

ORIGINAL ARTICLE

ARTHROCENTESIS FOR TEMPOROMANDIBULAR JOINT PAIN
DYSFUNCTION SYNDROMEShahid Rauf Jamot, Zafar Ali Khan*, Tahir Ullah Khan**, Riaz Ahmad Waraich*,
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Background: Temporomandibular joint (TMJ) dysfunction is painful condition of facial musculoskeletal system. Arthrocentesis is less invasive treatment of TMJ dysfunctions. It has been used to treat variety of TMJ disorders. The objective of this study was to determine the success of arthrocentesis in TMJPDS patients where conservative treatment had failed. **Methods:** This descriptive case study of 45 patients was completed in 6 months at Outpatient Department of Oral and Maxillofacial Surgery, Mayo hospital Lahore. TMJPDS Patients who were unresponsive to conservative treatment were included in this study. The study consisted of a single arthrocentesis procedure performed by a single oral surgeon per patient. Visual Analogue Scale was used to record pain while maximum mouth opening was measured by the interincisal distance in millimetres, at 1 month and 2 months after the treatment. Success was measured two months after arthrocentesis. **Results:** Thirty (66.7%) patients had no pain and 15 (33.3%) patients had mild pain. Similarly, 16 (35.5%) patients had maximum mouth opening more than 30mm and 29 (64.5%) patients had less than 30 mm mouth opening, two months after arthrocentesis procedure. **Conclusion:** Arthrocentesis is very effective in patients suffering from TMPDS by reducing pain and discomfort and increase in mouth opening. This procedure should be considered in TMPDS patients who do not respond to conservative treatment.

Keywords: Temporomandibular joint; Arthrocentesis; TMJPDS

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INTRODUCTION

Temporomandibular joint pain dysfunction syndrome (TMJPDS) is common problem of oro-fascial region. Patients suffering from this syndrome complain of pain in muscles attached to temporomandibular joint, decrease in mouth opening and clicking sounds during TMJ moment. It is important to keep in mind that myogenous pain occurs more frequently than pain due to articular disorders and its proper diagnosis is essential for successful treatment. TMJPDS is considered the most common musculoskeletal disorder that causes pain in the maxillofacial region and when the intensity of pain increases, patient consult their physicians. TMJPDS is most common in patients of 2nd, 3rd and 4th decade of life. Sign and symptoms of TMPDS are common and about 33% of the community suffer from at least one sign and symptom and in 3-7% the severity is so increased that patient needs to be treated by physicians.^{1,2} The female to male ratio vary from 3:1 and 9:1.³

Classification of TMJPDS is separated into non-articular and articular categories and has been eloquently described by de Bont and colleagues.⁴ TMJPDS is a disorder of facial muscles and tempromandibular joint.⁵ Multiple non-invasive and invasive modalities are used to treat this condition. Arthrocentesis is one of the less invasive technique to

treat TMJ pain and limited mouth opening.⁶ TMJ arthrocentesis was initially performed by Nitzan *et al* by lyses of adhesions and lavage of inflammatory mediators in the upper compartment of the TMJ.⁷⁻⁹ Arthrocentesis is used in patients where medical treatment and physiotherapy has failed to relieve patient's symptoms and its success rate is up to 60%.¹⁰⁻¹³

Conceptually, irrigation and lavage under sufficiently high hydraulic pressure causes the widening of joint space and it also results in lyses of soft tissue adhesion due to which range of TMJ moment is increased.¹⁴⁻¹⁶ Additionally, flushing of TMJ with pressure flushes out the inflammatory mediators from the joint space and reduce the pain of joint.¹⁴⁻¹⁶ Arthrocentesis is a less invasive procedure that may be performed with the local anaesthetic, intravenous conscious sedation, or a general anaesthetic, depending on surgeon and patient preferences and is very effective in term of reducing pain and increase in mouth opening in patients suffering from TMPDS.¹⁷⁻¹⁹

The objective of this research was to assess the success of arthrocentesis in reducing TMJ pain and mouth opening in patients suffering from TMPDS. In those individuals where conservative treatment has failed (physiotherapy, medicine, appliances etc) and where surgery is avoided due to

its drawbacks, this procedure will help them to establish a healthy functional state of TMJ.

