Nazli Yesilyurt Aydin et al., J Oral Hyg Health 2017, 5:1 (Suppl)
http://dx.doi.org/10.4172/2332-0702-C1-005

Comparison of the internal and marginal adaptation of metal substructures fabricated by different manufacturing techniques

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Using computer aided methods, a final object can be manufactured either by milling from a block or additive manufacturing which allows standard object production with low cost and decreased manufacturing time. The aim of the study was to compare the internal and marginal fit of crowns fabricated using conventional casting, laser sintering and soft-metal milling. A first maxillary molar die made of metal was fabricated. Metal substructures with standardized sizes were manufactured using conventional casting, laser sintering and soft-metal milling (N=15/group). Internal-fit and marginal-fit of metal substructures were evaluated. The metal substructures were seated on the metal die using light body silicone material. Excess silicone was cleaned. Following the setting, crowns were removed and silicone was weighed to evaluate the 3D internal cement gap. Same specimens were used for marginal gap measurements under a light microscope. Statistical analysis was performed using one-way ANOVA followed by Tukey HSD test (α=.05). A statistically significant difference was observed for both internal and marginal fit among compared groups ($p<0.05$). The highest mean silicone weight (standard error) was observed in casting group (36.8±1.9 mg) followed by laser sintering (26.6±1.5 mg) and soft-metal milling (20.7±1.4 mg) groups. The lowest mean marginal gap (standard error) was observed in laser sintering group (4.2±1.2 µm) followed by casting (8.7±1.2 µm) and soft-metal milling (22.3±1.2 µm) groups. Although statistically significant differences were observed among all compared groups, a clinically significant difference can't be mentioned.

Biography

Nazli Yesilyurt Aydin has completed her license in 2013 from Marmara University, College of Dentistry. She is currently enrolled in a Specialty Program in Department of Prosthetic Dentistry at Cukurova University.

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