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EFFICACY OF AUTOLOGOUS BLOOD INJECTION IN SUPERIOR JOINT SPACE WITH AND WITHOUT PERI-CAPSULAR TISSUE IN MANAGING CHRONIC RECURRENT TEMPOROMANDIBULAR JOINT DISLOCATION

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Abstract

Background

Chronic recurrent temporomandibular joint (TMJ) dislocation is a painful condition that is defined as recurrent anterior displacement of the condyle over the articular eminence, causing pain, difficulty in chewing, speech problems, and recurrent difficulty in mouth closure. Minimally invasive and cost-effective, autologous blood injection has proved to offer potentially good clinical results.

Objective

To evaluate the effectiveness of autologous blood injection in the superior joint space alone and the superior joint space with peri-capsular tissue injection to treat chronic recurrent TMJ dislocation.

Place and duration of study: *From May 2025 to October 2025 Oral & Maxillofacial Surgery Sandeman Provincial Hospital / Bolan Medical College / Hospital Quetta.*

Methodology: *The prospective observational study caws carried out for six months in the Department of Oral and Maxillofacial Surgery. Using a non-probability consecutive sampling technique, a total of 140 patients with chronic recurrent TMJ dislocation were included. A total of 18 60-year-olds were enrolled if they had recurrent dislocation for over 6 months. Patients with ankylosis, infection, trauma, coagulation disorders, and previous TMJ surgery were excluded. The participants were split into two groups, each with an equal number of patients. Group A was given an injection in the superior joint space only, and Group B was injected into the superior joint space and peri-capsular tissue. Follow-up was performed after one and three months. The data were analysed by SPSS version 25.*

Results

The 140 patients, 82 (58.6%) were females and 58 (41.4%) were males, with a mean age of 35.8 ± 10.4 years. Recurrence was observed in 20% patients in Group A and 7.1% in Group B (p=0.031). Significant reduction in mouth opening and pain scores was observed in Group B compared with Group A

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(p<0.05). Overall success rates were 80% and 92.9%, respectively.

Conclusion

Autologous blood injection is a safe, effective treatment for chronic recurrent TMJ dislocation. Superior joint space and peri-capsular tissue injection is more effective and has a lower recurrence rate versus superior joint space injection alone.

Introduction

A clinical condition of dislocation of the mandibular condyle away from the articular eminence is termed temporomandibular joint (TMJ) dislocation, which is associated with the inability to close the mouth without external assistance. Chronic recurrent temporomandibular joint dislocation is defined as repeated occurrences of mandibular condylar displacement and is a disorder that can be distressing due to its effects on mastication, speech, social interaction, and quality of life. It is either unilateral or bilateral and frequently accompanied by pain, muscle spasm, facial discomfort, and functional difficulties [1,2]. Numerous factors contribute to the etiology of chronic recurrent TMJ dislocation. Several predisposing factors have been identified, such as ligament laxity, capsular weakness, shallow mandibular fossa, neuromuscular disorders, trauma, connective tissue disorders, excessive mouth opening, and prolonged dental or surgical procedures. Recurrent dislocation may occur as a result of abnormal muscle activity or laxity of the connective tissue in certain systemic conditions, including epilepsy, Parkinsonism, and Ehlers-Danlos syndrome. Females are more commonly affected than males, perhaps due to greater joint laxity and hormonal factors [3,4]. Recurrent dislocation of the TMJ is still difficult to manage. Different conservative and surgical techniques have been suggested, such as manual reduction, intermaxillary fixation, interposition of sclerosing agents, injection of botulinum toxin, retinectomy, capsulorrhaphy, and augmentation. Surgical procedures are usually only performed in severe or intractable cases, as they can be costly, increase the length of hospital stay, lead to facial nerve damage, scarring, and increased morbidity. Due to this, we prefer to use minimally invasive procedures as initial treatment [5]. Autologous blood injection (ABI) has proven to be a safe, low-cost, and non-invasive treatment option for chronic recurrent TMJ dislocation. This is done by injecting the patient's own venous blood into the superior joint space and peri-capsular tissues. The inflammatory reaction and fibrosis of the injected blood into the joint capsule prevent excessive mandibular movements and stabilize the condyle in the glenoid fossa. The popularity of ABI is due to its simplicity, low cost, few complications, and claimed success rates in the literature [6,7]. Autologous blood injection has been shown to yield good clinical results in several studies, ranging from 75% to 95% success. After treatment, patients are likely to see fewer episodes of recurrence, less pain, and more stability of the joints. Injection of the superior joint space only has been suggested by some authors, while injection of the surrounding capsular tissue has been suggested by others in order to increase fibrosis and increase the stabilization. There is, however, some controversy as to both the best method of injection and the long-term effectiveness [8]. ABI is a practical solution in developing nations, particularly in resource-poor hospitals, where performing more complex surgical operations is not feasible due to limited equipment and/or the need for general anesthesia. Although the use of ABI has grown, limited local data compares superior joint space injection alone vs superior joint space and peri-capsular tissue injection. Hence, this study aimed to compare the effectiveness of peri-capsular tissue injection in superior joint space autologous blood injection alone in the treatment of chronic recurrent temporomandibular joint dislocation [9,10].

