The effects of bracket removal on enamel

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Abstract: Background: Enamel cracks, which may develop during debonding orthodontic brackets, may jeopardise the integrity of the enamel and detract from the appearance of the teeth.

Aim: To compare the adhesive remnant scores (ARI), the number, lengths and directions of enamel cracks before bonding and after debonding metal orthodontic brackets with three different methods.

Methods: Metal brackets were bonded with a self-curing orthodontic adhesive to the buccal surfaces of ٧٥ recently extracted upper and lower premolars. The teeth were randomly divided into three groups, and the brockets removed either with a side-cutter, a single-blade bracket remover or a two-blade bracket remover. The number, directions and lengths of the enamel cracks before bonding and after debonding were compared. The number of 'pronounced' cracks (i.e. cracks that could be identified with the naked eye) and the ARI scores in each group were also compared.

Results: After debonding, the number of enamel cracks and pronounced cracks, and the lengths of the enamel cracks increased in all groups ($p < ٠,٠٠١$). There were no statistically significant differences between the groups. The ARI scores and the direction of propagation of the enamel cracks were not influenced by the debonding method used ($p = ٠,٧٣$).

Conclusions: Concerns about the enamel damage caused by the three methods of debonding justify caution. Despite widespread use of these methods, it would be sensible to search for methods that result in less enamel damage.

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