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The effect of different finish lines on marginal and internal fit of a ceramic crown fabricated by CAD/CAM system

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This study evaluates the marginal discrepancy of CAD/CAM ceramic coping of two different finish line preparations. Two master steel dies were prepared, one with rounded shoulder (RS), and the other with chamfer (C). CEREC 3D Sirona CAD/CAM system and Software Version 2.80 R2400 were used in this study. The optical camera was fixed in a distance of 10 cm and 90 degree to take the same optical capture for each sample. CEREC cylinder pointed bur was used to cut the Ivoclar Vivadent ProCAD Milling Blocks to fit on the dies. Twenty copings were prepared, ten CAD/CAM ceramic coping from each finish line preparation. Each coping with its corresponding die was sectioned longitudinally using ISOMET 2000 PRECISION SAW. The marginal discrepancy was then evaluated in Travelling Microscope. The data of marginal discrepancy in micrometer (μ) were subjected to two way analysis of variance using SPSS version 15. The mean value of marginal discrepancy was 135.48 μm and 85.7 μm for chamfer group (C) and rounded shoulder group (R) respectively. Furthermore, there was a significant difference in the axial fitting on the occlusal side (occlusal adaptation) of the crowns between the chamfer and shoulder groups ($p<0.05$). Shoulder group showed the lowest mean value of 95.84 μ ± 15.02, while chamfer recorded the highest value of 137 μ ±13.09. The results showed that there was a significant difference between the two groups. It was concluded that marginal fit of CAD/CAM all-ceramic crowns with rounded shoulder finish line had better adaptation than chamfer finish line. The adaptation of CAD/CAM crowns obtained with chamfer finish line was not clinically accepted.

Biography

Alaa Elaraby has completed his Bachelor of Dental Surgery from Alexandria University, Faculty of Dentistry, PhD from Nagasaki University, and Postdoctoral studies from Nagasaki University, School of Dentistry. He created the phase diagram of Gold–Copper Pseudo-binary system at Nagasaki University, Japan. He established and created the curriculum of the Doctorate program in Dental Materials at College of Dentistry, King Saud University. He was the Director of Dental Biomaterials courses for undergraduate and postgraduate students at University of Alexandria and King Saud University. He has published more than 30 papers in local and international peer reviewed dental journals and has been serving as an Editorial Board Member of the *Saudi Dental Journal* (Section Editor in Restorative Dentistry).

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