

ORIGINAL ARTICLE

To Assess the Outcome of Temporomandibular Joint Arthrocentesis in the Treatment of Internal Derangement of Temporomandibular JointSHOAB ZUBERI¹, ASAD IQBAL², AMMAR AZIM KHAN NIAZI³¹Resident, King Edward Medical University, Mayo hospital Lahore²Senior registrar, SMBB Institute of trauma/ Dow university of Health sciences, Karachi.³Resident, University of Lahore teaching hospital, LahoreCorrespondence to: Asad Iqbal, Email: drasad8@gmail.com, Cell: 03422822019**ABSTRACT**

Background: The two joints connecting the jawbone to the skull are called the temporomandibular joints. The TMJs are another name for these joints (TMJ). It's a connection between the mandible (at the bottom of the skull) and the temporal bone (at the top of the skull). Internal derangement of the temporomandibular joint (TMJ) is a condition in which the disc in the TMJ is displaced out of its normal functional relationship with the mandibular condyle and the articular region of the temporal bone. The problem is within the TMJ, where it can cause serious problems. Pain from an internal condition can be effectively treated with arthrocentesis, or AC (ID).

Objectives: The purpose of this study is to evaluate the effectiveness of arthrocentesis of the temporomandibular joint in the management of temporomandibular joint internal derangement.

Study Design: Descriptive case series.

Setting: Department of Oral and Maxillofacial Surgery, Mayo Hospital, Lahore.

Duration of Study: Six months after approval of synopsis i.e. 22-12-2018 to 22-06-2019

Methodology: 60 Patients matched the inclusion criteria selected from OPD of department of Oral and Maxillofacial Surgery, Mayo hospital Lahore. Informed consent was obtained. Demographic details also obtained. Patients were undergone surgery by senior consultant under LA. After surgery, patients were shifted in post-surgical wards and discharged from there after 48 hours. Patients were advised to present after 1 week of surgery in OPD. After 1 week, patients were evaluated for postoperative maximal mouth opening. Patients were also asked for presence of postoperative pain by using VAS and score was noted (as per operational definition) by researcher himself. All this information was recorded through proforma (attached).

Results: Total of 60 patients, 46.7 % (n=28) were male and 53.3 % (n=32) were female, Mean age of patients was 37.38±15.11. Sixty percent, or n=36, of the patients were found to be between the ages of 18 and 35, and forty percent, or n=24, were found to be between the ages of 36 and 60. Mean duration of TMJ Internal derangement was 49.86±19.12. Mean maximal mouth opening was 35.55±3.51mm. (p-value 0.001) and mean post-operative pain was 2.23±1.06. (P-value 0.001).

Practical Implication: This study will help to understand the effectiveness of arthrocentesis of the temporomandibular joint in the management of temporomandibular joint internal derangement

Conclusion: Finally, we decided that arthrocentesis is a straightforward, minimally invasive treatment. Internally dislocated temporomandibular joints (TMJ) can be corrected with this method. For those who have closed-lock internal derangement, TMJ arthrocentesis appears to be a risk-free alternative with a reduced potential for consequences.

Keywords: Temporomandibular Joint, Arthrocentesis, Post-operative Pain, Derangement, Arthrocentesis, Arthroscopy.

INTRODUCTION

The majority of the time, illnesses like temporomandibular joint (TMJ) disorders are inadequately diagnosed and treated. While TMJ issues aren't immediately life-threatening, they can certainly make day-to-day life more difficult. When the temporomandibular joint isn't functioning properly, it can cause pain and alter one's sense of self-worth. In extreme cases, these problems might make it hard to keep one's emotions in check.^{1,2}

When the articular disc, articular eminence, and condyle are not in their usual positions relative to one another, a condition known as internal derangement of the temporomandibular joint (TMJ) occurs. This may happen while the joint is in rest or while it is being used. Patients may complain of pain or difficulty opening their mouths. Arthrocentesis and arthroscopy are two treatments that can be used to realign the TMJ from the inside. The arthroscopy technique is surgical, while the arthrocentesis operation is performed with a needle.³

