OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Dental & Oral Health
April 21-23, 2014 Crown Plaza Dubai, UAE

The effect of radiotherapy dose on the bond strength of resin composite to both enamel and dentin

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Purpose: To investigate the influence of different gamma irradiation doses on the bond strength to enamel and dentine using two different bonding systems.

Materials & Methods: flat enamel and dentin surfaces on human premolars were obtained and cylindrical-shaped specimens for the microshear bond strength were built up with Two types of commercially available adhesive systems which have been used in the study along with two resin composites: Filtek 250 XT nanohybrid with Etch and rinse adhesive system (Adper Scotch Bond Multi-Purpose) and Filtek LS Low Shrink Posterior composite with LS System Adhesive Self-Etch Primer & Bond. The specimens were assigned to 2 groups (n=20), according to the x-ray dose: 35 or 70 Grays (Gy). Radiation was directed to the surface of the resin cylinders. Microshear testing was conducted within one week for bond strength. Data were submitted to three way-ANOVA and Tukay post-hoc test were used when the ANOVA was significant. Independent t-test was used to study the effect of radiation dosage for each group.

Results: Bond strength results were dose, material and substrate dependent. 70 GY irradiation dosages produced a significant reduction on micro-shear bond strength compared to 35 GY. Moreover, total etch adhesive system SB produced significant higher values for Micro-Shear bond strength compared to Self-etch LS. Also Enamel produced the highest mean micro-shear bond strength compared to dentine.

Conclusion: Irradiation presents a dose-dependent detrimental effect on the bond strength of resin composite to both enamel and dentin.

Biography

Eman Arnout is Oral & Maxillofacial Radiologist assistant professor at Taibah University, Madinah, KSA / Ain- Shams University Cairo, Egypt. She was finished her PhD in University of Minnesota, USA which was a joint supervision grant offered by Ain- Shams University. She is the Director of Oral and Maxillofacial Radiology clinic at Taibah University. Dr. Arnout research interest include evaluation of osteoporosis, Conception of norms TMJ radiographic classification from cone beam computed tomography of adult and children & Biological hazard of X-ray. She has several published article in National and International Journals.

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