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# AUTOLOGOUS BLOOD INJECTION WITH INTERMAXILLARY FIXATION FOR TREATMENT OF CHRONIC RECURRENT TEMPOROMANDIBULAR JOINT DISLOCATION

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## Abstract

**Introduction**: Chronic recurrent temporomandibular joint dislocation is a challenging condition that may be difficult to manage appropriately with conservative treatments alone. Autologous blood injection (ABI) and intermaxillary fixation (IMF) appear to be minimally invasive means of stabilizing the joint and decreasing the number of dislocation episodes.
**Objective**: To evaluate the effectiveness of autologous blood injection with intermaxillary fixation in the treatment of chronic recurrent TMJ dislocation.
**Materials and Method:** A prospective interventional study was conducted on 30 chronic recurrent TMJ dislocation patients. ABI was delivered into the TMJ, and IMF was applied for 2 weeks. The outcome was following up with 1 and 3-month follow-up evaluations of dislocation frequency, mouth opening, and patient-reported symptoms.
**Results**: Only 20% of patients suffered dislocation at 3 months. Significant reductions in maximum interincisal opening and joint discomfort were found.
**Conclusion**: Chronic recurrent TMJ dislocation is an effective, safe, and minimally invasive treatment when completed by ABI combined with IMF.

**Keywords**: Autologous blood injection, intermaxillary fixation, temporomandibular joint dislocation, chronic recurrent, treatment efficacy.

## INTRODUCTION

Chronic recurrent dislocation of the temporomandibular joint (TMJ) refers to a very distressing condition involving the painful recurrent anterior displacement of the mandibular (temporomandibular) condyle beyond the articular eminence. For the affected individuals, this leads to functional limitations and a massive loss in the quality of their life. The pathophysiology involves the hypermobility or laxity of the joint capsule and surrounding ligaments, which may be exacerbated by anatomical predisposition, parafunctional habits, trauma, or systemic connective tissue disorders (1). Traditional conservative treatment includes physical therapy, occlusal appliance, and pharmacological treatment. However, they generally fail to offer definitive and minimally invasive ways to counter the instability simultaneously. Autologous blood injection (ABI) has become a neoconservative therapy in nonsensitive patients. This inflammatory response causes stabilization of the joint capsule (fibrosis) and fibrosis in the TMJ space from the injection of blood from the venous system into the TMJ space (1).

Evidence of this concept shows that healing fibrous tissue limits excessive translational movement and prevents condyle dislocation (1). In addition, the technique is inexpensive, easily performed, and has a low risk of harmful side effects, which makes it a more clinically attractive technique. ABI does not use IMF to limit mandibular mobility to aid healing and re-injury when used alone. The IMF screws are used to fix the jaw temporarily and to decrease the functional strain of TMJ to augment ABI therapeutic effects (2). These two interventions have been combined to maximize possibilities for long-term stability without requiring invasive surgical procedures. ABI reduces the frequency and severity of dislocation episodes under clinical trial conditions. In a study by Amer et al. (3), 80% of their study patients reported improvement in their symptoms after the first session. Consistent with the theoretical mechanism of stabilization due to fibrosis-induced stabilization, the authors reported a correlation between decreased joint mobility and symptomatic relief.

In previously reported studies using conservative measures, including splint use and behavioral therapy, ABI has previously outperformed in both comparative analyses of chronic dislocation treatment 4). Goyal et al. reported that ABI is more effective in moderate to severe cases, indicating that joint hypermobility is an important predictor of therapeutic outcome (5). Additionally, there are variations in the technique, such as injecting into the superior joint space alone or with the pericapsular tissues to maximize results. It has been shown by Rashid et al. that injection in both sites results in a greater reduction in maximal mouth opening and a lower recurrence rate (6). This further supports the idea that broader targeting of the fibrous structures around the TMJ will provide better joint stabilization. These findings have been followed by experience with case reports and small series that have firmly established the safety and efficacy of ABI as a minimally invasive intervention (7).

