

TMJ Disorders Treated with Conservative Treatment (Medicines and Physiotherapy) and Arthrocentesis: A Comparative Study

Abdalelah Mohammad Almomani¹, Mohammad Fares Khalaf Aljariri²,

Loay E'layan Hammoud Alhammad³, Mohammad Issa Abdel Karim Alqatawna⁴,

Abdallah Mohammad Hamed⁵

Abstract: Joints are covered with ligaments and muscles, which give the joint its strength, and its range of motion, with no pain during its normal activity. The temporomandibular joint (TMJ) connects the mandible with the rest of the head parts. The TMJ plays an important role in the opening and the closure of the oral cavity. Any decrease in the maximal opening of mouth (MMO) may interfere with its basic life activities like eating, drinking, breathing, and speech. The patient who has a temporomandibular disorder (TMD) may exhibit some manifestations like pain and swelling around the joint. He may also hear some clicks during the joint movement, either unilateral or bilateral. To help the patient to overcome these complaints, the treatment protocol starts through the clinical assessment of the joint to determine what the severity and the extent of the problem, and the expected causes. The treatment protocol starts with the conservative treatment (a combination of nonsurgical interventions like medicines and physiotherapy), and may end with arthrocentesis and surgery if needed. In the conservative treatment, medicines like analgesia are prescribed to relax the joint, and antibiotics are to treat infections if needed. Life style instructions to the patient are very important like how to act with daily activities, and how to decrease any strong activities around the joint muscles. Arthrocentesis can be performed after two weeks if the conservative treatment was not helpful. Arthrocentesis is a simple procedure that can be performed in the clinic in order to decompress the affected TMJ. It is called the "lavage" of the joint, which involves 1 or two needle insertions in the joint, a washing fluid is administered, and then the fluid is aspirated. The irrigated fluid is to wash out the inflammatory mediators will be washed out, and the pain is expected to decrease. **Methodology:** In this research, we followed a Cross-sectional design, quasi experimental a time series with withdrawn and reinstated treatment. A random selection of 100 patients who had visited the maxillofacial clinic and their chief complaint was the decrease in MMO and pain in TMJ. **Results:** The follow of the conservative treatment was helpful with (67%) success (n=100, (p=0.05)), and (33%) needed to perform arthrocentesis with 85% success (n=33, (p=0.05)). Only (5%) of the patients (n=100, (p=0.05)) didn't respond to both treatments; the conservative and arthrocentesis, and they needed further investigations.

1. Introduction

TMD is defined as a number of clinical problems that may affect the masticatory muscle complex, the temporomandibular joint (TMJ) and associated structures. The temporomandibular disorder (TMD) is a very common problem which is affecting up to 33% of individuals within their lifetime. (Ouanounou A, Goldberg M, Haas DA.) TMD is one of the most common disorders in the maxillofacial region (Gauer, R., & Semidey, M. J. (2015)). When the patient who has TMD visits the dental clinic, a clinical exam for the patient will be done. According to the physical exam, the treatment plan in the maxillofacial clinic will be in many disciplines which may include the conservative (non-surgical), and arthrocentesis (the surgical treatment). The most common complaint that the TMD patient may exhibit is pain around TMJ area, and he may have a decrease in maximal mouth opening (MMO). There are some other signs like clicking in the joint, or swelling. The leading causes to TMD are many, like infection and trauma. In this study, we selected the non-traumatic patients who had a unilateral pain in his mouth.