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Study Objective

The clinical efficacy of injection of autologous blood into the superior joint space only or into the superior joint space and into the peri-capsular tissue in patients with chronic recurrent temporomandibular joint dislocation was compared.

Materials And Methods

Study Design & Setting

The prospective observational study which was carried out in the Department of Oral Maxillofacial Surgery of a tertiary care hospital for six months from the date of obtaining institutional ethical clearance.

Participants

The patients were enrolled, and the total number was 140 patients, who were diagnosed with chronic recurrent temporomandibular joint dislocation with non-probability consecutive sampling. The patients were between 18 and 60 years of age and had experienced recurrent dislocation for 6 or more months. Clinical history, physical examination, and detailed radiographic evaluation were done before enrollment to diagnose and determine the eligibility criteria.

Sample Size Calculation

The calculated sample size was 140 patients using the sample size calculation formula provided by WHO with the following parameters: 95% confidence interval, 80% study power, and expected success rate from previous studies of superior injection of the joint space versus combined peri-capsular tissue injection in the management of recurrent TMJ dislocation.

Inclusion Criteria

- Patients aged 18–60 years
- Patients who have suffered chronic recurrent TMJ dislocation > 6 months
- All cases of unilateral and bilateral TMJ dislocation
- Willingness and informed consent of patients to participate in the study

Exclusion Criteria

- Patients with ankylosis of the TMJ joints.
- Acute TMJ infection/facial space infection
- Previous TMJ surgery
- Coagulation problems or the use of drugs that prevent blood from clotting.
- Hex of trauma to the face involving TMJ
- Systemic inflammatory joint diseases

Diagnostic and Management Strategy

Diagnosis was confirmed by clinical examination, history of recurrent dislocation of the mandible, and radiographic examination. The patients were randomly split into two groups of equal size. Group A was injected with autologous blood in the superior joint space, while Group B was injected with autologous blood in the superior joint space and peri-capsular tissue using aseptic technique and local anesthesia.

Statistical Analysis

Using SPSS version 25, data were entered and analyzed. Age, mouth opening, and pain scores were quantitative and presented as mean ± SD. Frequencies and percentages were used for qualitative variables. Independent t-test and chi-square test were used to compare between groups. A p-value of < 0.05 was deemed to be statistically significant.

