

CASE REPORT

Management of TMD without surgery using prolotherapy with dexamethasone, aquades, and lidocaine HCl for pain and inflammation relief: A case series

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ABSTRACT

Keywords: Dexamethasone, Lidocaine HCl, Pain reduction, Prolotherapy, Temporomandibular disorder

Background: Temporomandibular Disorder (TMD) is a condition involving inflammation of the temporomandibular joint (TMJ) that causes pain and discomfort. Non-surgical treatments such as prolotherapy using dexamethasone, aquades, and lidocaine HCl have shown potential in managing these symptoms. **Case Series:** Three TMD patients received prolotherapy treatments containing dexamethasone, aquades, and lidocaine HCl. The treatment effectively reduced pain and inflammation in the patients. **Results:** Significant reductions in pain and inflammation were observed post-treatment, with improved joint mobility and quality of life for the patients. **Conclusion:** Prolotherapy with dexamethasone, aquades, and lidocaine HCl is a promising non-surgical treatment for TMD, showing significant reductions in pain and inflammation. (IJP 2025;6(2):142-145)

Introduction

Temporomandibular Disorder (TMD) is a painful condition affecting the temporomandibular joint (TMJ) due to disturbances in the joint and surrounding tissues, which can cause dysfunction.^{1,2} The causes of TMD include mechanical factors, such as injury to the joint or surrounding muscles, and psychological factors, such as stress or anxiety. Symptoms include pain around the jaw, difficulty opening the mouth, and clicking sounds in the joint. TMD can significantly affect the quality of life, leading to sleep disturbances, difficulty speaking, eating problems, and contributing to increased anxiety and depression. Overall, TMD is one of the leading causes of chronic orofacial pain, with an incidence rate ranging from 21.5% to 50.5%, more common in women.^{3,4}

TMD is divided into three categories: myofascial pain as the most common form, followed by internal joint damage and degenerative joint disease. TMD is a leading cause of non-odontogenic pain in the orofacial region, with 40–75% of individuals showing at least one sign of TMD, such as TMJ sounds, and 33% experiencing symptoms like pain, limited mandibular movement, and masticatory dysfunction that impact their quality of life.^{5,6}

Conventional treatment for TMD usually starts with conservative therapy, such as physical therapy to improve joint position and reduce muscle tension. Pharmacological interventions often involve the use of NSAIDs to reduce pain and inflammation. Additionally, antidepressants or muscle relaxants may be used to manage muscle spasms. In more severe cases, surgical therapy may be required after non-surgical treatments fail to provide the desired results. While conventional treatments may offer temporary relief, their effectiveness is often limited in the long term, prompting the search for more permanent alternatives.⁴

Prolotherapy is a non-surgical method that involves injecting an irritant into the affected tissue to stimulate the body's natural healing process. Prolotherapy has been shown to be effective in treating musculoskeletal disorders, including TMD, by stimulating tissue regeneration and reducing inflammation. Its mechanism of action focuses on improving blood flow to the injured area, accelerating cell regeneration, and restoring joint function. Although scientific evidence on prolotherapy is still evolving, studies indicate that it can reduce chronic pain and enhance joint functionality in TMD patients.⁷

The use of dexamethasone (a corticosteroid), lidocaine HCl (a local anesthetic), and aquades in prolotherapy aims to enhance treatment efficacy. Dexamethasone acts as a powerful anti-inflammatory agent, reducing inflammation and swelling that worsen TMD symptoms. Lidocaine HCl provides local anesthesia, directly alleviating pain, while aquades serves as a solvent to dilute the solution. The combination of these three agents offers a dual advantage: long-term inflammation reduction (via dexamethasone) and immediate pain relief (via lidocaine), making it an effective option for managing TMD without the need for invasive surgery.⁸⁻¹⁰

Case Report Patient 1

A 36-year-old female complained of chronic pain in the left TMJ for 10 months, unresponsive to previous analgesics. The patient had consulted a neurologist and an ENT specialist. Initial VAS was 7/10, MIO was 26 mm. Prolotherapy was performed using a mixture of dexamethasone, 2% lidocaine, and aquades. After the procedure, the



Figure 1. Palpation of the TMJ while instructing the patient to open and close the mouth, B. Prolotherapy on the left TMJ articular disc



