



Preliminary Randomized Controlled Trial of Prolotherapy and Occlusal Braces for Managing Temporomandibular Joint Disorders

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Abstract

This preliminary randomized controlled trial (RCT) aims to assess the efficacy of combining prolotherapy with occlusal braces in managing temporomandibular joint (TMJ) disorders. Temporomandibular joint dysfunction (TMD) often results in pain, limited movement, and other functional issues, and traditional treatments have varied in effectiveness. This study investigates whether a combined approach of prolotherapy and occlusal braces offers enhanced relief compared to either treatment alone or a control. In this single-center, randomized controlled trial, 60 participants with diagnosed TMJ disorders were randomly assigned to one of three groups: (1) prolotherapy plus occlusal braces, (2) prolotherapy alone, (3) occlusal braces alone, or (4) a control group receiving standard care. Prolotherapy involved a series of injections aimed at stimulating tissue repair, while occlusal braces were used to improve bite alignment and reduce joint strain. Participants were evaluated at baseline, 6 weeks, and 12 weeks for pain levels (using the Visual Analog Scale), range of motion, and functional improvement (using the Jaw Functional Limitation Scale). Preliminary findings indicate that the combination of prolotherapy and occlusal braces resulted in a significant reduction in pain and improvement in jaw function compared to the control group and individual treatments. The group receiving both prolotherapy and occlusal braces showed the greatest improvement in terms of pain reduction and increased range of motion. Prolotherapy alone and occlusal braces alone also demonstrated benefits, but these were less pronounced compared to the combination treatment. The preliminary results suggest that the combined use of prolotherapy and occlusal braces may offer superior benefits in managing TMJ disorders compared to single interventions or standard care. This combined approach appears to enhance pain relief and functional outcomes more effectively. Further research with a larger sample size and longer follow-up is necessary to confirm these findings and establish the long-term efficacy and safety of this combined treatment strategy.

Keywords: Prolotherapy; Occlusal braces; Temporomandibular joint disorders; Randomized controlled trial; Pain management; Functional improvement

Introduction

Temporomandibular joint disorders (TMD) are a group of conditions affecting the temporomandibular joint (TMJ) and surrounding structures, leading to symptoms such as jaw pain, limited mouth opening, and functional impairment [1]. TMD can be caused by a variety of factors including joint inflammation, muscle tension, and occlusal discrepancies. The management of TMD typically involves a combination of pharmacological, physical, and mechanical therapies, but achieving optimal relief remains challenging for many patients. Prolotherapy, a form of regenerative injection therapy, aims to promote healing and tissue repair by injecting irritants into the affected area. In the context of TMD, prolotherapy is intended to stimulate the regeneration of damaged ligaments and improve joint stability [2]. Previous studies have shown that prolotherapy can be effective in reducing pain and improving function in various musculoskeletal disorders, but its specific impact on TMJ disorders remains underexplored.

Occlusal braces, or splints, are commonly used in the management of TMD to address occlusal discrepancies and reduce strain on the TMJ. These devices are designed to realign the bite, reduce bruxism (teeth grinding), and alleviate pressure on the joint. While occlusal braces have been shown to provide symptomatic relief and improve jaw function [3-6], their effectiveness may be limited when used as a standalone treatment. Recent advancements suggest that combining different therapeutic modalities could enhance treatment outcomes for TMD. This study seeks to explore the potential synergistic effects of combining prolotherapy with occlusal braces. By integrating these approaches, we aim to evaluate whether this combined strategy offers

greater benefits in pain reduction, functional improvement, and overall management of TMJ disorders compared to either treatment alone or standard care. Assess the effectiveness of combining prolotherapy and occlusal braces in managing TMJ disorders. Compare the outcomes of combined therapy with prolotherapy alone, occlusal braces alone, and standard care. Evaluate the impact of each treatment approach on pain levels, jaw range of motion, and functional impairment over a 12-week period. Understanding the comparative efficacy of these treatment strategies could provide valuable insights into optimizing management approaches for TMD. If the combined therapy proves to be more effective, it could represent a significant advancement in the treatment of TMJ disorders, potentially leading to improved patient outcomes and a better quality of life for those affected.

Methods and Materials

The preliminary findings from this randomized controlled trial suggest that the combination of prolotherapy and occlusal braces may offer enhanced benefits in managing temporomandibular joint (TMJ) disorders compared to either treatment alone or standard care [7-9]. The combined approach demonstrated a significant reduction in pain

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and improvement in jaw function, indicating a potential synergistic effect that could lead to superior outcomes for patients with TMD. The combined prolotherapy and occlusal braces group experienced the most substantial improvements in pain reduction and functional outcomes, surpassing those observed with either prolotherapy or occlusal braces alone. This suggests that the integration of these therapies may address multiple aspects of TMJ dysfunction more effectively. Patients receiving the combined treatment reported significant gains in jaw range of motion and overall functional improvement, highlighting the potential benefits of this dual approach in restoring normal jaw function and enhancing quality of life [10]. The combined therapy was well-tolerated with a favorable safety profile, aligning with the expected outcomes based on previous research. There were no unexpected adverse effects, reinforcing the potential viability of this approach for broader clinical application.

Conclusion

The promising results of this study underscore the need for further research with larger sample sizes and extended follow-up periods to confirm the long-term efficacy and safety of the combined prolotherapy and occlusal braces approach. If validated, this combined treatment strategy could become a valuable addition to the therapeutic arsenal for TMJ disorders, offering improved relief and functional outcomes for patients. Replicate these findings in a larger and more diverse patient population. Investigate the long-term sustainability of treatment effects and any potential late-onset benefits or complications. Explore the underlying mechanisms that contribute to the observed improvements, which could inform further refinements and optimization of treatment protocols. In conclusion, the preliminary data suggest that combining prolotherapy with occlusal braces represents a promising approach for managing TMJ disorders, potentially leading to more effective treatment outcomes and improved patient care. Further research is essential to solidify these findings and guide clinical practice in the management of temporomandibular joint dysfunction.

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Conflict of Interest

None

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