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EFFECT OF DIFFERENT GAMMA RADIATION DOSES ON THE MECHANICAL PROPERTIES OF ESTHETIC RESTORATIONS

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This *in-vitro* study investigated effect of different gamma radiation doses on the mechanical properties of esthetic restorations. A total of 84 standardized specimens were prepared for this study. Each 21 of them were prepared using the following four resin composites: Ceram X (Dentsply), Z350 xt (3M ESPE), Xtra fill (Voco) and Grandio (Voco). Then, the 21 specimens were divided as follows: 3 specimens representing the control group (C) were cured using wood pecker LED light cure unit, 9 specimens were subjected to gamma radiation after curing (IaC) from which three were subjected with a dose of 10 Gy (IaC-10), the other three with 30Gy (IaC-30) and the last three with 60 Gy (IaC-60); the last 9 specimens were subjected to gamma radiation before curing (IbC) from which three were subjected with a dose of 10 Gy (IbC-10), the other three with 30 Gy (IbC-30) and the last three with 60 Gy (IbC-60). All specimens were subjected to measurement of surface microhardness in Vickers hardness tester. The depth of cure was calculated by obtaining the microhardness ratio through dividing Vickers hardness number (VHN) of the bottom surface by VHN of the top surface. Data was then recorded, tabulated and statistically analyzed. Most results of the specimens' top showed statistically significant increase in mean microhardness of IaC and IbC sub-groups in relevance to the control groups. Most results of the specimens' top showed statistically significant increase in mean microhardness of IbC sub-group in relevance to IaC sub-group. Results of (B/T) showed increase in mean depth of cure of IbC sub-groups in relevance to the control group and to IaC sub-groups, where most of them are statistically significant. Pearson correlation coefficient between top and bottom was found to be statistically significant (r=0.9). In conclusion, surface micro hardness of different composite resin have improved following being subjected to gamma radiation by various doses, on the other hand most of the results of the depth of cure was low for the group IaC and has improved for the group IbC.

Biography

Dr Ahmed is holding doctorate degree from Cairo University, Egypt. He is now holding the position of Assistant professor in the Restorative Dentistry department at the Egyptian Russian University in Egypt.

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