

Original Research

Assessment of role of Arthrocentesis as a savior in TMJ internal derangement

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ABSTRACT:

Background: To evaluate the role of arthrocentesis in TMJ internal derangement. **Materials & methods:** A total of 20 patients with TMJ internal derangement underwent arthrocentesis using saline were enrolled. The patients were assessed for all the parameters pre-operatively, and post-operatively on day 1, 2 weeks and then monthly till 6 months. All results were calculated using the mean value for each of the parameters considered and checked for statistical significance using SPSS software and student paired t test for mouth opening. **Results:** With arthrocentesis 18 (90%) patients showed significant decrease in the level of pain in the follow-up period. The mean of pain score was pre-operatively 5.3. In the post-operative period pain score reduced to 3.8 at 1 week ($P = 0.001$). There was gradual reduction in the mean pain score from pre-operatively 5.3–0.65 till 6 months. **Conclusion:** Arthrocentesis is minimally invasive procedure with less risk of complications in patients with TMJ internal derangement.

Keywords: TMJ, internal derangement, arthrocentesis.

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INTRODUCTION

Temporomandibular joint (TMJ) disorders are the main cause of chronic facial pain and disability. The prevalence of clinically significant TMJ related jaw pain is 5% of the general population. Approximately 2% of the general population seeks treatment for TMJ-related symptoms.¹ TMJ with internal derangement is one of the common intra-articular disorder. It has always presented a therapeutic challenge to the oral and maxillofacial surgeons. The disorder has been associated with characteristic clinical findings such as pain, joint sounds and irregular or deviating jaw function.²

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. TMJ internal derangement has always presented as therapeutic challenge to the maxillofacial surgeons. Up to 25% of the entire population has internal derangement of TMJ and usually they are treated with nonsurgical methods such as medications, physiotherapy and occlusal splints in the initial period.³ When these methods are unsuccessful, they are often managed by surgical methods. The mainstay of surgical treatment is based on changing the morphology or position of the disc, or removal of the disc with or without replacement. There are variable reports of success with the open surgical methodologies and are associated with surgical risks and potential long term sequelae.⁴ Arthrocentesis with joint lavage is the simplest form of surgical intervention and is suggested to be used as an initial procedure in the surgical algorithm.^{5,6} It is a minimally invasive procedure which reduces pain, joint sounds and improves mouth opening. It works on the principle that it could loosen adherent disc, remove inflammatory content and pain-mediators allowing nutrient perfusion and thereby free sliding

movement of the disc.^{7,8} Hence, this study was conducted to evaluate the role of arthrocentesis in TMJ internal derangement.

MATERIALS & METHODS

A total of 20 patients with TMJ internal derangement underwent arthrocentesis using saline were enrolled. Pain using visual analog scale, maximum mouth opening, joint noises and mandible deviation were documented pre-operatively and post-operatively. Patients were followed for 6 months. The pre-operative and post-operative clinical assessment was done for signs and symptoms of TMJ disorders which included pain, mouth opening and jaw deviation. Pain was assessed using a visual analog scale (0–10). Mouth opening was measured as the maximum interincisal distance in millimeters using a scale. The patients were assessed for all the parameters pre-operatively, and post-operatively on day 1, 2 weeks and then monthly till 6 months. All results were calculated using the mean value for each of the parameters considered and checked for statistical significance using SPSS software and students paired t test for mouth opening.

RESULTS

A total of 20 subjects were enrolled. Pre-operatively 18 patients complained of pain and 2 of them with closed lock did not have pain. With arthrocentesis 18 (90%) patients showed significant decrease in the level of pain in the follow-up period. The mean of pain score was pre-operatively 5.3. In the post-operative period pain score reduced to 3.8 at 1 week (P = 0.001). There was gradual reduction in the mean pain score from pre-operatively 5.3–0.65 till 6 months.

