## عنوان مقاله:

Effect of Incorporating Titanium Dioxide Nanoparticles (۱%) on Shear Bond Strength of Orthodontic Composites: An In Vitro Study


## محل انتشار:

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تعداد صفحات اصل مقاله: 5



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## خلاصه مقاله:

Background: Plaque accumulation and bond failure are the drawbacks of fixed orthodontic treatment. Titanium dioxide (TiO۲) could be added to orthodontic composite as an antimicrobial agent, but it may change its mechanical properties. The aim of this study was to evaluate the mechanical properties of orthodontic composite modified by TiO۲ nanoparticles (NPs) after ۱۰ ۰۰۰ cycles of thermocycling. Methods: Overall, ۵۰ intact human premolars (extracted for orthodontic treatment) were used in this study. The orthodontic composite containing TiO۲ NPs (۱% wt) was prepared and used for the bonding of brackets. The bracket/tooth shear bond strength (SBS) was measured by using a universal testing machine before and after ۱۰ ۰۰۰ cycles of thermocycling at ۵ and ۵۵°C (dwell time = ۳۰ seconds). Eventually, the obtained data were analyzed by Student's t test with the Excel software (significance level ≤ ۰.۰۵). Results: After thermocycling, the average SBS of TiO۲ containing and control group was ۱۱.۴۳ ± ۵.۱۸ MPa and ۱۳.۴۶ ± ۵.۱۷ MPa, respectively. The difference in the SBS of the two groups after thermocycling was not significant (P = ۰.۷). The SBS of both groups decreased after thermocycling; however, the reduction was lower in the group with TiO۲ than in the control group. Conclusions: TiO۲-containing composite can be used as an antimicrobial agent in high risk of caries patients without deteriorating the mechanical properties.



## کلمات کلیدی:

Orthodontics, Bonding, Titanium dioxide, Shear strength