Arthrocentesis, a treatment that removes fluid and tissue from inside a joint, has been used to treat TMJ disorders. This procedure is easy and leaves little room for error. Arthrocentesis refers to the process of draining fluid from a joint. One needle is used to withdraw joint fluid from the upper joint region during an arthrocentesis procedure, and a second needle is utilized to flush out the joint space once the first needle has been removed. The TMJ's innate problems can be treated in this way.^{3,4} In modern times, arthrocentesis of the TMJ is utilized to treat not just acute closure lock but also a variety of other issues that are associated with the jaw joint.⁵

One study showed that the mean maximal mouth opening was 33.475±2.872 mm while mean postoperative pain was

2.45±0.88 after 1 week of TMJ arthrocentesis for management of internal derangement of TMJ.⁶ Another study has showed that mean maximal mouth opening was 41.9±2.48mm while mean postoperative pain was 0.27±0.45 with TMJ arthrocentesis for management of internal derangement of TMJ.⁷

The rationale of this study is to assess the outcome of TMJ arthrocentesis in the treatment of internal derangement of TMJ. In literature, it has been reported that arthrocentesis is enough reliable to increase maximal mouth opening nearer to normal mouth opening i.e. 51.3mm on average with less pain for management of internal derangement of TMJ. But in routine, arthrocentesis is not practiced due to non-availability of local evidence. So through this study we want to get local magnitudes and implement the use of TMJ arthrocentesis for TMJ internal derangement. This will help to improve our practice and more successful management protocol to be implemented in future.

MATERIALS AND METHODS

The descriptive case series was carried out by the Oral and Maxillofacial Surgery Division at the Lahore location of the Mayo Clinic. After the abstract was approved, the data gathering process took place over the course of six months. With a confidence level of 95%, a d-value of 1, and the maximum opening of the mouth after TMJ arthrocentesis, the number of cases needed for the sample was calculated to be 60. (33.4752.872 mm). [6]. We did not select our samples in a random method but rather in a sequential order.

Data Collection Procedure: 60 patients matching the inclusion criteria were selected from the OPD of Department of Oral and Maxillofacial Surgery, Mayo Hospital Lahore. Informed consent

was obtained. Demographic detail (name, age, sex, anatomical side, duration of TMJ internal derangement) was also be obtained. Then patients were underwent arthrocentesis by a senior consultant surgeon having at least 4 years' residency experience under LA. All surgeries were performed with assistance of researcher. After surgery, patients were shifted in post-surgical wards and discharged from there after 24-48 hours. Patients were advised to present after 1 week of surgery in OPD. After 1 week, patients were evaluated for postoperative maximal mouth opening. Opening was measured by using ruler and maximal mouth opening be measured (as per operational definition). Patients were also asked for presence of postoperative pain by using VAS and score was noted (as per operational definition) by researcher himself. All this information was recorded through proforma (attached).

Data Analysis: The collected information was fed into SPSS 21 for analysis. Quantitative information including mean and standard deviation was supplied for variables such age, duration of TMJ internal derangement, maximum mouth opening, and postoperative pain score. Statistics were employed to provide a qualitative explanation of characteristics like sex distribution and frequency of occurrence of body parts. Age, gender, affected body side, and duration of TMJ internal derangement were used to further classify the obtained data. After applying stratification, a t-test was run on the remaining samples to determine statistical

significance, and a value of P 0.05 was considered to be significant.

RESULTS

Mean of duration of TMJ Internal derangement was 49.86 ± 19.12 . Mean of maximal mouth opening was 35.55 ± 3.51 mm. Mean post-operative pain was 2.23 ± 1.06 . Post stratification T-test used to check the significance for maximal mouth opening (p-value 0.001, Significant). Post stratification T-test used to check the significance for post-operative pain (p-value 0.001, Significant). Stratification was done for maximal mouth opening and post-operative pain with respect to age, gender, anatomical side and duration of TMJ derangement. A total of sixty cases meeting inclusion and exclusion criteria were analyzed to determine the prevalence of internal derangement of the temporomandibular joint (maximum mouth opening and pain after surgery). Sixty percent, or $n=36$, of the patients were found to be between the ages of 18 and 35, and forty percent, or $n=24$, were found to be between the ages of 36 and 60. The median age was 37.38.15.113. It was found that women accounted for 53.3% ($n = 32$) of the total patient population, while men made up 46.7% ($n = 28$) of the total. It was found that 45% of patients ($n=27$) and 55% of patients ($n=33$) with TMJ internal derangement fell into the group of 51-90 days.

