

بررسی تأثیر روش recycling شیمیایی بر روی استحکام برشی پیوند براکت های فلزی ارتودنسی

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Title: The effect of chemical recycling on shear bond strength of orthodontic metal brackets

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Background and Aim: Recycling of brackets can significantly reduce the price of fixed orthodontic appliances but if the bond is more prone to failure during treatment, this potential benefit will disappear. The aim of this study was to investigate the effect of chemical recycling on bond strength of metal orthodontic brackets and failure pattern of recycled brackets.

Material and Methods: In this experimental study Instron machine was used to measure shear bond strength (SBS) of brackets in two stages on 60 human maxillary first premolars using No-Mix composite. Shear bond strength and pattern of failure were compared between recycled and new brackets in two stages. Data were analyzed by ANOVA and Duncan tests. Adhesive Remnant Index was evaluated in different groups by Pearson Chi-square test. $P < 0.05$ was considered as the limit of significance.

Results: Statistical analysis showed that the mean values of SBS for new bracket group was 12.00 MPa and for recycled group and double recycled group, 9.94 MPa and 10.00 MPa respectively. A significant reduction (about 18%) in bond strengths of brackets was observed at the first time of recycling. Recycling at the second time had no significant influence on the bond strength. Pattern of bond failure of these brackets showed that a great amount of residual adhesive material was remained on the teeth surfaces after debonding of recycled brackets which indicates that cleaning the teeth surfaces after debonding of recycled brackets is more time consuming.

Conclusion: Based on the results of this study, before using recycled brackets, several advantages and disadvantages must be considered.

Key Words: Metal bracket; Chemical recycling; Shear bond strength

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چکیده

زمینه و هدف: recycling براکت‌ها به دلیل کاهش قابل توجه هزینه دستگاه‌های ثابت ارتودنسی، از دیرباز مورد توجه متخصصان ارتودنسی بوده است. با این وجود اگر باند این براکت‌ها در طی درمان مستعد شکست شود، این مزیت اولیه از بین می‌رود؛ بنابراین داشتن اطلاعات کافی در این زمینه ضروری به نظر می‌رسد. مطالعه حاضر با هدف ارزیابی تأثیر روش recycling شیمیایی بر روی

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