Results

A total of 140 patients were included in the study, comprising 82 (58.6%) females and 58 (41.4%) males. The overall mean age of participants was 35.8 ± 10.4 years. Group A consisted of 70 patients treated with autologous blood injection into the superior joint space only, while Group B included 70 patients treated with superior joint space and peri-capsular tissue injection. Bilateral TMJ involvement was observed in 92 (65.7%) patients, whereas unilateral involvement was noted in 48 (34.3%) patients. At three months follow-up, recurrence of dislocation occurred in 14 (20%) patients in

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Group A compared to 5 (7.1%) patients in Group B, showing statistically significant improvement in the combined injection group (p=0.031). Mean maximum mouth opening in Group A reduced from 46.2 ± 4.3 mm preoperatively to 40.1 ± 3.8 mm postoperatively, while Group B demonstrated reduction from 45.9 ± 4.1 mm to 37.2 ± 3.4 mm (p=0.002). Pain scores measured using visual analogue scale improved significantly in both groups, with greater reduction observed in Group B (p=0.018). No major complications such as facial nerve injury, infection, or TMJ ankylosis were observed during follow-up.

Intervention Outcome

Autologous combined injection of the superior joint space and peri-capsular tissue had better clinical effects than the superior joint space injection alone. Patients in the combined injection group had fewer recurrences, better pain control, and more success, as well as a greater reduction in excessive mouth opening and fewer postoperative complications.

Table 1: Demographic Characteristics of Study Participants (n=140)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	58	41.4
Female	82	58.6
Age Group (Years)		
18–30	46	32.9
31–40	52	37.1
41–50	28	20.0
51–60	14	10.0
TMJ Involvement		
Unilateral	48	34.3
Bilateral	92	65.7

This table demonstrates demographic distribution of study participants including gender, age categories, and type of temporomandibular joint involvement among patients enrolled in the study.

Table 2: Comparison of Baseline Clinical Parameters Between Study Groups

Clinical Parameter	Group A (n=70) Mean ± SD	Group B (n=70) Mean ± SD	p-value
Age (Years)	35.6 ± 10.2	36.0 ± 10.6	0.812
Preoperative Mouth Opening (mm)	46.2 ± 4.3	45.9 ± 4.1	0.674
Preoperative Pain Score (VAS)	7.2 ± 1.1	7.4 ± 1.0	0.298
Duration of Symptoms (Months)	11.8 ± 3.6	12.1 ± 3.9	0.645

This table compares baseline demographic and clinical characteristics between Group A (superior joint space injection only) and Group B (superior joint space with peri-capsular tissue injection). No statistically significant difference was observed at baseline.

Table 3: Comparison of Postoperative Outcomes Between Study Groups

Outcome Variable	Group A (n=70)	Group B (n=70)	p-value
Recurrence of Dislocation, n (%)	14 (20%)	5 (7.1%)	0.031
Postoperative Mouth Opening (mm) Mean ± SD	40.1 ± 3.8	37.2 ± 3.4	0.002

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Postoperative Pain Score (VAS) Mean ± SD	3.1 ± 0.9	2.0 ± 0.8	0.018
Overall, Success Rate, n (%)	56 (80%)	65 (92.9%)	0.024

This table illustrates postoperative clinical outcomes between both treatment groups. Group B demonstrated significantly lower recurrence rates, greater reduction in mouth opening, improved pain scores, and higher success rates compared with Group A.

Table 4: Postoperative Complications Among Study Groups

Complication	Group A (n=70)	Group B (n=70)	p-value
Infection	1 (1.4%)	0 (0%)	0.315
Facial Nerve Injury	0 (0%)	0 (0%)	—
TMJ Ankylosis	0 (0%)	0 (0%)	—
Mild Swelling	5 (7.1%)	7 (10%)	0.542
Temporary Pain at Injection Site	9 (12.9%)	11 (15.7%)	0.638

This table presents postoperative complications observed among study participants. No major complications were reported in either group, confirming the safety and minimally invasive nature of autologous blood injection therapy.

