REVIEW ARTICLE

Two-Way Syringe Technique for Arthrocentesis- A Literature Review

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ABSTRACT

Temporomandibular joint disorders are one of the most common causes of orofacial pain that does not show any dental origin. These can lead to pain in the masticatory muscles and reduced mouth opening which can affect the daily life of an individual. The treatment includes both non-surgical and surgical methods. When the non-surgical method fails to treat the cause then the surgical method is prepared yet they lead to many risks. Thus a conservative approach to using a syringe was developed. There are two types: single-syringe technique and double- syringe technique. This article aims to review on the use of double-syringe technique, their advantages and limitations over the single syringe technique.

Keywords

Arthrocentesis, Masticatory muscles, Single Syringe, Surgical, Temporomandibular Joint

INTRODUCTION

Temporomandibular disorders (TMD) are disorders causing musculoskeletal pain in the masticatory system, i.e., of the temporomandibular joints (TMJs) and the masticatory muscles. The most frequent non-dental cause of orofacial pain is TMD. They result in joint pain and limited mouth opening, muscle tenderness, and intermittent jointsounds thus having an adverse effect on daily activities and the quality of life. The treatment plan for TMDs includes non-surgical and surgical methods. But the TMD treatments start with a conservative approach withthe main aim to relieve pain and restore normal mouth opening in the individual. Only if the conservative approach is ineffective, then minimally invasive surgical treatment options such as arthrocentesis are considered in order tomaintain and improve the quality of life of the individual. Arthrocentesis is commonly defined asthe 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 [1][2]. Numerous clinical studies have been done using this technique. The present articles provide insightinto the two-way syringe technique to treat TMDs.

REVIEW OF LITERATURE

Two-way syringe technique: In this technique, they insert a needle into the superior joint space

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atthe glenoid fossa and inject a solution to distend the joint space. Then, a second needle is inserted into the area of the articular eminence. Of these two, one of the needles function as an inflow and the other as an outflow [3][4].

This technique was found to be effective either with or without the use of additional medications.There are studies that have proven the same.

S. Comert Kilic and M Gungormus, conducted a randomized clinical trial with the aim to compare the treatment of TMJ osteoarthritis treated with one of the two treatment techniques: arthrocentesis plus Platelet-Rich-Plasma (PRP) and arthrocentesis plus Hyaluronic Acid (HA). Thestudy was conducted on 31 adult patients with 49 osteoarthritic joints. They were randomly divided into two groups, wherein one group was treated with arthrocentesis plus PRP, and the other group with arthrocentesis plus HA. Maximum inter-incisal opening (MIO) measures and visual analogue scale (VAS) assessments were among the outcome variables. Preoperative and 12-month postoperative outcome factors were noted.Statistically, no significant difference was observed between the groups in VAS parameters or MIO measurements. Significant clinical improvements in all VAS indicators and painless MIO were the outcomes of both therapy approaches. This study concluded that arthrocentesis plus HA was more acceptable than PRP [5].

Bergstrand et al.conducted a study to evaluate thelong-term effectiveness of intra-articulartemporomandibular joint arthrocentesis for patients with osteoarthritis and compared arthrocentesis/lavage alone with arthrocentesis/lavage and injected hyaluronic acid. This study was conducted on 37 patients for a period of 4 years. Two groups were randomlyassigned to the patients: one group received arthrocentesis with lavage alone, while the other received arthrocentesis with lavage plus HA. There was no statistically significant difference seen in VAS parameters and MIO. Both methods resulted in significant improvement in pain and jaw function in the long-term [6].

Recently, a modification to this double-syringetechnique has been put to use wherein the saline ispumped into the superior joint compartment when the patient has the mouth open it provides the required pressure to release the joint adherence and the fluid outflow when the patient closes his/ her mouth. The injection/ejection process should performed 10 times for a total amount of 40ml [7].Pasqual et al conducted a comparative study on thesingle-syringe vs double-syringe technique wherein he found that the double-syringe technique has more effective irrigant effusion. This is due to the pressure created in the upper joint space, thus resulting in the effective release of adhesions of chronic inflammation [8].

The double-syringe technique though has the advantage of a shorter duration of the procedure yet they do have its limitations i.e., positioning of the two needles within the joint cavity may cause discomfort to the patients at the time of the first lavage [9].

Thus, the above procedure was modified to a single syringe with a two-way flow of the fluid. This has proved to be advantageous for both the clinician as well as the patient.

The two-way syringe technique, along with its modifications, continues to evolve as a minimally invasive approach for the management of temporomandibular joint (TMJ) disorders. This technique provides significant therapeutic benefits by effectively distending the joint space, breaking adhesions, and facilitating lavage of inflammatory mediators. Over the years, the method has undergone modifications, enhancing its effectiveness and ease of application. Theseadvancements aim to improve patient comfort andreduce procedural complexity, making it a viable option in clinical settings.

The randomized clinical trials conducted by S. Comert Kilic and M. Gungormus, as well as studies by Bergstrand et al., have established the clinical effectiveness of arthrocentesis, whether combined with Platelet-Rich Plasma (PRP) or Hyaluronic Acid (HA). While both approaches demonstrated significant improvements in pain and function, HA emerged as a more favorable option due to its broader acceptance among patients. This highlights the importance of tailoring treatment modalities to individual patient needs, as TMJ osteoarthritis management is not a one-size-fits-all approach. Additionally, the long-term benefits reported in these studies underscore the potential of arthrocentesis techniques in providing sustainable relief.

The recent innovations, such as the modified single-syringe technique with two-way fluid flow, reflect the growing emphasis on reducing patient discomfort and enhancing procedural efficiency. By integrating

continuous fluid inflow and outflow through a single syringe, clinicians can maintain effective lavage with fewer insertion points, minimizing the risk of patient discomfort. This advancement ensures that the procedure is quicker and less invasive, addressing the limitations of the double-syringe technique. Moreover, it allows for precise pressure control during lavage, improving the release of joint adhesions caused by chronic inflammation. This balance between simplicity and efficacy marks a significant step forward in TMJ arthrocentesis techniques.

CONCLUSION

The double syringe technique has paved way for faster treatment for patients with TMJ disorders. Due to their limitations, there are various modifications that have been done to make the procedure painless and effective in treating the disorder. Thus, it can be concluded that arthrocentesis is a simple, non-invasive, cost- effective, and highly effective procedure. This procedure is found to have less complications and more clinical benefits. Thus, treatment options forpatients with TMJ disorders who are not responding to non-surgical therapies.

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