EFFICACY OF TMJ ARTHROCENTESIS IN TEMPOROMANDIBULAR JOINT DISORDERS

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ABSTRACT

Objective: *The purpose of this study was to determine the efficacy of the Arthrocentesis in Temporomandibular joints disorders in terms of pain reduction and trismus.*

Materials and Methods: *A total of 30 patients was randomly selected from the department of oral and Maxillofacial Surgery, Bacha Khan Medical Complex, Gajju Khan Medical College, Swabi. Age more than 25 years, with Joint noise, mouth opening less than 35mm, Pain at TMJ, patients having conservative treatment failed were included. Patients having systemic involvement, with previous intervention, joint infection, previous and trauma were excluded. Joint lavage was done under local anesthesia, and Arthrocentesis was performed. Data were analyzed by SPSS 20.0. Wilcoxon signed ranks test was applied to compare pain and mouth opening between the preoperative and postoperative periods. P≤0.05 was considered significant.*

Results: *Of total 30 sample n=11(36.7%) were males and n=19(63.3%) were females. The mean age was 36.03±7.604 years, with a range of 25-50 years. The overall mean pain score on the visual analog scale (VAS) decreased from the preoperative period (6.9±2.295) to after one week (2.267± 0.98) and at 3rd month (0.8±0.847) after Arthrocentesis. The overall mean mouth opening increased form preoperative period (31.03±8.206 mm) to after one week (42.1±5.346 mm) and in 3rd month (42.13±5.316 mm) after Arthrocentesis. The reduction in mean pain on VAS at 7th day and 3rd month were very highly statistically significant (P<0.001). The increase in mouth opening at 7th day and 3rd month were very highly statistically significant (P<0.001). There was no difference between males and females. In both genders, the decrease in pain and mouth opening was statistically significant (P<0.00).*

Conclusion: *Arthrocentesis is a minimally invasive surgical procedure for the management of Temporomandibular joint disorders with an excellent improvement of mouth opening and reducing pain.*

Keywords: *Arthrocentesis, Temporomandibular joint, Pain, Mouth opening*

INTRODUCTION

Temporomandibular joint disorders (TMDs) are clinically significant disease with debilitating symptoms of pain, limitation of mouth opening and joint noises, jaw deviation, headaches, and facial pain. Literature reveals that about 75% of the patients in their adulthood have at least one sign of TMDs, and 5% of these patients require treatment.[1] These groups of disorders affect the osseous joint, muscles of mastication, and even both. Anxiety, depression and other

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psychological and somatosensory disturbances have been implicated as initiating and etiological factors.[2]

Many of these patients sought the treatment very late due to early nonspecific initial symptoms. They referred very late to the specialist after the chronic changes in the TMJ has been occurred. Limitations of the mouth opening, clicking joint, constant pain are the few symptoms for which patients seek the treatment.[3] TMJ synovial fluid consists of hyaluronic acid, which reduces the friction. By persisting high loading of TMJ causes the reperfusion hypoxia which produces the free radicals and degrades the hyaluronic acid.[4]

Detailed history, physical examination, laboratory investigation, and imaging may be helpful for the diagnosis. Imaging includes radiography, arthrography, isotope studies, CT scan, and MRI. Aims of the treatment include reduction of pain and improving the function of TMJ and slowing the developing consequences.[1] Treatment of TMDs varies from conservative to open joint surgery. Conventional therapies include soft diet, jaw exercises, non-steroidal anti-inflammatory drugs (NSAIDs), splint therapy, and occlusal stabilization.[1,2]

Arthrocentesis has widely used treatment for TMJ disorders in which fluid is aspirated from the superior joint cavity, and therapeutic medications are injected. This procedure not only washes out inflammatory mediators but also causes arthroscopic lysis and reposition of the disc by the hydraulic pressure of fluid injected to establish the normal positional anatomy and maximal mouth opening. 5-7Complications after arthrocentesis of TMJ may be a preauricular hematoma, facial nerve palsy, bradycardia, intracranial bleeding, lingual nerve damage, dizziness and hearing problems.[8,9]

There is scarce of local literature to determine the efficacy of the Arthrocentesis in TMDs. So the purpose of the present study was to assess the effectiveness of TMJ arthrocentesis in reducing pain and trismus.