The conservative treatment

The conservative treatment is well-defined as the treatment to prevent the condition not to deteriorate, through a natural healing (Oxford Reference). The treatment strategies for TMD in the conservative treatment may include medical management (education, counseling, self-help, and

NSAIDs); and rehabilitation (physical therapy, and cognitive-behavioral therapy). The treatment strategies were found effective, with low cost, so it should be explored to the patient first. (Wright, E. F., & North, S. L. (2009)). The synchronization of the conservative treatment strategies is very important, which may save time, and it can help to patient to adapt with his daily life activities. The reevaluation of the patient can be in two to four weeks (Wright, E. F., & North, S. L. (2009)). The patient should restrict to the instructions the conservative treatment. If not, the patient's condition may worsen, and he may need to perform arthrocentesis. Arthrocentesis is a minimally invasive procedure. (Wright, E. F., & North, S. L. (2009)). It is considered as a simple procedure that can be performed in the dental clinic or in the theatre under local anesthesia. The aim of this procedure is to decompress the affected TMJ. The release of this pressure is to enhance the movement of the joint, and to get rid of the inflammatory mediators and crystals that may be found in the synovial fluid in the joint. In general, the efficacy of arthrocentesis can be measured through the increase of the limited maximal mouth opening (MMO), and the decrease in pain in TMJ (visual analogue scale (VAS)). (De Riu, G., Stimolo, M., Meloni, S. M., Soma, D., Pisano, M., Sembronio, S., & Tullio, A. (2013)). The maximal opening of the mouth can be measured in millimeters. And gradually by time, and through the proper treatment, the maximal opening of the mouth will increase. (Malik, A. H., & Shah, A. A. (2014)). The patient satisfaction about the conservative treatment and

arthrocentesis is very important, One of the studies mentioned that after one year, the patient satisfaction about their mouth opening was 42.9% agreed that there was an improvement, and 35% completely agreed. (Malik, A. H., & Shah, A. A. (2014).)

TMD assessment criteria

The criterion which is used to determine the success of either the conservative treatment or arthrocentesis has two main indicators: The maximal mouth opening (MMO), and visual analogue scale (VAS). MMO is defined as "the greatest distance between the incisal edge of the maxillary central

incisors to the incisal edge of the mandibular central incisors at the midline when the mouth is open as wide as possible." (GOUVEIA, Mariana Vasconcelos da Cruz et al.). The normal MMO in adults is approximately 35 to 45 mm. On the other hand, visual analogue scale is (VAS) "consists of a straight line with the endpoints defining extreme limits such as 'no pain at all' and 'pain as bad as it could be. The patient is asked to mark his pain level on the line between the two endpoints. The distance between 'no pain at all' and the mark then defines the subject's pain". (Al-Dlaigan, Y. H., & Asiry, M. A. (2014).)



Figure 1: Represents the measurement of mandibular joint. The increase of this measurement readings means that there is effectiveness in the treatment in TMJ disorders. (Wright, E. F., & North, S. L. (2009).)

2. Methodology

This study is to conduct the comparison of different disciplines of TMJ treatment (conservative treatment and arthrocentesis), through how much the TMJ is improved in each discipline, and the disappearance of TMD manifestations. In our study, the criterion for the patient improvement is through the measurement of the mentioned 2 indicators: MMO and VAS criterion. Data collection was through a Cross-sectional design, quasi experimental a time series with withdrawn and reinstated treatment, of 100 patients who had TMD. These patients were selected randomly, and it was the first visit of them to the maxillofacial Clinic in Prince Zaid Bin Alhussain Military Hospital, Altafilah, Jordan. Educational level, marital status, economical status, and the health status were ignored in this study and they were considered as non-relevant factors. The age of the patients varied from 15 years old to 65 (age mean was 37.3 years). The time series for each patient was divided in two phases starting from the 0 day (the day of the first visit). The first phase lasted for 2 weeks, and the second one was at the 7th day after performing arthrocentesis. These phases were divided per protocol, and a table was

established for each patient. The measurements of MMO and VAS were documented at the 0 day, and at the 14th day. Both indicators (MMO and VAS) should be within normal limits. The suggested normal reading of MMO was ≥ 35 mm. and VAS reading should be ≤ 3 .

3. Results

The number of the patients was (100), (64) were females (64%) and (36) males (36%). Prior to the conservative treatment, the MMO average for all of the patients was (26.8) mm, and MMO standard deviation was (4.96). The VAS average was (6.5), and the VAS standard deviation was (1.81). After 2 weeks of conservative treatment, (67) patients responded properly to the conservative treatment, and they met the treatment goals ($VAS \leq 3$, $MMO \geq 35$ mm). After conservative treatment the MMO average was (36.5) mm, and MMO standard deviation was (7.02). The VAS average was (3.0), and the VAS standard deviation was (1.97).

