Std. error mean |
|------------------|---------|----|----------------|-----------------|
| VASPre<br>Pair 1 | 7.6000  | 10 | .84327         | .26667          |
| VASPost          | 2.2000  | 10 | 1.03280        | .32660          |
| MMOPre<br>Pair 2 | 35.5000 | 10 | 1.35401        | .42817          |
| MMOPost          | 39.8000 | 10 | 1.22927        | .38873          |

Pre. In addition, postoperatively of Arthrocentesis p-value < 0.0005

on the clinical examination. For every patient, conventional radiography orthopantomography (OPG) was took to exclude degenerative changes of bony components and for assessment of joint space and relation of condylar head to articular eminence; then if the patient was not responded to pharmacy and splint therapy, we sent him/her for CT scan for more accurate details about Temporomandibular joint. All patients were evaluated for the following parameters preoperatively and one month follow-up after last injection.

*Joint pain:* The patient was asked to quantify the pain subjectively on a visual analog scale (VAS) of 0 to 10, with 0 being no pain and 10 being severe pain.

*Maximum mouth opening:* measured as the distance between the incisal edge of upper and lower central incisors.

*Joint clicking:* Assessed clinically and objectively. Preoperative (present or absent). Postoperative (present or absent).

## RESULTS

The current study showed marked womanly fondness with women ratios of about 90% and manly ratios of about 10%. As in Table 1 and Graph 1.

This study showed the frequency of patient's age, and it's percent, age 18-35 years old with a mean (23.32) as in Table 2.

### Group A:

*Pain (VAS)* level reduced by (mean) from 7.6 pre. – 2.2 postoperatively.

*MMO* improved by (mean) from 35.5 mm pre. – 39.8 mm postoperatively. AS See Table 3.

### Group B

*Pain (VAS)* level reduced by (mean) from 7.4 pre. – 2.8 postoperatively.

*MMO* improved by (mean) from 35.7 mm pre – 38.6 mm postoperatively. AS See Table 4.

### Joint Click

Initially, before any injection, all patients (100%) presented with a joint click (with variable degree); at the end of the follow-up patients were showed significant decreased in joint click in both two groups (As see Graph 1).

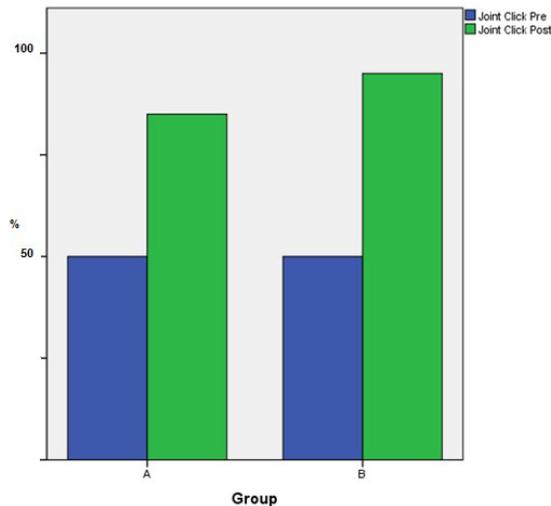
## DISCUSSION

The outcome of gender spreading in the current study presented high liking to lady with a woman ratio around 90% and 10% for a man. This similar to a study using objective assessment approaches of a random sample from the community rather than clinic patients, showed TMD more predominant in ladies

**Table 4:** VAS and MMO pre and post medication use and wearing splint

|        |         | Mean    | N  | Std. deviation | Std. error mean |
|--------|---------|---------|----|----------------|-----------------|
| Pair 1 | VASPre  | 7.4333  | 30 | 1.00630        | .18372          |
|        | VASPost | 2.8667  | 30 | 1.27937        | .23358          |
| Pair 2 | MMOPre  | 35.7667 | 30 | 1.59056        | .29040          |
|        | MMOPost | 38.6667 | 30 | 1.39786        | .25521          |

p-value &gt; 0.0005

**Graph 1:** Improvement of Joint Click in Group A and B.

than men. Females were more likely to find management for their disorder.<sup>8</sup> The mean age was (23 group A) and (23 group B) from 18–35 years old in the current study. This similar with studies that showed confident age groups with more danger for increasing TMD than others. The most age-associated with TMD are 20 and 30 years. The disorder is very rare in males afterward the age of 55 years and is rare in ageing females.<sup>8</sup> The lower prevalence of TMD signs and symptoms in older age groups supports the probability that most TMD are self-limiting.<sup>9</sup> In the past, several patients not recover with medical management (bite dishes, relaxants of muscle, compresses, regime and physical treatment) firstly treated with operating relocation of the disc and mandibular fossa arthroplasty. Arthrocentesis has a middle location between surgical and medical therapy.<sup>10</sup> Simple, low price of procedure and tools with good outcome in treating TMJ dysfunction.<sup>11</sup> Effectiveness in numerous documents are: (Murakami *et al.* 1995)<sup>12</sup> - 70%; (monje *et al.* 2012)<sup>13</sup> - 98% (Schiffman *et al.* 2014)<sup>14</sup> 106 patients with magnetic resonance imaging (MRI-79%; Shi *et al.* 2013)<sup>15</sup> - 75%; (Xu *et al.* 2005)<sup>16</sup> - 95%. All these studies showed that arthrocentesis more effective technique with a highly successful rate. Symptoms of intra articular imbalance and good mandibular actions improve after the procedure, similar to other studies.<sup>17,18</sup> Internal instability is typically connected with public symptoms like pain, incomplete opening of mouth and changed function of mandibular, this describe current consequences. More pain leads to decrease opening of mouth and finally changed actions. So improving one problematic the two other also recover.<sup>18</sup> Decrease the

