

OUTCOMES OF AUTOGENOUS BLOOD INJECTION IN THE TREATMENT OF RECURRENT DISLOCATION OF TEMPOROMANDIBULAR JOINT (TMJ)

¹SHAHEEN ANJUM, BDS

²MUHAMMAD FAISAL, BDS, FCPS, FAO-CMF

³MUHAMMAD NADEEM, MBBS, FCPS

⁴RIAZ AHMED WARRAICH, BDS, MCPS, MDS, PhD

ABSTRACT

Recurrent Temporomandibular dislocation has been managed in the past with both surgical and non-surgical modalities. The objective of this study was to assess the functional results of autologous blood injection into the joint space for recurrent TMJ dislocation.

This study was conducted in the department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry Multan from July 2011 to July 2012. A total of eleven patients of recurrent dislocation of jaw were managed by autogenous injection of blood into glenoid fossa with temporary intermaxillary fixation for 15 days. All patients were female with mean age 40.18 ± 7.83 years (range from 30 to 55 year). Diagnosis was made by clinical and radiographic judgment of OPG. The major cause of dislocation was prolonged forceful opening of jaw. Functional assessment was performed by clinical assessment after opening and closing of jaw. Mouth opening was assessed by measurement of interincisal distance pre and post operatively. Outcome measures of interincisal distance are done by inch tape and other outcomes were assessed by clinical judgment. Data was analysed using SPSS version 15.

In one patient dislocation recurred after three months of procedure but frequency of dislocation reduced. In another patient dislocation occurred immediately after release of intermaxillary fixation. In other patients recurrence did not occurred after release of intermaxillary fixation at 6 months follow up. No significant treatment complication occurred. Pain on injection and swelling occurred in all patients for a brief period.

Autogenous blood injection in glenoid fossa with intermaxillary fixation for 15 days is a safe and effective treatment in cases of recurrent dislocation of TMJ.

Key Words: TMJ dislocation, autologous blood injection, Intermaxillary fixation.

INTRODUCTION

Dislocation of the temporomandibular joint (TMJ) occurs when one or both mandibular condyles are

displaced in front of the articular eminence.¹ For the mouth to close it requires the following muscles: the masseter, temporalis, and medial pterygoid muscle. For the jaw to open it requires the lateral pterygoid muscles.² There are four different positions of jaw dislocation: posterior, anterior, superior and lateral. The most common position is anterior. Anterior dislocation shifts the lower jaw forward if the mouth excessively opens. This type of dislocation may happen bilaterally or unilaterally after yawning. The muscles that are affected during anterior jaw dislocation are the masseter and temporalis which pull up on the mandible and the lateral pterygoid which relaxes the mandibular condyle.³ Acute mandibular dislocation is

¹ Assistant Professor, Department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry, Multan, Email: shaheen_njm@yahoo.com, maxfas@live.com Postal address: House 520, Naqashband Colony, Near Fatima Medical Centre, Khanewal Road, Multan.

² Senior Registrar, Department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry, Multan.

³ Assistant Professor, Department of Anesthesia, Nishtar Hospital Multan.

⁴ Professor (Oral & Maxillofacial Surgery), Pakistan Institute of Medical Sciences, Islamabad.

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usually reducible. If the condyle continues to dislocate several times, it is described as chronic recurrent TMJ dislocation. Dislocation of TMJ is generally of unknown origin, while several theories have been put forward to explain its onset. It is commonly associated with the poor development of the articular fossa, laxity of the temporomandibular ligament or joint capsule, and excessive activity of the lateral pterygoid and infrahyoid muscles due to drug use or disease. Additionally some disorders of collagen metabolism such as ligamentous hyperlaxity and Ehler-Danlos syndrome might be related.⁴

Short-term symptoms can range from mild to chronic headaches, muscle tension or pain in the face, jaw and neck. Long-term symptoms can result in sleep deprivation, tiredness/lethargy, frustration, bursts of anger or short fuse, difficulty performing everyday tasks, depression, social issues relating to difficulty talking, hearing sensitivity (particularly to high pitched sounds), tinnitus and pain when seated.⁵

METHODOLOGY

This study was conducted in the department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry, Multan, from July 2011 to July 2012. It was a descriptive study. Sampling technique used was non probability convenient sampling. All patients not getting benefits by conservative means and those who were experiencing dislocations 3 to 4 times a day were included in this study. Patients with acute dislocation of jaw were excluded. A total of 11 patients of recurrent dislocation of jaw were managed by autogenous injection of blood into glenoid fossa with temporary intermaxillary fixation for 15 days. All patients were female with mean age 40.18 ± 7.83 years (range from 30 to 55 year). Functional assessment was performed by clinical assessment after opening and closing of jaw. Data were analysed using SPSS version 15.