MATERIAL AND METHODS

This descriptive case series study was conducted at Department of Oral & Maxillofacial Surgery Mayo hospital Lahore Pakistan from July 2010 to February 2011. Sample size of 45 cases was calculated with 95% confidence interval, 5% margin of error and taking expected success rate, i.e., 60% after 2 months of arthrocentesis in patients of TMJ with pain. The patients with TMJ pain from 0–3 on VAS, with limited mouth opening (less than 25 mm) and who failed to response to conservative therapy were included in this study. Patients with history of trauma, TMJ ankyloses, and having myalgia were excluded from the study.

Success was measured 2 months after arthrocentesis treatment when both criteria were fulfilled as mentioned below:

Pain: No or Mild pain {(0 or 1 on VAS) on a scale of 0-3, 0 = no pain, 1 = mild pain, 2 = moderate pain, 3 = severe pain}.

Jaw movement Restriction: Maximum Mouth Opening (> 30 mm).

After taking approval from hospital ethical committee, informed consent from patient was taken for examination and procedure. Patient demographics including name, age, sex, registration number, address, and phone number were noted. Procedure was done by a single oral surgeon. Pain to the patient was recorded on Visual Analogue Scale and maximum mouth opening was measured by measuring interincisal distance in millimetres. This was measured pre-operatively, 1 and 2 months after treatment. Success was measured as per operational definition two months after the procedure. All this information was collected through a specially designed *pro forma*. Data was entered and analysed using SPSS Version 16. Mean and standard deviation was calculated for continuous variable such as age. Frequencies and percentages were calculated for qualitative variables such as gender and success (as per operational definition). Data was stratified for severity of pain (moderate-2 or severe-3) and mouth opening (<10, >10 mm).

RESULTS

According to non-probability purposive sampling technique, the sample size was of 45 patients. There were 12 (26.7%) male while 33 (73.3%) were female. The age range of the patients was 18 to 30 years with a mean of 23.5. Pre-operative mean MMO was 14.24mm 4.2 and post-operative mean MMO was 27.6 mm with standard deviation of 4.2 mm and 6.9 mm respectively.

The achieved success rate which was explained in operational definition in 16 patients was 35.5% in which the maximum mouth opening after the procedure was more than 30 mm, while the rest were less than the defined criteria of success.

There was no pain on visual analogue scale (VAS) in 30 patients post operatively which makes about 66.7% of the total sample size (45) while the rest of them (33.3%) had mild pain after the procedure.

Success was measured two months after arthrocentesis when both criteria (no 2-mild pain and maximum mouth opening) fulfilled.

Table-1: Pre and post-operative mean maximum mouth opening along with the standard deviation. (MMO- Maximum mouth opening) (n=45)

Mouth opening	No.	Mean	SD
Pre-op MMO	45	14.24 mm	4.2 mm
Post op MMO	45	27.6 mm	6.9 mm

Table-2: Frequencies and percentages of success as maximum mouth opening

MMO after procedure	Frequency	% ages
<=30 mm	29	64.5
>30 mm (Success)	16	35.5

Table-3: Frequencies and percentages of success as post-operative severity of pain (n=45)

Severity of pain	Frequency	Percent
No pain on VAS	30	66.7
Mild pain on VAS	15	33.3

Table-4: Frequencies and percentages of success (n=45)

Success	Frequency	Percent
Yes	16	35.
No	29	64.5
Total	45	100

DISCUSSION

The frequency of TMJPDS is increasing day by day. Various surgical procedures performed for these problems, although fairly successful, were associated with surgical risks and potential long-term sequel. The greatest problems faced by surgeons involved failed alloplastic implants and patients undergoing multiple operations. Although arthrocentesis is not a panacea, it has been used for various TMJ disorders.²² The aim of this study was to address the efficacy of arthrocentesis in the treatment of limited mouth opening and pain associated with TMJPDS. Several studies regarding the efficacy of TMJ arthrocentesis have been conducted in the past, showing gender predilection for female associated with TMD symptoms, therefore female to male ratio is quite high. The age groups involved with these symptoms are the adults.

