



Evaluation of Micro-hardness, Clarity and Slot roughness of Lithium Disilicate Orthodontic Brackets: (In-vitro study)

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BY

SANA RIZGAR UBAED

B.D.S.

SUPERVISED BY

LECT. OMER SABAH, ALI

B.D.S., M.Sc., Ph.D.

ABSTRACT

Background and objectives: The increase demand of using esthetic brackets and due to no perfect materials present until now, the creation of bracket with new materials is the aim of this study. The main Purpose is to evaluate the micro-hardness, clarity and three-dimensional analysis of roughness of bracket slot of new lithium disilicate(e.max) brackets with two ceramic brackets that are commercially available in the markets.

Materials and Methods: Tested brackets were divided into three groups: (1) E max brackets (IPS e.max press, Ivoclar, Germany). (2) Gemini clear brackets (Unitek, 3M, USA), (3) Discovery pearl ceramic brackets (Dentaurum, Germany). The Vickers hardness test was used to evaluate the micro-hardness of the wings which considered the weakness area in the brackets in addition the light transmission of three bracket types were tested through using an orthodontic light cure device and light meter, The three-dimensional analysis of base of slot of three tested brackets were performed using laser scanning microscope (VK-X). one-way ANOVA and Duncan's multiple range test was used to find significant difference between tested brackets.

Results: The hardness test of Discovery pearl ceramic brackets and Gemini clear brackets gave significantly higher than e.max brackets while later gave significantly more light transmission though It, comparing with other two brackets. The roughness parameter (Sa) showed that the Gemini clear bracket gave the lowest roughness parameter while The Discovery pearl gave the highest roughness parameter.

Conclusion :The noticeable tested brackets made e.max material one of the best choices for modern esthetic brackets in future although the hardness is less comparing the other tested brackets due to the purity of material compering with other test brackets which their pure materials are reinforced, the new material requiring improving of mechanical performances.

Key words: IPS -e-max press, ceramic brackets, Vickers hardness test, translucency.