pain occur by eliminating of inflammation mediators found inside joint,<sup>19</sup> eliminating intra-articular devotions lead to increasing mandibular movement,<sup>10</sup> improving disc and fossa space by eliminating the negative pressure inside the joint,<sup>20</sup> decreases the mechanical obstacle caused by the anterior disc location lead to refining disc movement<sup>21</sup> the TMJ. Maximal broadly used management for TMD is occlusal splint use to decrease pain about 70%, and pain occur in muscles due to high muscles used about 85%.<sup>22</sup> Nonsurgical method has long-term effects for patients with internal derangement.<sup>23</sup> As soon as possible, use splint after symptom occurs leads to increased chance of good recovery.<sup>24</sup> Physical management and occlusal splint is very excellent traditional replacements therapy with 90% successful rate.<sup>25</sup> Also occlusal splint decrease headache and muscle pain, but little effect on pain occurs in TMJ dislocation.<sup>26</sup>

**Aim, and Objectives:** Diagnosis of TMJ. Rendering to Conti *et al.*,<sup>27</sup> controlled randomized clinical trial. Methods. The authors randomly assigned 57 people with signs of disk displacement and TMJ pain into three groups according to the type of splint: bilateral balanced, canine guidance and nonoccluding. The authors followed the groups for six months using analysis of a VAS occlusal immobilize had no benefit in handling disc displacement without decline. So conservative management of TMD not have good results in some patients. Surgical procedures include arthrocentesis, arthroscopy, discectomy, and insertion of an implant. Arthrocentesis used by numerous investigators as a management choice with good results. The mixture of arthrocentesis and splint stabilization of TMD can facilitate max. mouth opening and less pain suffering, this maneuver can lead to decreasing the patient's distress in a smaller period and successful the patient's class of life.<sup>28</sup> Arthrocentesis of the temporomandibular joint is used not only in cases of acute closed lock but also in the treatment of various temporomandibular disorders. The most frequent indication is acute anterior displacement of the articular disc without reduction. Treatment using occlusal splint is one of the most frequently used methods of conservative treatment. It is used mainly in the case of discopathies and myofascial pain. Aim. The aim of the study was to confirm that simultaneous use of the occlusal splint and arthrocentesis makes the treatment more effective in the case of detected disc dislocation without reduction.

**Materials, Methods and Results:** From 2008 to 2013, 144 patients underwent arthrocentesis simultaneously using occlusal splint in the treatment of chronic closed lock. The study group consisted of a 130 (90.3%).

**CONCLUSION**

Using 0.9% normal saline solution and betamethasone injection with occlusal splint have satisfying benefits, ease, security, patient's approval of injection procedure, and absence of important adverse effects and problems.