Table 1

Distribution				
Age	Frequency	Percent	Valid Percent	Cumulative%
18-35	36	60.0	60.0	60.0
36-60	24	40.0	40.0	100.0
Total	60	100.0	100.0	Mean±Sd = 37.38±15.113
Duration Of TMJ Internal Derangement				
	Frequency	Percent	Valid Percent	Cumulative%
25-50 Days	33	55.0	55.0	55.0
51-90 Days	27	45.0	45.0	100.0
Total	60	100.0	100.0	Mean±Sd = 49.86±19.12
Gender				
	Frequency	Percent	Valid Percent	Cumulative%
Male	28	46.7	46.7	46.7
Female	32	53.3	53.3	100.0
Total	60	100.0	100.0	
Anatomical Side				
	Frequency	Percent	Valid Percent	Cumulative%
Left	30	50.0	50.0	50.0
Right	30	50.0	50.0	100.0
Total	60	100.0	100.0	

Table 2

Distribution					
	N	Minimum	Maximum	Mean	SD
POP	60	0	4	2.23	1.064
Maximal Mouth Opening	60	29	40	35.55	3.505

Table 3

Stratification Of Maximal Mouth Opening Using T-Test						
Maximal Mouth Opening	Age	N	Mean	SD	Std. Error Mean	P-Value
		18-35	36	34.97	3.668	0.611
	36-60	24	36.42	3.120	0.637	
Maximal Mouth Opening	Gender	N	Mean	SD	Std. Error Mean	P-Value
	Male	28	36.11	3.190	0.603	0.253
	Female	32	35.06	3.741	0.661	
Maximal Mouth Opening	Side	N	Mean	SD	Std. Error Mean	P-Value
	Left	30	35.87	3.159	.577	0.489
	Right	30	35.23	3.848	.703	
Maximal Mouth Opening	Duration(Days)	N	Mean	SD	Std. Error Mean	P-Value
	25-50 Days	33	35.48	3.726	.649	0.354
	51-90 Days	27	35.63	3.283	.632	

Table 4

Stratification Of Post-Operative Pain Using T-Test						
POP	Age	N	Mean	SD	Std. Error Mean	P-Value
		18-35	36	2.00	1.042	.174
	36-60	24	2.58	1.018	.208	

	Gender	N	Mean	SD	Std. Error Mean	P-Value
POP	Male	28	2.14	1.145	.216	0.542
	Female	32	2.31	.998	.176	
	Side	N	Mean	SD	Std. Error Mean	P-Value
POP	Left	30	2.43	1.073	.196	0.047
	Right	30	2.03	1.033	.189	
	Duration(Days)	N	Mean	SD	Std. Error Mean	P-Value
POP	25-50 Days	33	2.36	.994	.173	0.298
	51-90 Days	27	2.07	1.141	.220	

Table 5

Post Stratification T-Test Is Used To Check The Significance, Taking P-Value≤0.05 As Significant					
	N	Mean	SD	Std. Error Mean	P-Value
POP	60	2.23	1.064	.137	0.001
Maximal Mouth Opening	60	35.55	3.505	.453	0.001

DISCUSSION

The majority of the time, illnesses like temporomandibular joint (TMJ) disorders are inadequately diagnosed and treated. While TMJ issues aren't immediately life-threatening, they can certainly make day-to-day life more difficult. When the temporomandibular joint isn't functioning properly, it can cause pain and alter one's sense of self-worth.⁸

TMJ arthrocentesis and lavage with manipulation is a frequent and successful method for treating acute, persistent closed lock of the TMJ that does not respond to more conservative treatments². Arthrocentesis and lavage of the temporomandibular joint were developed as a result of the success of TMJ arthroscopy as both a diagnostic and therapeutic tool (TMJ). After a simple surgery called lavage of the superior joint region, several patients reported considerable reductions in discomfort, increased jaw mobility, and overall improved function.^{9,10}

Researchers were interested in the maximum mouth size and level of discomfort experienced by patients following TMJ arthrocentesis for the correction of an internal disturbance. This research has allowed us to create new methods of management and practices that we believe will be more successful in the long run.

