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ATP Bioluminescence: A clinical tool to measure plaque retention on tooth surface around orthodontic brackets

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Introduction: The purpose of the present study was to quantify dental plaque retention on tooth surface around different types of orthodontic brackets using ATP bioluminescence measurement technique.

Methods: The sample consisted of 30 subjects selected from the out-patient clinic at Orthodontic Department, Faculty of Dentistry, Suez Canal University, Ismailia, Egypt. These selected patients required fixed appliance orthodontic therapy. The subjects were divided into three groups each bonded with different bracket type; stainless steel G1, Ceramic (G2), and self-ligating (G3); each ten subjects. A split mouth design was assigned as half of each arch, either the left or the right side, was randomly assigned to receive the experimental bracket, with the opposite side as the control. For each arch, either the left or the right premolars was selected to receive the experimental measurements. The measurements were in relative light units (RLU) values.

Results: All groups showed non-significant measurements but G2 (ceramic brackets) recorded the highest measurement 104001. 90 ± 17423. 85 and the lowest measurement (36774. 40 ± 8636. 22) was observed in G3 (self-ligating bracket) after 4 weeks.

Conclusion: The Self-ligating brackets are more hygienic. ATP-driven bioluminescence technique could serve as a useful tool in the rapid chair-side quantification of bacterial load and in the assessment and monitoring of oral hygiene during orthodontic treatment.

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