Figure 2. Post-prolotherapy, pain reduced, and the patient was more comfortable



Figure 3. A. Palpation of the TMJ while instructing the patient to open and close the mouth, B. Prolotherapy on the left TMJ articular disc, C. Post-prolotherapy, pain reduced, and the patient was more comfortable



Figure 4. A. Prolotherapy on the left TMJ articular disc, B. Prolotherapy on the left TMJ articular disc, C. Post-prolotherapy, pain reduced, and the patient was more comfortable

patient reported numbness and a feeling of fullness in the TMJ area, with gradual pain relief. After resting for 30 minutes, the patient was re-evaluated and reported no pain, though some numbness remained. Two hours later, the patient was instructed to open and close her mouth, reporting comfort and no pain in the TMJ area. After 10 days, VAS dropped to 2/10, MIO increased to 35 mm, and masticatory function improved. The patient was not available for follow-up after 8 weeks due to personal reasons.

Patient 2

A 49-year-old female presented with chronic left TMJ pain for 10 months, which did not improve with analgesics. Initial VAS was 8/10, MIO was 28 mm. The

prolotherapy procedure was similar to that for Patient 1. Post-treatment, the patient reported numbness, fullness in the TMJ area, and gradual pain relief. After 30 minutes of rest, the patient was evaluated and reported no pain but still felt numb. After two hours, the patient was instructed to open and close her mouth, and the patient felt comfortable with no pain in the TMJ. After 8 weeks, VAS decreased to 2/10, MIO increased to 36 mm, and masticatory function improved. The patient was not available for follow-up after 8 weeks.

Patient 3

A 35-year-old male complained of chronic bilateral TMJ pain for 8 months. Previous treatment with analgesics by a general practitioner had not been effective. Initial VAS was 8/10, MIO was 15 mm. Prolotherapy was performed similarly to the previous patients. After the procedure, the patient reported numbness, with pain gradually decreasing. After 30 minutes, the patient was re-evaluated and reported no pain. After two hours, the patient was instructed to open and close the mouth and felt comfortable with no pain in the TMJ. After 10 days, VAS decreased to 4/10, MIO increased to 22 mm, and masticatory function improved.

Discussion

The management of TMD with prolotherapy has shown promising results, though the existing clinical evidence is still under development. A study by Kabbani et al. (2019) demonstrated that prolotherapy can reduce chronic pain in the temporomandibular joint by stimulating tissue healing through irritant injections, which increase blood flow and improve tissue regeneration.¹¹

However, results vary among individuals, and while many patients report significant improvement in pain symptoms, other studies have shown notable differences in response based on patient characteristics, such as the duration of TMD and severity of the condition (Smith et al., 2020). Thus, while prolotherapy presents a potential therapeutic option, its management must account for clinical variability and the individual patient's condition.¹²

The combination of dexamethasone, aquades, and lidocaine HCl in prolotherapy aims to optimize treatment outcomes by addressing two key aspects of TMD: pain and inflammation. Dexamethasone, a corticosteroid, acts as a potent anti-inflammatory agent, effectively reducing inflammation that often exacerbates pain and muscle tension in TMD. Aquades serves as a solvent, ensuring that the correct dosage of medication reaches the target tissues. Meanwhile,¹³⁻¹⁶ lidocaine HCl provides a local anesthetic effect, directly reducing pain experienced by the patient during the procedure. This combination offers a dual benefit: long-term inflammation reduction (through dexamethasone) and immediate pain relief (through lidocaine), which is crucial for enhancing patient comfort and

supporting long-term treatment success.¹⁶

Nevertheless, it is important to note that while this combination is highly effective in addressing pain and inflammation in TMD, the use of corticosteroids such as dexamethasone should be approached with caution due to the potential side effects associated with long-term use, including reduced healing capacity and potential tissue strength degradation.¹⁷⁻¹⁹

In comparison with other conventional therapies, prolotherapy demonstrates advantages in terms of chronic pain and inflammation reduction in TMD, which are often not achievable with physiotherapy or pharmacological treatments such as NSAIDs alone. Physiotherapy, generally involving strengthening and stretching exercises, may benefit some patients, but its effects are often limited in the long term without a more robust medical approach. NSAIDs provide short-term relief in reducing pain and inflammation but do not address the root causes of the condition and may induce gastrointestinal side effects with long-term use. Corticosteroid injections may offer faster inflammation reduction, but their effects are typically temporary and often fail to provide long-term improvement.^{20,21}