In the setting of chronic dislocation, traditional surgical options for refractory cases have included eminectomy. Nevertheless, comparative data demonstrate that ABI has comparable success rates with fewer complications and less patient morbidity (8). Randomized clinical trials comparing ABI with alternatives to Injectable agents have also been conducted in dextrose prolotherapy. While both treatments improved joint stability, ABI had a faster onset of symptom relief with longer-lasting effects (9). With increasing emphasis on the role of injectable therapies in the broader field of TMJ management, this thesis aims to examine how these therapies have changed over the last decade. Reviews and meta-analyses note that ABI is associated with favorable outcomes, alone or combined with other modalities such as arthrocentesis or physical immobilization (10). Specifically, Turosz et al. pointed out that the combination of lavage treated with ABI promotes a better therapeutic effect, both mechanically and biochemically (11). PpIntegrating treatment strategies to engage with a biologically based, minimally invasive paradigm shift.

The biological underpinnings of ABI have also been explored in recent literature. In clinical settings, the prolonged effects observed might have been due to the contribution of the blood-derived growth factors in reducing inflammation and inducing fibrogenesis, as mentioned by Shahidi et al. (12). Like ABI, Darwish pointed out that the therapeutic potential of injectable agents that change joint

biomechanics and reduce joint pain adds to structural stabilization achieved with ABI (13). Further comparative studies further demonstrate that of dextrose prolotherapy, ABI is superior for some clinical parameters, including joint stiffness and recurrence prevention (14). Finally, a comprehensive review by Ghannadpour et al. reviewed data from multiple sources and concluded that ABI is one of the most effective nonsurgical interventions for TMJ disorders, specifically for chronic recurrent dislocation (15). Its simplicity, affordability, and effectiveness make it an ideal addition to the clinician's armamentarium, and when used in conjunction with IMF, it further stabilizes the tooth during the healing phase.

**Objective:** The purpose of this study was to determine the effectiveness of autologous blood injection when combined with intermaxillary fixation in reducing the frequency and degree of chronic recurrent temporomandibular joint dislocation and improving joint stability.

## MATERIALS AND METHODS

**Design:** Prospective Interventional Study.

**Study setting:** The study was conducted at the Oral and Maxillofacial Surgery Department of Abbasi Shaheed Hospital, Karachi, Pakistan.

**Duration:** The study conducted in the duration from 12 November, 2024 to 13 February, 2025.

**Inclusion Criteria:**

All patients aged 18–60 years are diagnosed with chronic recurrent TMJ dislocation (more than three dislocation episodes for 6 months) and give informed consent. All participants, both male and female, are fit for minor surgical procedures under local anesthesia.

**Exclusion Criteria**

Individuals with a history of TMJ ankylosis, acute infection in the TMJ region, systemic bleeding disorders, malignancy, or currently on anticoagulant therapy are excluded from the study. Pregnant women are also excluded.

### Methods

Patients fulfilling the inclusion criteria were selected after obtaining informed consent. Under aseptic conditions and local anesthesia, 2 ml of autologous blood was drawn from the patient’s antecubital vein and injected into the superior joint space of the affected TMJ using a 21-gauge needle. An additional 1 ml was injected into the pericapsular tissue to enhance fibrosis and stabilization. Immediately following the injection, intermaxillary fixation (IMF) was applied using IMF screws to immobilize the mandible and limit joint movement. The IMF was maintained for 2 weeks, during which patients were kept on a soft diet and instructed on oral hygiene maintenance. After removal of IMF, patients were followed up weekly for the first month, and then monthly for three months. Outcomes were assessed based on the reduction in mouth opening, frequency of dislocation episodes, and patient-reported symptoms. Any complications or adverse events were recorded and managed accordingly.

## RESULTS

A total of 30 patients were included in the study, consisting of 17 females (56.7%) and 13 males (43.3%), with a mean age of 36.4 ± 9.2 years. All patients presented with a history of recurrent TMJ dislocation, with a mean frequency of 4.6 episodes in the last six months prior to treatment. The majority (66.7%) had bilateral involvement, while 33.3% had unilateral dislocation.