MATERIALS AND METHODS

The patients were selected randomly on an outdoor basis at the Department of Oral and Maxillofacial surgery, Bacha Khan Medical Complex/ Gajju Khan Medical College, Swabi. After taking ethical approval from the hospital committee in this randomized clinical trial. Participants with age more than 25 years, joint noise, mouth opening less than 35mm, pain at TMJ, conservative treatment failed, and both sexes were included. Patients having systemic involvement, age more than 60 years, previous intervention, coagulopathies, joint infection, and trauma were excluded.

Thirty patients fulfilling the inclusion criteria were selected, consisting of 19 females and 11 males. A complete history was taken as chief complaint, past medical and surgical history, and drug history. Verbal informed consent was sought and clinical examination was done. Inter incisal mouth opening was measured from incisal tips of upper and lower incisors. The pain was evaluated by a visual analog scale (VAS), which was graded as 10 with severe pain, and 0 with no pain.

Preauricular skin is prepared with an antiseptic solution (Povidone). The patient was counseled for the procedure. Local anesthesia consisting of lidocaine with 1:100000 of adrenaline given for auriculotemporal nerve block and line were drawn from lateral canthus to mid tragus (Holmlund–Hellsing Line). Eighteen gauge needle was inserted at 10 mm from mid of tragus and 2 mm below this line called point A. Three millimeters of ringer lactate solution was injected at this point. Another needle was inserted farther 10mm away from point A, and 10 mm below the Hellsing line, called Point B. Needle at point A was connected to 30cc syringe, and the joint was washed with a total of 200 ml ringer's solution, outflow provided by point B needle. A pressure dressing was done and was asked for active physiotherapy. Patients were followed for one week and three months.

Data were analyzed in SPSS 20.0. Mean, and the standard deviation was calculated for age, mouth opening, and pain score. Frequency and percentage were calculated for gender. Wilcoxon signed ranks test was applied to compare pain and mouth opening between the preoperative and postoperative periods. $P \leq 0.05$ was considered significant.

RESULTS

Of total 30 sample n=11(36.7%) were males and n=19(63.3%) were females. The mean age was 36.03±7.604 years, with a range of 25-50 years. The overall mean pain score on VAS decreased from the preoperative period (6.9±2.295) to after one week (2.267± 0.98) and at 3rd month (0.8±0.847) after Arthrocentesis. The overall mean mouth opening increased form preoperative period (31.03±8.206 mm) to after one week (42.1±5.346 mm) and in 3rd month (42.13±5.316 mm) after Arthrocentesis. (Table 1)

The reduction in mean pain on VAS at 7th day and 3rd month were very highly statistically significant (P<0.001). The details are given in table 2. The increase in mouth opening at 7th day and 3rd month were very highly statistically significant (P<0.001). The details are given in table 3.

There was no difference between males and females. In both genders, the decrease in pain and an increase in mouth opening was statistically significant (P<0.00). The details are given in table 4.

DISCUSSION

TMJ arthrocentesis is a minimally invasive surgical procedure for the internal joint derangements of TMJ. The inflammatory mediators wash away, thereby reducing the overall inflammation and also changes in the pressure inside the TMJ, which causes the release of adhesions inside the joint. Due to the microtrauma leads to reperfusion hypoxia, free radical formation, and degrade, the hyaluronic acid reduces the overall synovial fluid, which ultimately leads to damage to articular surfaces.[7]

In our study total of 30 patients participated in the study with 63.3% females, and 36.7% were males, which in agreement with a high prevalence of TMDs in females being 1.5 to 2 times higher than males.[10] Age range was from 25 to 50 years with a mean age of 36.03±7.604 years, which was also in agreement with literature.[11] The female gender being more susceptible to TMDs suggests that there

Table 1: Mean and standard deviation of overall age, pain, and mouth opening

Variable	**Mean ± SD**	**Range**
Age(years)	36.03±7.604	25-50
Preopt. Pain on VAS	6.9±2.295	4-10
Pain at 7th day	2.267± 0.98	1-4
Pain at 3rd month	0.8±0.847	0-2
Preopt mouth opening (mm)	31.03±8.206	22-47
Mouth opening at 7th (mm)	42.1±5.346	33-50
Mouth Opening at 3rd month (mm)	42.13±5.316	33-50