Discussion

Chronic recurrent temporomandibular joint (TMJ) dislocation is still a challenging situation due to recurrent episodes of condylar displacement, associated pain, functional limitation, and diminished quality of life. Several conservative and surgical treatment options have been suggested, but utilization of minimally invasive techniques like Autologous Blood Injection (ABI) has been growing due to its simplicity, safety, low cost, and good clinical results. In the present study, the effectiveness of the superior joint space injection only was compared to superior joint space injection along with peri-capsular tissue injection in the treatment of chronic recurrent TMJ dislocation [11,12].The majority of the patients were females (58.6%) in the present study, which was in agreement with the previous literature that showed a higher prevalence of TMJ disorders among females due to hormonal effects, increased ligament laxity, and connective tissue variations. Amer et al. (2021) and Rashid et al. (2023) reported a similar predominance of females in their cohort of recurrent TMJ dislocation, with middle-aged women being more affected than males. The mean age of 35.8 ± 10.4 observed in our study also matches the results of recent regional and international studies that assessed ABI for recurrent dislocation of TMJ [13]. The current study revealed significantly reduced recurrence in patients who received both superior joint and peri-capsular tissue injections (7.1% vs. 20%, p=0.031). The results confirm the hypothesis of peri-capsular injection to improve the stabilization of the mandibular condyle through more fibrosis around the joint capsule. The same authors (Rashid et al., 2023) also found that the addition of autologous blood to peri-capsular tissues further significantly reduced the mouth opening and mouth opening recurrence rates. Similar observations were reported by Daif and associates with their preference for combined superior joint space and peri-capsular injection for better clinical and radiographic results [14,15]. Both groups showed a marked decrease in the maximum mouth opening in the present study, and this decrease was greater in Group B (p=0.002). The opening of the mouth should be reduced under control, as it reduces excessive condylar translation and prevents the mouth from dislocating again, and it should be beneficial. Recent systematic reviews have validated that the ABI usually decreases mouth opening by about 10-20%, and does not cause any permanent functional disability. Choinski et al. (2023) found that excessive mandibular movements were effectively reduced while

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preserving acceptable functional jaw mobility with the use of ABI [16]. Another major discovery in this study was that pain was reduced. Both groups had significantly improved visual analogue scale (VAS) pain scores, with the combined injection group having significantly better results (p=0.018). Sharma et al. (2022) similarly noted a significant decrease in pain after arthrocentesis and ABI in chronic symptomatic TMJ subluxation. Similarly, Chipana et al. (2024) showed that there was a significant difference between the effectiveness of ABI and dextrose prolotherapy in improving pain and joint function [17]. In the present study, no major complications, including ankylosis, facial nerve injury, or severe infection, were noted, which is consistent with the safety of ABI. The results are in agreement with those of the systematic reviews and current clinical trials, which report that there is very little postoperative morbidity with ABI. New data have shown that while ABI causes fibrosis and stabilization, it does not result in pathological ankylosis or permanent limitation of joint movement. Roy et al. (2021) also found that, before invasive surgical procedures, ABI was a safe and affordable alternative [18]. Recent comparative studies have also bolstered the position of conservative treatment with ABI. In the management of recurrent TMJ dislocation, positive results with reduced morbidity were obtained using ABI as compared to retinectomy (Fayed and Ahmed 2024). Similarly, Goyal et al. (2024) showed the high success rate of ABI in different grades of chronic recurrent TMJ dislocation. The overall success rate for the combined injection group of the present study was 92.9%, which is in agreement with the findings in the above-referenced study [19].The present study concluded that autologous blood injection is an effective treatment modality for chronic recurrent TMJ dislocation with a minimally invasive and economic approach. Superior joint space and peri-capsular tissue injection (SJSPTI) was more effective than superior joint space injection alone, with better outcomes in reducing recurrence rate, excessive mouth opening, and pain, and a better safety profile [20].

Limitations

This study was undertaken in a single tertiary care center with a relatively short follow-up period for recurrence of 3 months, which may preclude generalization and longer-term analysis of recurrence. Randomized multicenter trials with longer follow-up periods and larger numbers of patients should be conducted to further confirm the efficacy and safety of the autologous blood injection techniques.

Conclusion

Autologous blood injection is an effective and minimally invasive treatment for recurrent chronic TMJ dislocation. The injection of superior joint space combined with superior peri-capsular tissue showed significant clinical results with fewer recurrences, more pain reduction, more excessive mouth opening, and fewer postoperative complications than the injection of superior joint space alone.

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Conflict of Interest: Nil

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Authors Contributions

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