**Table 1: Demographic and Baseline Clinical Characteristics of Patients**

| Parameter | Value |
|---|---|
| Total patients | 30 |
| Mean age (years) | 36.4 ± 9.2 |
| Gender (Male/Female) | 13 (43.3%) / 17 (56.7%) |
| Unilateral dislocation | 10 (33.3%) |
| Bilateral dislocation | 20 (66.7%) |
| Mean episodes in 6 months | 4.6 ± 1.1 |

Post-treatment evaluation showed a marked reduction in the frequency of dislocation episodes. At 1-month follow-up, 26 patients (86.7%) reported no dislocation episodes, while the remaining 4 patients (13.3%) experienced only one mild episode, indicating a significant clinical improvement. This trend was sustained through the 3-month follow-up, with 24 patients (80%) remaining completely episode-free.

**Table 2: Dislocation Frequency Before and After Treatment**

| Follow-Up Time | No. of Patients with Dislocation | Mean Episodes |
|---|---|---|
| Pre-treatment | 30 (100%) | 4.6 |
| 1-month follow-up | 4 (13.3%) | 0.2 |
| 3-month follow-up | 6 (20.0%) | 0.4 |

Maximum interincisal mouth opening (MIO) was recorded before treatment and at each follow-up. The mean MIO reduced from 46.2 mm pre-treatment to 38.1 mm at 1 month and stabilized at 39.3 mm at 3 months. This controlled limitation of movement is consistent with fibrosis-induced joint stabilization. Patient-reported pain and discomfort also significantly declined, with 83.3% of patients reporting complete symptom relief by the third follow-up.

**Table 3: Changes in Maximum Interincisal Opening (MIO)**

| Time Point | Mean MIO (mm) |
|---|---|
| Pre-treatment | 46.2 |
| 1-month follow-up | 38.1 |
| 3-month follow-up | 39.3 |

No major complications were reported. Minor transient discomfort at the injection site was experienced by 5 patients (16.7%), which resolved without intervention. IMF screws were well tolerated, and no cases of infection or hardware-related complications were observed. The combined use of autologous blood injection with IMF thus proved to be effective and safe in the management of chronic recurrent TMJ dislocation in this cohort.

## DISCUSSION

Chronic recurrent temporomandibular joint (TMJ) dislocation remains a clinical challenge because it is recurrent, and conservative therapies are limited. Due to its minimally invasive nature, autologous blood injection (ABI) has become a technique used to generate fibrosis in the joint capsule to restrict excessive translational movements of the mandibular condyle. The efficacy of combining ABI with intermaxillary fixation (IMF) was evaluated in a study of chronic recurrent TMJ dislocation patients. As a combined approach, our results showed a reduction of dislocation episodes and a return of joint stability, consistent with the evidence that the growth of this approach is effective and safe.

ABI induces an inflammatory response that leads to fibrosis and scarring of the joint capsule and pericapsular tissues. Chęciński et al. characterized ABI as a positive phenomenon confirmed in a