Technique: The technique consisted of visually identifying a line from tragus to the eye angle. Then the articular fossa point was identified in this line, 10 mm anteriorly to tragus and 2 mm below the line. A 19-gauge needle was inserted at the articular fossa point. After injection of saline in the superior compartment, five cc of autologous blood drawn from the cubital fossa was injected (4 cc in the superior compartment and one cc in the pericapsular tissue).

RESULTS

A total of 11 patients of recurrent dislocation of jaw were managed by autogenous injection of blood into glenoid fossa with temporary intermaxillary fixation for 15 days. All patients were female with mean age 40.18 ± 7.83 years (range from 30 - 55 years). Table 1. Average preopinterincisal distance was 39.8mm; average postop interincisal distance was 39.18mm. Average decrease in interincisal distance was 0.62mm. (P value 0.2) as analysed by t test. This is not significant. No other significant treatment complication occurred as shown in Table 2. Recurrence of dislocation occurred in two patients (18%). Pain and swelling on injection occurred in all patients (100%).

TABLE 1: DISTRIBUTION OF AGE RANGE AMONG PATIENTS

Age range	Frequency	Percentage
30 – 35 year	5	45
36 – 40 year	2	18
41 – 45 year	2	18
45 – 50 year	1	9
50 – 55 year	1	9

TABLE 2: DISTRIBUTION OF COMPLICATIONS AFTER TREATMENT

Complications / outcomes	Frequency	Percentage
Pain and swelling on injection	11	100
Recurrence	2	18
Foreign body reaction	0	0
Ankylosis	0	0
Articular cartilage degeneration	0	0
Facial asymmetry	0	0
Facial nerve weakness	0	0
Deviation of jaws	0	0

DISCUSSION

Chronic recurrent TMJ dislocation is a painful and alarming illness that patients usually cannot reduce dislocated joints by themselves. Recently ABI has been used for the treatment of chronic recurrent TMJ dislocation. ABI for chronic TMJ dislocation was first reported in the German literature in 1964 by Brachmann.¹

It can be thought that ABI is more advantageous because of the less complication probability regarding to the other nonsurgical methods. The pathophysiology of blood injection is that after injection, the capsule swells and stretches. In the next few hours or days, an inflammatory reaction starts via mediators released from neighboring platelets, wounded and dead cells. As a result, neighboring tissues swell and the joint has difficulty in motion. Thereafter, organized blood clots and fibrous tissue structures lead to joint stiffness. These tissues cause permanent limitation in joint motion. The contact of cartilage with blood leads to impairment of the cartilage matrix cycle. The injected blood artificially triggers an inflammatory reaction, which in turn leads to fibrosis, adhesions and scars in the neighboring tissues. Immobilization prevents the early tension produced by new fibrous tissue.⁶

Autogenous injection of blood (ABI) is an effective technique as it cured 9/11(82%) of this study patients after 6 months follow up. In one case recurrence occurred after two months of followup. In another patient dislocation of jaw occurred immediately after the release of intermaxillary fixation. She was previously operated for dislocation and eminectomy was done in this patient which was not successful. As there was no eminence, there may be loose ligaments and muscles in this region so ABI failed to induce fibrosis in this region. Machon in one study treated 25 patients diagnosed with chronic recurrent TMJ dislocation by bilateral injections of autologous blood into the upper joint space and around the TMJ capsules. Eighty percent had a successful outcome and required no further treatment at their 1-year follow-up. Schulz treated 16 patients in 1973 by ABI to the affected TMJ twice a week for 3 weeks followed by immobilization via intermaxillary fixation for 4 weeks. The symptoms were disappeared in 10 patients at 1-year follow-up. In other study 9 cases with ABI into superior joint space and 9 cases with ABI into superior joint space and 1 cc blood injected into pericapsular tissue.¹ Results of both groups compared and both groups revealed successful results. This study is also consistent to the present.