**REFERENCES**

- Alomar X, Medrano J, Cabratosa J, Clavero JA, Lorente M, Serra I, *et al.* Anatomy of the Temporomandibular Joint. *Semin Ultrasound, CT MRI.* 2007; 28, 170–183.
- Ingawalé S, Goswami T. Temporomandibular joint: Disorders, treatments, and biomechanics. *Ann Biomed Eng.* 2009; 37, 976–996.
- Ackland D, Robinson D, Lee PVS, Dimitroulis G. Design and clinical outcome of a novel 3D-printed prosthetic joint replacement for the human temporomandibular joint. *Clin Biomech.* 2018; 37, 976–996.
- Tanaka E, Detamore MS, Mercuri LG. Degenerative disorders of the Temporomandibular joint: etiology, diagnosis, and treatment. *Journal of Dental Research.* 2008. 87, 296–307.
- Al-Ani MZ, Davies SJ, Gray RJM, Sloan P, Glennly AM. Stabilisation splint therapy for temporomandibular pain dysfunction syndrome. *Cochrane Database of Systematic Reviews* 2016, Issue 1. Art. No.: CD002778.
- AlHadidi A, Cevidanes LHS, Mol A, Ludlow J, Styner M. Comparison of two methods for quantitative assessment of mandibular asymmetry using cone beam computed tomography image volumes. *Dentomaxillofacial Radiol.* 2011; 40, 351–357.
- Jacobson A. *Handbook of orthodontics.* Am J Orthod Dentofac Orthop. 2010; 138, 527.
- Gulati M, Anand V, Jain N, Anand B, Bahuguna R, Govila V, *et al.* Essentials of periodontal medicine in preventive medicine. *International Journal of Preventive Medicine.* 2013. 4, 988–994.
- González-García R. The Current Role and the Future of Minimally Invasive Temporomandibular Joint Surgery. *Oral and Maxillofacial Surgery Clinics of North America.* 2015 27, 69–84.
- Ferreira LA, Grossmann E, Januzzi E, de Paula MVQ, Carvalho ACP. Diagnosis of temporomandibular joint disorders: Indication of imaging exams. *Brazilian Journal of Otorhinolaryngology.* 2016. 82, 341–352.
- Shaffer SM, Brismée JM, Sizer PS, Courtney CA. Temporomandibular disorders. Part 2: Conservative management. *J Man Manip Ther.* 2014; 22, 13–23.
- Murakami KI, Hosaka H, Moriya Y, Segami N, Iizuka T. Short-term treatment outcome study for the management of temporomandibular joint closed lock. A comparison of arthrocentesis to nonsurgical therapy and arthroscopic lysis and lavage. *Oral Surgery, Oral Med Oral Pathol Oral Radiol.* 1995; 80, 253–257.
- Monje-Gil F, Nitzan D, González-García R. Temporomandibular joint arthrocentesis. Review of the literature. *Medicina Oral, Patología Oral y Cirugía Bucal.* 2012. 17.
- Schiffman EL, Velly AM, Look JO, Hodges JS, Swift JQ, Decker KL, *et al.* Effects of four treatment strategies for temporomandibular joint closed lock. *Int J Oral Maxillofac Surg.* 2014; 43, 217–226.
- Shi Z, Guo C, Awad M. Hyaluronate for temporomandibular joint disorders. *Cochrane Database Syst Rev.* 2003;(1):CD002970. Update in: *Cochrane Database Syst Rev.* 2013;10:CD002970.
- Xu Y, Zhang Z guang, Zheng Y hua. Measurement and analysis of the intra-articular pressure in temporomandibular joint with sudden-onset, severe closed lock. *Hua Xi Kou Qiang Yi Xue Za Zhi.* 2005; 23, 41–42.
- Guo C, Shi Z, Revington P. Arthrocentesis and lavage for treating temporomandibular joint disorders. *Cochrane Database of Systematic Reviews.* 2015. 16 Dec.
- Vasconcelos BCDE, Bessa-Nogueira RV, Rocha NS. Temporomandibular joint arthrocentesis: Evaluation of results and review of the literature. *Braz J Otorhinolaryngol.* 2006; 72, 634–638.
- Peravali RK, Bhat HHK, Reddy S. Maxillo-Mandibular Cemento-ossifying Fibroma: A Rare Case Report. *J Maxillofac Oral Surg.* 2015; 14, 300–307.
- Motta A, Louro RS, Medeiros PJDA, Capelli J. Orthodontic and surgical treatment of a patient with an ankylosed temporomandibular joint. *Am J Orthod Dentofac Orthop.* 2007; 131, 785–796.
- Laskin DM. Arthroscopy Versus Arthrocentesis for Treating Internal Derangements of the Temporomandibular Joint. *Oral Maxillofac Surg Clin North Am.* 2018 Aug;30(3):325-328.
- Peck CC, Goulet JP, Lobbezoo F, Schiffman EL, Alstergren P, Anderson GC, *et al.* Expanding the taxonomy of the diagnostic criteria for temporomandibular disorders. *J Oral Rehabil.* 2014; 41,2-23.
- He D, Yang C, Chen M, Yang X, Li L. Effects of soft tissue injury to the temporomandibular joint: Report of 8 cases. *Br J Oral Maxillofac Surg.* 2013; 51, 58–62.
- Emshoff R. Clinical factors affecting the outcome of occlusal splint therapy of temporomandibular joint disorders. *J Oral Rehabil.* 2006; 33, 393–401.
- Yoda T, Sakamoto I, Imai H, Ohashi K, Hoshi K, Kusama M, *et al.* Response of temporomandibular joint intermittent closed lock to different treatment modalities: A multicenter survey. *Cranio.* 2006. 24, 130–136.
- Devi J, Verma M, Gupta R. Assessment of treatment response to splint therapy and evaluation of TMJ function using joint vibration analysis in patients exhibiting TMJ disc displacement with reduction: A clinical study. *Indian J Dent Res.* 2017;28:33–43.
- Conti PCR, Dos Santos CN, Kogawa EM, Conti ACDCF, De Araujo CDRP. The treatment of painful temporomandibular joint clicking with oral splints: A randomized clinical trial. *J Am Dent Assoc.* 2006; 137, 1108–1114.
- Tvrđy P, Heinz P, Zapletalova J, Pink R, Michl P. Effect of combination therapy of arthrocentesis and occlusal splint on nonreducing temporomandibular joint disk displacement. *Biomed Pap.* 2015; 159, 677–680.