systematic review by observing positive outcomes, especially if ABI sessions are repeated on a schedule that depends on the severity (1). In our study, small group sizes (10 patients) were trained to the ABI quickly using only a single session of ABI combined with a short period of IMF. They found that less than 80% of patients were free of dislocation episodes at three months' follow-up. These conclusions are similar to those of Ertaş et al., who showed that IMF improved the fibrous adhesion formation by limiting mandibular movement after injection and led to greater stability over time (2).
In addition, Amer et al. stressed the necessity of joint immobilization following ABI in order to achieve better treatment results (3). IMF was immediately administered following ABI and maintained for 2 weeks to allow time for the inflammatory and healing processes to stimulate capsular fibrosis. Shah et al. explored the idea of pericapsular injection to stabilize, making it appear to target the surrounding supportive tissues (4). Our outcomes align with this finding, as patients experienced not only a reduction in dislocation frequency but also improved subjective stability. The efficacy of ABI has been shown to vary based on the severity and chronicity of dislocations. Goyal et al. suggested that patients with moderate chronic dislocation benefit more from ABI than those with extreme hypermobility (5). Our sample primarily included patients with recurrent but not severely hypermobile joints, which may explain the favorable results.
Rashid et al. also demonstrated that injecting both the superior joint space and pericapsular tissue leads to a more pronounced reduction in mouth opening and increased joint stiffness, both of which contribute to functional stability (6). This was reflected in our results, where the maximum interincisal opening decreased post-treatment but remained within a functional range, ensuring preservation of mastication and speech capabilities. Case reports and small trials, such as the one by Roy et al., have also indicated the benefits of ABI in isolated patient scenarios (7). However, such anecdotal evidence, while supportive, must be interpreted with caution. Our study adds to the evidence by providing structured follow-up data in a larger cohort. Comparisons with surgical interventions like eminectomy, as described by Fayed and Ahmed, suggest that while surgery may offer definitive correction, ABI combined with IMF presents a less invasive alternative with fewer complications and a lower cost burden (8).
The discussion on alternative injection therapies, such as dextrose prolotherapy, remains active in the literature. Chhapane et al. compared dextrose and ABI, finding comparable outcomes with both agents (9). However, given the autologous nature of blood, its cost-effectiveness, and minimal risk of allergic reaction, it remains a favorable option in resource-limited settings. Furthermore, Turosz et al. highlighted the broader role of joint injections, including saline, corticosteroids, and hyaluronic acid, but noted that ABI specifically addresses hypermobility through fibrosis rather than symptom suppression (10, 11). Shahidi et al. emphasized the role of biological therapies in TMJ disorders, pointing toward a trend in regenerative and reparative approaches (12). ABI represents an early form of such biological treatment, relying on the body's own healing mechanisms. Our study reinforces this perspective, as patients showed sustained improvement without pharmacologic or surgical interventions.
Similarly, Darwish’s systematic review confirmed that injectable therapies can provide meaningful symptom relief and structural improvement in TMJ disorders, though ABI is unique in its dual mechanical and biological action (13). Pandey et al. compared blood and dextrose prolotherapy, noting that both therapies led to reduced recurrence rates and better patient satisfaction when combined with brief mandibular immobilization (14). Our inclusion of IMF thus appears justified, as it likely played a crucial role in our favorable outcomes. Ghannadpour et al. further supported the concept that blood-derived therapies, including platelet-rich plasma and whole blood, have promising potential in joint stabilization and tissue repair (15). While our study did not use advanced blood derivatives, the effectiveness of whole blood alone is encouraging for settings where more complex preparations are unavailable.
Our findings also favor the use of autologous blood injection in conjunction with intermaxillary fixation as a relatively safe, minimally invasive, and effective modality of treatment for chronic recurrent TMJ dislocation. This method's high rate of treatment success with minimal complications

and maintenance of jaw function makes it a feasible and practical replacement for surgical intervention. Longer follow-up studies comparing prolotherapy with other prolotherapy agents can better define patient selection criteria and optimize treatment protocols.

## CONCLUSION

Finally, the use of autologous blood injection (ABI) in conjunction with intermaxillary fixation (IMF) can be the least invasive and promising treatment in case of chronic recurrent temporomandibular joint (TMJ) dislocation. At three months post-treatment, 80% of patients remained dislocation-free, and significant improvements were also seen in the frequency of dislocation episodes, joint stability, and patient-reported symptoms. ABI may induce fibrosis and provide capsular stabilization, but IMF limits mandibular movement in the critical early healing period. The procedure also had minimal complications. In these patients, ABI and IMF represent an effective, safe, and cost-efficient alternative to more invasive surgical procedures and yield important advantages. Future studies with larger sample sizes, longer follow-up periods, and optimal treatment protocols need to confirm these findings.

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