

EFFICACY OF TMJ ARTHROCENTESIS IN TEMPOROMANDIBULAR JOINT DISORDERS

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ABSTRACT

Objective: To determine the efficacy of the Temporomandibular joint (TMJ) Arthrocentesis in Temporomandibular joint disorders in term of pain reduction and trimsus.

Material and method: Total of 30 patients were randomly selected from the department of oral and Maxillofacial Surgery, Mayo Hospital Lahore. Patients having age more than 25 years, with Joint noise, mouth opening less than 35mm, Pain at TMJ and having conservative treatment failed were included in the study. Patients having systemic involvement, with previous intervention, previous joint infection and trauma were excluded. Joint lavage was done under local anesthesia and Arthrocentesis was performed. Data was analyzed by SPSS 20.0. Wilcoxon signed ranks test was applied to compare pain and mouth opening between preoperative and postoperative period. $P \leq 0.05$ was considered significant.

Results: A total 30 sample, 36.7% were males and 63.3% were females. The mean age was 36.03 ± 7.604 year with a range of 25-50 years. The overall mean pain score on visual analog scale (VAS) decreased from 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 from preoperative period (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. 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 for males and females. In both genders the decrease in pain and in mouth opening was statistically significant ($P < 0.00$).

Conclusion: Arthrocentesis is a minimal invasive surgical procedure for the management of Temporomandibular joint disorders with 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. Literatures reveal that about 75% of the patients in their adulthood have at least one sign of TMDs and 5% of these of these patients require treatment.¹ These groups of disorders affect osseous joint, muscles of mastication, and even both. Anxiety, depression and other psychological and somato-sensory disturbances have been implicated as initiating and etiological factors.² Many of these patients seek the treatment very late due to early non specific initial symptoms and referred very late to the specialist after the chronic

changes in the TMJ has been occurred. Limitations of the mouth opening, clicking joint, chronic pain are the few symptoms for which patients seek the treatment.³ TMJ synovial fluid consist of hyaluronic acid which reduce the friction. By persist 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 function of TMJ and slowing the developing consequences.¹ Treatment of TMDs varies from conservative to open joint surgery. Conservative treatments include soft diet, jaw exercises, non-steroidal anti-inflammatory drugs (NSAIDs), splint therapy, and occlusal stabilization.^{1,2}

Arthrocentesis is widely used treatment for TMJ disorders in which fluid is aspirated from 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 hydraulic pressure of fluid injected to establish the normal positional anatomy and maximal mouth opening.⁵⁻⁷ Complications after arthrocentesis of TMJ may be preauricular hematoma, facial nerve palsy, bradycardia, intra cranial bleeding, lingual nerve damage, dizziness and hearing problems.^{8,9}

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

MATERIAL AND METHOD:

The patients were selected randomly on the outdoors basis at department of Oral and Maxillofacial surgery Mayo Hospital Lahore after taking ethical approval from hospital committee. 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 19 females and 11 males. Complete history was taken as chief complaint, past medical and surgical history, and drug history. Verbal informed consent was taken and clinical examination was done. Inter incisal mouth opening was measured from incisal edges of upper and lower incisors. Pain was evaluated by Visual analog scale (VAS) which was graded as 10 with severe pain, and 0 with no pain.

Preauricular skin is prepared with anti-septic solution (Povidine). Patients were 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 millimeter of ringer lactate solution was injected at this point. Another needle was inserted farther 10mm away from point A and 10 mm below Hellsing line, called Point B.

Needle at point A was connected to 30cc syringe and joint was washed with total of 200 ml ringer's solution, out flow provided by point B needle. Pressure dressing was done and was asked for active physiotherapy. Patients were followed for one weeks and 3 months.

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

Results:

A total of 30 sample $n=11(36.7\%)$ were males and $n=19(63.3\%)$ were females. The mean age was 36.03 ± 7.604 year with a range of 25-50 years. The overall mean pain score on VAS decreased from 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 from preoperative period (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. (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 the 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 the table 3.

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

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

Variable	Mean \pm 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, at 7th day and at 3rd month

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

*Wilcoxon Signed Ranks Test

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

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

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

Gender		Mean	Std. Deviation	P-value
Male	Preopt Pain on VAS	6.91	2.55	.005
	Pain at 7 th 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

DISCUSSION

TMJ arthrocentesis is a minimally invasive surgical procedure for the internal joint derangements of TMJ. The inflammatory mediators washes away there by reducing the overall inflammation and also changes in the pressure inside the TMJ which cause the release of adhesions inside the joint. Due to the micro trauma 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 time higher than males. 10 Age range was from 25 to 50 years with 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 is a close link between female hormones and the receptors in TMJ. It is suggested that TMJ has numerous estrogen receptors which is very much responsive to female reproductive hormones such as estrogen.¹²

Various studies 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 $(31.03 \pm 8.206$ mm) to after one week $(42.1 \pm 5.346$ mm) and at 3rd month $(42.13 \pm 5.316$ mm) after Arthrocentesis with statistically significant difference. Literature also have shown a significant increase in mouth opening after TMJ arthrocentesis.^{13,14}

Arthrocentesis has shown to decrease the pain after arthrocentic intervention. In review of the literature, Arthrocentesis as much effective in reducing the pain after arthrocentetic intervention. Our findings are in

agreement with previous studies with mean decrease in pain as shown by VAS scale with mean decrease to 2.27 and 0.8 at 7th day and after 2 months respectively with success rate of more than 91%.^{15, 16}

Study we conducted total of 30 patients were selected and all the procedure were done under local anesthesia. Patients were cautioned about post operative sequelae. Joint lavage was done with 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 total of 200 ml of solution was used for arthrocentesis.

TMJ arthrocentesis is very successful in treating the intra-articular adhesions just by simply 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 shortcoming which cannot be performed with ease. Post operative 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 none of the patients developed post operative complications. Patients were followed for 3 months and there was significant improvement in pain and mouth opening which greatly improved the quality of life of the patients.

CONCLUSION:

TMJ arthrocentesis is 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 good patients compliance, this procedure can be done under local anesthesia with good washing out of inflammatory mediators and lysis of adhesions we recommend arthrocentesis as first line minimal invasive procedure for the management of TMDs.

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