Table 1: comparison of pre-treatment and post-treatment degree of pain

P e r i o d	Mean	p- value
Pre – operative	5 . 3	0 . 0 0 1
After 6 months	0 . 6 5	

The mean maximum mouth opening(MMO) pre-operatively was 30.5 mm and increased to 37mm immediately following arthrocentesis which increased by 0.5–1 mm at every month followup with mean MMO of 40 mm at 6 months.

Table 2: Comparison of pre-treatment and post-treatment mouth opening

P e r i o d	Mean	p- value
Pre – operative	3 0 . 5	0 . 0 0 1
After 6 months	4 0	

DISCUSSION

The presence of inflammatory cells and inflammatory mediators, including arachidonic acid metabolites and cytokines were demonstrated in symptomatic TMJs.^{9,10} Lavage of the upper joint space reduces pain by removing inflammatory mediators from the joint, increasing mandibular mobility by removing intra-articular adhesions, eliminating the negative pressure

within the joint, recovering disc and fossa space and improving disc mobility, which reduces the mechanical obstruction caused by the anterior position of disc.^{11,12} Arthrocentesis has developed as a natural consequence of the success of arthroscopic lavage and lysis for the treatment of internal derangements.¹³ Arthrocentesis is described as the simplest form of surgery in the TMJ, aiming to release the articular disc and to remove adhesions between the disc surface and the mandibular fossa by means of hydraulic pressure from irrigation of the upper chamber of the TMJ.^{11,14} Hence, this study was conducted to evaluate the role of arthrocentesis in TMJ internal derangement.

In the present study, a total of 20 subjects were enrolled. Pre-operatively 18 patients complained of pain and 2 of them with closed lock did not have pain. With arthrocentesis 18 (90%) patients showed significant decrease in the level of pain in the follow-up period. The mean of pain score was pre-operatively 5.3. In the post-operative period pain score reduced to 3.8 at 1 week (P = 0.001). There was gradual reduction in the mean pain score from pre-operatively 5.3–0.65 till 6 months. A study by Neeli SA et al, studied thirty patients with TMJ internal derangement underwent arthrocentesis using saline. Pain using visual analog scale, maximum mouth opening, joint noises and mandible deviation were documented pre-operatively and post-operatively. Patients were followed for 1 year. The mean pre-operative pain was 4.8 ± 2.65 and post-operatively at 1 year was 0.27 ± 0.45 with an average decrease of 4.72 (P = 0.000). The mean maximal mouth opening pre-operatively was 29.8 ± 2.35 mm and post-operatively 41.9 ± 2.48 mm at 1 year. The mean increase in the mouth opening was 12.1 ± 3.0 mm (P = 0.000).¹⁵

In the present study, the mean maximum mouth opening(MMO) pre-operatively was 30.5 mm and increased to 37mm immediately following arthrocentesis which increased by 0.5–1 mm at every month followup with mean MMO of 40 mm at 6 months. Another study by Kuruvilla VE et al, studied eleven patients and clinically diagnosed to have Internal Derangement of the TMJ underwent arthrocentesis. Patients were evaluated at the end of 1 week, 1 and 3 months and results tabulated. 11 patients with clinically diagnosed Internal Derangement underwent Arthrocentesis and were followed up for 3 months. There was significant improvement in Pain, Maximum Mouth Opening and Clicking/Creptation. All the results were statistically significant. There was no serious post operative complication.¹⁶ Arthrocentesis was useful for management of patients with continuing pain in TMJ unresponsive to conservative management, anterior disc displacement with and without reduction and associated osteoarthritis and rheumatoid arthritis.¹⁷⁻¹⁹ Although originally suggested for the treatment of painful limited mouth opening caused by TMJ derangement of acute onset, it is now widely used in

the treatment of various ID as well as for diagnostic purpose.^{18,20}

CONCLUSION

Arthrocentesis is minimally invasive procedure with less risk of complications in patients with TMJ internal derangement.

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