A study carried out regarding TMJ arthrocentesis in 1991 by Nitzan *et al* included 17

patients in which 14 were female and 3 male, with a mean age of 32.6 years.²⁰ Murakami *et al*, in 1995 included 20 patients out of which 17 were female and 3 were male with a mean age of 31.2 years. In the same year (1995) study was conducted by Dimitroulis *et al* who increased the number of patients to 46, including 44 females and 2 males with a mean age of 32.5 years. Then the next year in 1996 Hosaka *et al* carried a study and involved total of 20 patients with 17 females and 3 males with a mean age of 31.2 years. Alpaslan & Alpaslan conducted their study in 2001 by including 15 patients in which there was 1 male and rest were females with mean age of 31.9 years.²¹ In 2005 Yura & Totsuka included 65 patients all being female with mean age of 40 years.²² In comparison with these studies, we included a total of 45 patients in which 33 were females and 12 were males. Mean age in our study as compared with other studies was low. The follow up duration was mostly in months in the studies conducted in the past ranging from 1 to 30 months. Our study included the follow up duration of 2 months.

The mean maximum mouth opening (MMO) was calculated preoperatively and postoperatively in different studies with different results. Nitzan *et al* in 1991 calculated preoperative mean MMO as 24.1 mm and 42.7 mm as postoperative mean MMO.²⁰ In 1995 Murakami *et al* calculated mean MMO as 30.6 mm pre-operative and 42.5mm post-operative. In same year Dimitroulis *et al* calculated mean MMO as 24.6mm and 42.3 pre-and post-operatively. In 1996 Hosaka *et al* measured the mean MMO as 30.6mm preop and 44.5 mm postop. Sanroman conducted study in 2004 and measured the mean MMO as 24mm and 41 mm which was measured pre and postop. In 2006 Kaneyama *et al* conducted study by calculating the mean MMO of the patient pre and post operatively as 26.4 mm and 44.4mm. In year 2001 Alpaslan & Alpaslan similarly calculated preoperatively and postoperatively mean MMO as 28.4mm and 39.1mm respectively.²¹ Yura and Totsuka measured the mean MMO as 28.6mm and 38.4 mm pre and postoperatively.²² According to our study the mean MMO was observed pre and post operatively by calculating the inter incisal distance which was 14.24 mm SD 4.2 and 27.6 mm SD 6.9 respectively. Another important factor was to check the pain which is measured according to the visual analogue scale, and includes a scale of numbers ranging from 0 to 3 or 5 or 10 denoting the severity of pain. Visual analogue scale used in our study was from 0 to 3, being 0-no pain, 1-mild, 2-moderate and 3-severe pain. This pain was measured pre and post operatively and there was significant reduction in pain post operatively and it revealed that out of 45 patients postoperatively, 30 patients had no pain and

15 patients had mild pain thereby reducing the severity of pain.

The studies in which pain severity fell from severe to mild following arthrocentesis include Nitzan *et al*, Dimitroulis *et al* (1995), Carvajal & Laskin. Studies in which pain decreased from moderate to mild or no pain include those by Alpasla & Alpaslan and Yura & Totsuka.^{21,22} In comparison to these studies, there was significant reduction in pain post operatively in our study and it revealed that out of 45 patients postoperatively, 30 patients had no pain and 15 patients had mild pain thereby reducing the severity of pain.

CONCLUSION

Treatment of TMJ internal derangements with arthrocentesis is very effective by reducing patient's discomfort, pain and increase in range of jaw moments. Therefore, it is recommended that arthrocentesis should be considered when conservative treatment failed to relieve the patient's symptoms.

AUTHORS CONTRIBUTION

SJ conceived the idea, planned the study, and drafted the manuscript. ZA and TU helped in acquisition of data and literature search. MF and RW did statistical analysis. All authors contributed significantly to the submitted manuscript.

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