The patients who didn't meet the criteria of conservative treatment improvement were referred to do arthrocentesis.

After the performance of TMJ arthrocentesis, (28) patients had met the criteria (VAS ≤ 3 , MMO ≥ 35 mm), and the MMO average was (37.3) mm, and MMO standard deviation was (4.25). The VAS average was (2.39), and the VAS standard deviation was (1.2).

The rest of the patients (5 patients) were given appointments for further interventions rather than conservative treatment or arthrocentesis.

4. Conclusion

In patients who had TMDs, we found that the conservative treatment was effective in 67% of cases, and 28% of the patients needed to go to arthrocentesis. (5%) of the patients didn't improve after the performance of both; the conservative and arthrocentesis treatments, and they needed further plans of treatment.

References

- [1] Conservative treatment. *Oxford Reference*. Retrieved 25 Dec. 2021, from <https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095633226>.
- [2] Gauer, R., & Semidey, M. J. (2015). Diagnosis and treatment of temporomandibular disorders. *American family physician*, 91(6), 378-386.
- [3] Ouanounou A, Goldberg M, Haas DA. Pharmacotherapy in Temporomandibular Disorders: A Review. *J Can Dent Assoc*. 2017 Jul;83:h7. PMID: 29513209.
- [4] Wright, E. F., & North, S. L. (2009). Management and treatment of temporomandibular disorders: a clinical perspective. *The Journal of manual & manipulative therapy*, 17(4), 247-254. <https://doi.org/10.1179/106698109791352184>
- [5] Wright, E. F., & North, S. L. (2009). Management and treatment of temporomandibular disorders: a clinical perspective. *The Journal of manual & manipulative therapy*, 17(4), 247-254. <https://doi.org/10.1179/106698109791352184>
- [6] Wright, E. F., & North, S. L. (2009). Management and treatment of temporomandibular disorders: a clinical perspective. *The Journal of manual & manipulative therapy*, 17(4), 247-254. <https://doi.org/10.1179/106698109791352184>
- [7] De Riu, G., Stimolo, M., Meloni, S. M., Soma, D., Pisano, M., Sembronio, S., & Tullio, A. (2013). Arthrocentesis and temporomandibular joint disorders: clinical and radiological results of a prospective study. *International journal of dentistry*, 2013, 790648. <https://doi.org/10.1155/2013/790648>
- [8] Malik, A. H., & Shah, A. A. (2014). Efficacy of Temporomandibular Joint Arthrocentesis on Mouth Opening and Pain in the Treatment of Internal Derangement of TMJ-A Clinical Study. *Journal of maxillofacial and oral surgery*, 13(3), 244-248. <https://doi.org/10.1007/s12663-013-0522-7>
- [9] Malik, A. H., & Shah, A. A. (2014). Efficacy of Temporomandibular Joint Arthrocentesis on Mouth Opening and Pain in the Treatment of Internal Derangement of TMJ-A Clinical Study. *Journal of maxillofacial and oral surgery*, 13(3), 244-248. <https://doi.org/10.1007/s12663-013-0522-7>
- [10] GOUVEIA, Mariana Vasconcelos da Cruz et al. Effectiveness and satisfaction evaluation of patients submitted to TMJ arthrocentesis: a case series. *Brazilian Oral Research* [online]. 2015, v. 29, n. 1 [Accessed 25 December 2021], pp. 1-5. Available from: <https://doi.org/10.1590/1807-3107BOR-2015.vol29.0050>. Epub 17 Mar 2015. ISSN 1807-3107. <https://doi.org/10.1590/1807-3107BOR-2015.vol29.0050>
- [11] Al-Dlaigan, Y. H., & Asiry, M. A. (2014). Maximum mouth opening in saudi adolescents. *Journal of international oral health : JIOH*, 6(6), 45-49.