Jacobbi-Hermanns published the experience with 19 patients who received only one ABI and had intermaxillary fixation for 14 days. At 18 months follow-up, 17 patients were symptom free.⁷ Hasson reported the successfully treated 3 patients with ABI (4 cc superior

joint space and 1 cc pericapsular tissues). After the treatment, elastic bandage was applied and left for the first 24 hours.⁷ Kato et al presented the treatment of chronic recurrent TMJ dislocation by ABI (3 cc superior joint space and 1 cc pericapsular tissues) in an 84-year-old female under local anesthesia. The mandible had been fixed with a bandage and the use of bandage had been continued for one month as a precaution.⁸ Pinto et al successfully treated an 83-year-old female patient by injecting 10 cc of ABI into the superior joint space and the periarticular tissue.⁹ They used a face lift bandage for one month after the procedure and got successful results. These findings are consistent with findings of my study in which 82% success rate is achieved.

In the present study there was no statistically significant decrease in mouth opening but these findings contradicts with results of Triantafillidou who treated twenty-five patients with autologous blood injection into the upper joint space and around the joint capsule (group A). A control group of 15 patients with the same diagnosis were subjected to physiotherapy with muscular exercise (group B). Patients in group A were reevaluated 3 months after treatment and those in group B were reevaluated after 3 months of physiotherapy. A statistically significant reduction in maximal mouth opening and TMJ sounds was noted only in group A, whereas the reduction for group B was minimal. In my study no statistically significant reduction in mouth opening occurred. This difference in results may be due to hard chewable diet and life patron of my study patients in whom reduction in mouth opening didn't occurred without physiotherapy.¹⁰ Daif in another study also used ABI in 30 patients dividing them into two groups. He injected ABI in superior joint space in one group A and injected ABI in superior joint space and pericapsular tissues in other group B. After one year follow up success rate was 80% in group A and B but decrease in interincisal distance was 5.3 ± 2.1 in group B. No structural changes to articular cartilage occurred in both groups. These results are also consistent with my results. In my study ABI was only used into superior joint space so no decrease in mouth opening occurred.¹¹

No treatment complications occurred in this study. These results are consistent with the results of candirli study in which, 14 patients were treated by ABI. After

one month follow up, all patients were recovered with no recurrence. He examined pathological changes in joints on MRI in early period and late period. There were no late period pathologies even in cases of frequent injections. The impairment in the cartilage matrix which could be seen in the early period recovered to complete normal state later.⁵ Gulses also showed by his study on pigs that ABI is a safe technique. A total of 16 healthy adult country bred pig were used in his study. Autologous blood was injected into the upper joint space (4 ml) and around the capsule of TMJ unilaterally (1 ml). This procedure was then repeated on the opposite side only by using 5 ml of 0.9% saline. TMJ capsules and retrodiscal ligaments were examined four weeks following the injections. Histological examination of TMJs injected with autologous blood revealed fibrotic changes in 81.25% of the retrodiscal ligaments and 56.25% of the capsular areas. Whilst no changes were seen in the retrodiscal ligaments or in the capsules of TMJs injected with saline alone.¹² Stembirek also used 12 pigs (*Sus scrota f. domestica*) as a model species for autologous blood delivery into the TMJ. Blood injection was followed by histopathological analysis at different times after treatment (1h, 1, 2 and 4 weeks). Samples were examined by magnetic resonance imaging, macroscopic and histological methods. The deposition of the remaining blood was observed in the form of clots in the distal parts of the upper joint cavity 1h and 1 week after treatment. 2 weeks after treatment, small blood clots were still apparent in the distal part of the upper joint cavity. 4 weeks after surgery, no remnants of blood, changes or adhesions were apparent inside the TMJ. No morphological or histological changes were observed in the TMJ after the injection of autologous blood.¹³ These results are consistent with findings of my study which proved ABI a safe technique.

CONCLUSION

ABI in the treatment of chronic recurrent TMJ dislocation is a successful having advantages such as no requirement of dissection; few post-operative complications such as swelling and pain on injection, no facial nerve injury, no infection, no foreign body reac-

tion, no ankylosis, no articular cartilage degeneration, no loss of sensation, no necessity to stay in hospital, and easiness of administration under local anesthesia. To sum up, ABI for patients with chronic recurrent TMJ dislocation was an effective, safe, and simple technique that could be used before surgery. However, more clinical and experimental studies should be performed to evaluate the efficacy of the treatment modality.

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