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Effects of Three Different Types of Intracoronal Bleaching Agents on Shear Bond Strength of Stainless Steel and Sapphire Brackets Bonded to Endodontically Treated Teeth (An In Vitro Study)

A Thesis
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Abstract

Orthodontists may encounter patients who are unsatisfied not only with the alignment but also with the colour of their teeth, therefore; it is important when orthodontist faces patient who needs intracoronal bleaching with orthodontic treatment to know if there is any undesirable effect of intraconal bleaching on shear bond strength(SBS) of orthodontic brackets.

Aims of this study were to evaluate the effects of different intracoronal bleaching agents on the shear bond strengths (SBS) and failure site of stainless steel and monocrystalline (sapphire) orthodontic brackets bonded to endodontically treated teeth using light cured orthodontic adhesive in vitro.

For this goal, eighty extracted sound human upper first premolars were selected, endondontically treated and randomly divided equally (according to the type of the brackets used) into two main groups (n = 40 per group). Each main group were subdivided (according to the bleaching agent used) into four subgroups 10 teeth each; as following : control (un bleached) group, hydrogen peroxide group (Hp) 35%, carbamide peroxide group (CP) 37% group and sodium perborate (SP) group .The bleaching process was applied three times (4 days intervals) sequentially and the bleached teeth were stored in artificial saliva four weeks before bonding. Orthodontic brackets were bonded with a light cure composite resin with an LED light .

After passing 24 hours of bonding procedure, the brackets were debonded by a Tinius-Olsen universal testing machine, to measure the shear bond strength. After debonding, each bracket base and the corresponding tooth surface were examined using a stereomicroscope and their Adhesive Remnant Index (ARI) was recorded.

The results showed that the shear bond strength of stainless brackets was significantly reduced by intracorornal bleaching agents. Furthermore, no significant difference was found between the three types of bleaching agents used in stainless steel group. Whilst for sapphire group, the results showed no significant difference in SBS between the bleached groups and the control group. There was no significant difference in failure site between bleached and control groups in both brackets types used.

In conclusion, the effect of intracoronal bleaching on SBS was reduced SBS of stainless steel and not for sapphire. However, the intracoronal bleaching had no effect on the failure site of orthodontic brackets used.