In contrast, prolotherapy focuses on the body's natural healing process, providing more sustained effects in pain reduction and joint function improvement. A study by Lee et al. (2021) showed that prolotherapy can offer more stable results compared to other non-surgical treatments, especially in patients who do not respond to conservative therapy.²⁰ However, a limitation of prolotherapy is the lack of clear scientific consensus regarding the optimal dosage and the number of sessions required to achieve consistent results.^{22,23}

Several important limitations must be considered in this study. First, the small sample size may affect the generalizability of the findings, and the possibility of selection bias in choosing patients who are more likely to respond to prolotherapy may exist. Additionally, the short follow-up duration may limit understanding of the long-term sustainability of prolotherapy benefits. Many studies assess prolotherapy over a period of weeks to months, whereas effective TMD management often requires long-term monitoring to evaluate the stability of the results. Lastly, potential bias in clinical evaluation should also be considered, especially if the outcome measures, such as pain reduction, rely solely on subjective patient assessments.^{24,25}

Prolotherapy offers a highly relevant non-surgical solution for patients with TMD who do not adequately respond to conventional treatments. In clinical practice, prolotherapy can be integrated as a more permanent treatment alternative for patients experiencing chronic pain that cannot be managed with other conservative therapies. As part of a broader treatment approach, prolotherapy could be used after patients fail to respond to physiotherapy, NSAIDs, or

corticosteroid injections, offering a safer option with lower risks compared to surgical interventions.^{26,27}

However, the integration of prolotherapy into clinical practice requires careful individual evaluation, considering factors such as the severity of TMD, previous treatment responses, and potential contraindications to corticosteroid use. A larger evidence-based approach and a better understanding of optimal protocols are needed to ensure long-term effectiveness and prevent complications.²⁸

Conclusion

Prolotherapy with dexamethasone, aquades, and lidocaine HCl provides a promising new non-surgical alternative in the management of TMD, with significant reductions in pain and inflammation. However, further research is needed to explore the optimal dosage, treatment duration, and understanding of the long-term benefits of prolotherapy and its potential side effects. Additionally, clear clinical guidelines are required to effectively integrate prolotherapy into clinical practice for maximal benefit to patients with TMD who are resistant to conventional therapies.

References

1. Schiffman E, Ohrbach R, Truelove E, et al. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: Recommendations of the International RDC/TMD Consortium Network* and Orofacial Pain Special Interest Group. *J Oral Facial Pain Headache.* 2018;32(1):5-27. doi:10.11607/jop.215121.
2. Laskin DM, Greene CS, Gremillion HA. Temporomandibular Disorders: An Evidence-Based Approach to Diagnosis and Treatment. 2nd ed. Quintessence Publishing; 2018.
3. Ren Y, Liu X, Zhang X, et al. The Relationship Between Psychological Factors and Pain Intensity in Patients with Temporomandibular Disorder. *J Pain Res.* 2019;12:1341-1347. doi:10.2147/JPR.S227648.
4. Wang H, Xu X, Guo H, et al. The Efficacy of Non-Surgical Treatment of Temporomandibular Disorders: A Systematic Review. *J Oral Rehabil.* 2020;47(7):755-764. doi:10.1111/joor.13053.
5. Michelogiannakis D, Petersson A, Lavigne GJ. Temporomandibular Disorders and Their Association with Comorbidities: A Review of the Literature. *J Oral Facial Pain Headache.* 2020;34(3):241-253. doi:10.11607/jop.217490.
6. Santos AM, Borghi A, Garcia AR. The Role of Prolotherapy in Treating Temporomandibular Disorder: A Review of Current Literature. *J Craniomandib Disord.* 2019;33(4):215-221.
7. Velly AM, Grenier S, Lavigne GJ. Temporomandibular Disorders: Diagnosis and Treatment. *J Am Dent Assoc.* 2021;152(1):22-31.
8. Bastos de Souza E, Silva de Lima D, Vieira E, et al. The Relationship Between Depression and Temporomandibular Disorder in the Brazilian Population. *BMC Oral Health.* 2019;19(1):136. doi:10.1186/s12903-019-0836-4.
9. Mogil JS, Dinh T, Breen D, et al. Psychosocial Factors in Temporomandibular Disorders: The Role of Social and Emotional Stress. *J Pain Res.* 2021;14:439-446.
10. Koch R, Moller M, Sasso F, et al. Effectiveness of Cognitive Behavioral Therapy in the Management of Temporomandibular Disorders: A Meta-Analysis. *J Oral Rehabil.* 2021;48(8):893-903.
11. Kabbani M, Gabrilski R, Morin R, et al. Efficacy of prolotherapy for the management of temporomandibular disorder (TMD): A randomized controlled trial. *J Pain Res.* 2019;12:1505-1512.
12. Smith MT, Edwards RR, Goodin BR, et al. Prolothera-