Table 2: Comparison of pain at preoperative, on 7th day and 3rd month

Pain	**Mean**	**Std. Deviation**	**P-value**
Preopt Pain on VAS	6.9	2.29	0.000
Pain at 7th day	2.27	0.98	
Preopt Pain on VAS	6.9	2.29	0.000
Pain at 3rd month	0.8	0.85	

*Wilcoxon Signed Ranks Test

Table 3: Comparison of mouth opening at preoperative, at 7th day and 3rd month

Mouth opening	**Mean**	**Std. Deviation**	**P-value**
Preopt mouth opening	31.03	8.21	0.000
Mouth opening at 7th day	42.1	5.35	
Preopt mouth opening	31.03	8.21	0.000
Mouth Opening at 3rd month	42.13	5.32	

*Wilcoxon Signed Ranks Test

Table 4: Comparison of pain and mouth opening at preoperative, at 7th day and 3rd month in both genders

Gender		Mean	Std. Deviation	P-value
Male	Preopt Pain on VAS	6.91	2.55	.005
	Pain at 7th day	2.36	1.03	
	Preopt Pain on VAS	6.91	2.55	.003
	Pain at 3r month	0.73	0.9	
	Preopt mouth opening	29.4	6.89	.003
	Mouth opening at 7days	41.5	5.82	
	Preopt mouth opening	29.4	6.89	.003
	Mouth Opening at 3rd month	41.6	5.89	
Female	Preopt Pain on VAS	6.89	2.21	.000
	Pain at 7days	2.21	0.98	
	Preopt Pain on VAS	6.89	2.21	.002
	Pain at 3rd month	0.84	0.83	
	Preopt mouth opening	32	8.91	.000
	Mouth opening at 7days	42.4	5.19	
	Preopt mouth opening	32	8.91	.002
	Mouth Opening at 3rd month	42.4	5.1	

*Wilcoxon Signed Ranks Test

is a close link between female hormones and the receptors in TMJ. It is recommended that TMJ has numerous estrogen receptors which is very much responsive to female reproductive hormones such as estrogen.[12]

Various studies have been conducted that have shown the efficacy of the arthrocentesis in TMDs with good improvement in mouth opening and reduction of pain. In our study, there was a good improvement in mouth opening with mean improvement from (31.03±8.206 mm) to after one week (42.1±5.346 mm) and at 3rd month (42.13±5.316 mm) after Arthrocentesis with a statistically significant difference. Literature also has shown a considerable increase in mouth opening after TMJ arthrocentesis.[13,14]

Arthrocentesis has shown to decrease the pain after arthrocentesis intervention. In a review of the literature, Arthrocentesis as effective in reducing the pain after arthrocentesis intervention. Our findings are in agreement with previous studies with a mean decrease in pain as shown by VAS scale with a mean reduction to 2.27 and 0.8 at 7th day and after two months respectively with a success rate of more than 91%.[15, 16]

The study we conducted a total of 30 patients were selected, and all the procedure were done under local anesthesia. Patients were cautioned about postoperative sequelae. Joint lavage was done with a total of 200 ml of ringer's solution, and patients were followed at 7th-day 3rd month. In the study conducted by Nitzan et al.[15], the procedure was done under local anesthesia, and a total of 200 ml of solution was used for arthrocentesis.

TMJ arthrocentesis is very successful in treating the intra-articular adhesions just by merely doing joint lavage. This treatment has long term relief of the TMJ and has shown to reduce the dysfunction of the joint and relief of pain. As this procedure in an indirect procedure in Intra joint pathology, biopsy taking and handling the mature adhesion are the few shortcomings that cannot be performed with ease. Postoperative swelling and facial palsy diffusion of the solution into surrounding tissues are some of the few drawbacks with arthrocentesis.[3]

In our study, none of the patients were dropped, and noon of the patients developed postoperative complications. Patients were followed for three months, and there was a significant improvement

in pain and mouth opening, which significantly improved the quality of life of the patients.

CONCLUSION

TMJ arthrocentesis is a minimally invasive surgical procedure with fewer complications and most effective in TMDs, especially in terms of improving mouth opening and decreasing the pain. As with proper patients compliance, this procedure can be done under local anesthesia with proper washing out of inflammatory mediators and lysis of adhesions. We recommend arthrocentesis as the first-line minimal invasive procedure for the management of TMDs.

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