

Title: In vitro Assessment of the Antimicrobial Properties of Orthodontic Bonding Materials

Author: Alam, Mohammad K., Hajeer, Mohammad Y., Alfuhigi, Mashael Z., Eldosary, Faisal A., Alsenani, Faisal N., Alsayil, Lama N.

Abstract: Orthodontic bonding materials are extensively used in dentistry, but their antimicrobial properties are of growing concern due to the risk of biofilm formation and associated complications. Understanding the antimicrobial efficacy of these materials is crucial for maintaining oral health during orthodontic treatment. In this in vitro study, we evaluated the antimicrobial properties of various orthodontic bonding materials against common oral pathogens. Samples of bonding materials were prepared and exposed to microbial strains including *Streptococcus mutans*, *Porphyromonas gingivalis*, and *Candida albicans*. Antimicrobial activity was assessed using agar diffusion assays and microbial viability assays. The tested orthodontic bonding materials exhibited varying degrees of antimicrobial activity. Material A showed a zone of inhibition of 12 mm against *S. mutans*, 8 mm against *P. gingivalis*, and 6 mm against *C. albicans*. Material B exhibited slightly higher antimicrobial activity with inhibition zones of 14 mm, 10 mm, and 8 mm against *S. mutans*, *P. gingivalis*, and *C. albicans*, respectively. Material C displayed the highest antimicrobial activity, with inhibition zones of 16 mm against *S. mutans*, 12 mm against *P. gingivalis*, and 10 mm against *C. albicans*. Microbial viability assays confirmed the efficacy of these materials in reducing microbial growth. Our findings demonstrate that orthodontic bonding materials possess varying degrees of antimicrobial properties. Material C exhibited the highest efficacy against the tested microbial strains. Incorporating antimicrobial agents into orthodontic bonding materials may contribute to the prevention of oral infections during orthodontic treatment.

Keywords: Antimicrobial properties; Biofilm; Dental materials; Oral pathogens; Orthodontic Bonding materials

DOI: https://doi.org/10.4103/jpbs.jpbs_326_24

https://journals.lww.com/jpbs/fulltext/2024/16003/in_vitro_assessment_of_the_antimicrobial.204.aspx