The participants' ages covered quite a spread in this study. Sixty percent of the patients (n=36) were found to be between the ages of 18 and 35, and forty percent of the patients (n=24) were found to be between the ages of 36 and 60. It was found that women accounted for 53.3% (n = 32) of the total patient population, while men made up 46.7% (n = 28) of the total.

Of the total number of patients, 55 percent (n = 33) were found in the 25-50 day range, whereas 45 percent (n = 27) were situated in the 51-90 day range. On average, the TMJ's internal disorder lasted between 49.86 and 19.12 days.

One week after therapy, the average VAS pain score was 2.231.06 (p = 0.001), and one week after therapy, the average mouth openness was 35.553.55 mm (p = 0.001). This shows that the patients' presenting symptoms and difficulties have significantly diminished. This study's results corroborate those of previous works that have discussed the usefulness of arthrocentesis for treating patients with a clinical diagnosis of closed-lock.

One study found that the average post-operative pain was 2.450.88 mm, while the average maximal mouth opening was 33.47 and 52.872 mm. This was the end result of a week-long TMJ arthrocentesis treatment for internal TMJ problems.¹¹⁻¹⁴

Another study found that following surgery, patients experienced an average of 0.27.45 pain intensity and an average maximum opening of 42.9 and 2.48 millimeters in their mouths. The internal dislocation of the TMJ was treated with an arthrocentesis.^{15,16}

This study's findings corroborate those of the first clinical trial showing that TMJ arthrocentesis and lavage combined with manipulation is an effective treatment for acute persistent closed lock of the TMJ, both in terms of increasing the patient's ability to

open their mouth wide and moving their jaw and in terms of decreasing the patient's level of discomfort. Results from this study are consistent with those from the initial clinical trial. Osteoarthritis, early rheumatoid arthritis, and acute intracapsular trauma with haemarthrosis of the TMJ are among conditions for which arthrocentesis and lavage of the joint have been proposed as potential treatments. (Citation required) [Insert citation here] The following advantages arise from the fact that this is an effective method of treating acute closure lock.

Because arthroscopic lavage and lysis were so effective in fixing internal problems, the arthrocentesis operation developed as a natural next step^{17,18}.

Epidemiological evidence suggests that as much as 25% of the population suffers from temporomandibular joint disorders (TMD), however their causes and progression remain poorly understood. As many as 70% of those who suffer from TMD also have a disc issue in their TMJ. The medical term for this is "internal derangement."

Numbers of TMDs vary widely from one study to the next, as shown by cross-sectional epidemiological studies. This was because each study used a distinctive method for data collection, data description, data analysis, and the choice of elements to examine. Based on a meta-analysis of all research that employed the Research Diagnostic Criteria for TMD, it was determined that up to 13% of the general population suffers from masticatory muscle pain. Up to 16% of the general population suffers from disc derangement diseases, and 9% suffer from TMJ discomfort problems. The proportion of TMD patients with each diagnosis was fairly variable; nonetheless, a meta-analysis found that 41% of patients had disc derangement, 41% had muscle disorders, and 34% had joint pain disorders. Muscle problems were present in 45% of individuals.

Joint noises are common, but only around 3.6–7.0% of the population needs treatment for them because they don't hurt and don't get worse with time. Chronic reducing and nonreducing disc displacements that are painless and functionally unimpaired should not be overtreated. Magnetic resonance imaging (MRI) has shown that up to 35% of asymptomatic patients nonetheless may have disc displacements¹⁹.

The purpose of this study was to investigate whether the symptomatic alleviation by arthrocentesis for internal derangements is short-lived or if it lasts for a longer period of time. The results suggest that individuals with internal TMJ derangements may benefit from arthrocentesis in terms of both short-term pain relief and long-term improvements in function. There is a significant improvement in quality of life for 91% of patients who undergo arthrocentesis for anterior disc displacement without degeneration.²⁰

CONCLUSION

We determined that arthrocentesis is a simple procedure that does not require extensive tissue removal. This surgical method has the

potential to realign a TMJ that is misaligned on the inside. Given these results, arthrocentesis has been proposed as a treatment for people with TMJ problems on the inside. To diagnose and treat an internal problem with a closed lock, TMJ arthrocentesis looks to be a safe alternative with less side effects for patients.

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