

UNIVERSITI TEKNOLOGI MARA

**THE EFFECT OF ORTHODONTIC
INTRUSION ON PERIODONTALLY-
COMPROMISED TEETH: A
SYSTEMATIC REVIEW AND META-
ANALYSIS**

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ABSTRACT

This study systematically reviewed and meta-analysed the impact of orthodontic intrusion on teeth compromised by periodontal disease with pathological tooth migration (PTM). A comprehensive search was conducted across 6 databases (PubMed, Scopus, Web of Sciences, Scopus, Wiley, Cochrane and Google Scholar). Utilizing the PICO (Patient, Intervention, Comparator, Outcome) frameworks to guide search strategy development by identifying key terms for databases. Two independent reviewers screened studies, extracted data, and assessed quality using predefined criteria. The primary outcome of interest includes changes in probing pocket depth (PPD) and clinical attachment level (CAL). Meta-analysis was performed to pool the data. Subgroup analyses were conducted to explore the effect of the treatment timing and biomechanical approach. Most included studies with moderate to high quality, demonstrated significant improvement of PPD and CAL following orthodontic intrusion. The meta-analysis of two studies found no significant additional reduction in PPD among patients undergoing combined orthodontic-periodontal treatments compared to those receiving periodontal treatment alone. Single-arm meta-analyses showed statistically significant improvement in CAL and PPD with high heterogeneity noted among studies. Subgroup analyses indicated that optimal clinical outcomes may be achieved through immediate/ simultaneous timing and segmental/ partial/ sectional approaches. These findings suggested the timing and biomechanic approach of orthodontic intrusion may enhance therapeutic efficacy. There was high heterogeneity noted across studies, moderate to high precision and potential publication bias. This review concluded that the orthodontic intrusion may help in improving periodontal health with optimal results can be achieved via early intervention and segmental approach. However, these findings should be interpreted with cautions and more comprehensive research is needed to draw a definitive conclusion about the safety of the intervention. This insight gained may guide treatment protocols, improve patients' outcomes, and influence the best practices in clinical orthodontics and periodontology.

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CHAPTER 1

INTRODUCTION

1.1 Opening

Orthodontics stands as a transformative force, shaping not only the alignment of teeth but also the foundations of oral health and well-being (Ferrando-Magraner et al., 2019; Proffit et al., 2019). This dissertation explored the complex and dynamic interaction between orthodontic incorporating intrusion techniques, revealed their effects on teeth in the context of compromised periodontal health. As orthodontic science advances, increasing attention is being directed toward cases where the stability of oral health is intricately maintained. The challenge is clear: how can orthodontic interventions, such as intrusion movement, be optimized to achieve not only the desired alignment but also the harmonious coexistence with compromised periodontal structures?

This dissertation aimed to redefine the orthodontic intrusion as more than an occlusal correction method, but as a therapeutic approach in comprehensive periodontal-orthodontic care.

1.2 Background and Context: Motivation for This Work

The motivation for this work arises from the need to bridge the gap between achieving optimal tooth alignment and preserving the integrity of the supporting periodontal structures, a balance that is critical to ensuring long-term oral health and function. By exploring the foundational principles of orthodontics and periodontics, as well as the unique complexities of treating compromised cases, this study aimed to contribute valuable insights to the interdisciplinary field of dental care, promoting a deeper understanding of the interplay between these specialized disciplines.

1.2.1 Overview of Orthodontic and its Significance

Orthodontics stands as a highly specialized discipline within dentistry, focusing on the meticulous diagnosis, prevention, and treatment of irregularities pertaining to