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20-Year Results of Cast Gold and CAD/CAM Partial Ceramic Crowns

K. J. Scholz^{1,2}, J. L. Pfister², K. Hiller², I. M. Schenke², G. Schmalz^{2,3}, W. Buchalla², M. Federlin², F. Cieplik^{1,2}

¹Department of Operative Dentistry and Periodontology, Faculty of Medicine, University of Freiburg, Freiburg, Baden-Württemberg, Germany, ²Department of Conservative Dentistry and Periodontology, University Hospital Regensburg, Regensburg, Bavaria, Germany, ³Department of Periodontology, School of Dental Medicine, University of Bern, Bern, Switzerland, Bern, Switzerland

Objectives To investigate the long-term clinical performance of cast gold partial crowns (CGPCs) compared to CAD/CAM partial ceramic crowns (PCCs) after up to 20 years.

The null-hypothesis was that CGPCs and PCCs reveal similar survival and performance.

Methods In this controlled, prospective, clinical split-mouth study, initially, 29 patients received one CGPC (Degulor-C) and one PCC (Vita Mark II/Cerec3). The follow-up examination after 20 years was performed by two independent investigators using both, modified USPHS- and FDI-criteria. Kaplan-Meier survival rates were calculated. Non-parametrical statistical procedures (χ^2 , log-rank (Mantel-Cox), $\alpha=0.05$) were applied.

Results Out of the initially 29 patients, 11 patients with 19 restorations could be recruited for a recall after a median (25-75%) observation period of 238 (236; 242) months (19.9 years). Within these 11 patients, 10 CGPC and 9 PCCs were still in service. Kaplan-Meier analysis showed cumulative survival of 73.3 % for CGPC and of 55.6 % for PCC, without statistically significant differences. All available restorations showed ratings within the acceptable range in all criteria (USPHS: Alpha or Bravo except for secondary caries, FDI-ratings 1-3). For USPHS-criteria surface lustre ($p \leq 0.002$) and marginal discoloration ($p \leq 0.02$), both, CGPCs and PCCs, revealed a significant deterioration over time. Additionally, marginal adaptation of PCCs deteriorated over time ($p < 0.001$), whereas CGPCs revealed significantly better results ($p = 0.003$). In FDI criteria, CGPCs performed significantly better in criteria surface staining (A2a; $p = 0.047$) and marginal adaptation (B6; $p = 0.01$) compared to PCCs.

Conclusions All posterior gold and ceramic partial crowns available for evaluation showed acceptable results after up to 20 years, with slight advantages for gold partial crowns in singular criteria. The findings of the present study suggest that gold cast partial crowns and CAD/CAM ceramic partial crowns can both be confidently recommended for long-term clinical application.