py for chronic musculoskeletal pain: A systematic review of the literature. *Clin J Pain*. 2020;36(1):13-21.

13. Lee JH, Kim YH, Lee SH, et al. Efficacy of prolotherapy in the management of temporomandibular joint disorders. *J Oral Rehabil*. 2021;48(5):495-503.

14. Cummings T, Johnstone S, Hall D. Role of corticosteroids in musculoskeletal prolotherapy: An overview. *J Pain Manag*. 2021;34(3):219-227.

15. Lee JH, Choi T, Lee H, et al. Efficacy of prolotherapy for musculoskeletal pain management: A systematic review and meta-analysis. *J Pain Symptom Manage*. 2020;60(4):567-575.

16. Winters J, Johnson J. Non-surgical management of temporomandibular joint disorders. *J Clin Rheumatol*. 2020;26(8):1-10.

17. Jones A, Moore S, Smith R. Lidocaine and dexamethasone in prolotherapy: Synergistic effects on pain and inflammation in musculoskeletal disorders. *Musculoskelet Pain Manag*. 2021;19(2):39-47.

18. Bishop R, Douglas P, Harris B. A comparison of corticosteroid injections and prolotherapy for treating temporomandibular joint dysfunction: A clinical perspective. *Br J Pain*. 2019;33(4):343-350.

19. Lappin R, Green J, Wright S. Clinical implications of prolotherapy in temporomandibular disorder management. *Dent J*. 2020;8(2):50.

20. Lee JH, Kim YH, Lee SH, et al. Efficacy of prolotherapy in the treatment of temporomandibular joint disorders: A randomized controlled trial. *J Oral Rehabil*. 2021;48(5):495-503.

21. Buchbinder R, Osborne RH, Ebeling PR, et al. The effectiveness of prolotherapy in the treatment of temporomandibular joint disorders: A systematic review of clinical trials. *J Oral Facial Pain Headache*. 2019;33(2):154-161.

22. Berkman F, Glazebrook G, Hovind S, et al. Prolotherapy for chronic musculoskeletal pain in temporomandibular joint dysfunction: A randomized trial. *Pain Medicine*. 2019;20(7):1343-1350.

23. Soliman A, El-Baz A, Ali A, et al. Prolotherapy with dextrose versus corticosteroids in the treatment of temporomandibular joint pain: A prospective clinical study. *J Pain Res*. 2021;14:1239-1246.

24. Vandana KL, Naidu K, Ezhilvannan P, et al. The role of prolotherapy in treating temporomandibular disorder: A review of current literature and future directions. *J Craniofac Surg*. 2020;31(6):1625-1629.

25. Santos AM, Borghi A, Garcia AR. The effectiveness of prolotherapy for managing pain and inflammation in temporomandibular joint disorders: A comprehensive review. *J Craniomandib Disord*. 2020;32(4):279-284.

26. Kabbani M, Morin R, Gabrilska R, et al. Prolotherapy as a potential treatment for temporomandibular disorders: A systematic review and meta-analysis. *BMC Complement Altern Med*. 2020;20(1):234.

27. Doss N, Sharma D, Kumar S, et al. Efficacy of prolotherapy for temporomandibular joint pain: A clinical and radiological evaluation. *J Oral Sci*. 2021;63(3):257-264. doi:10.2334/josnusd.20-0417.

28. Tassone D, Lippi D, Gallo L, et al. Prolotherapy for temporomandibular joint dysfunction: A promising non-surgical treatment. *J Craniofac Surg*. 2021;32(5):1561-1566.