AIOP Poster Awards

The following are the three best scientific posters that were presented at the 32nd International Congress of the Italian Academy of Prosthetic Dentistry held in Bologna on November 21–23, 2013.

First Prize

Repeatability of Digital Versus Conventional Impressions

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Objective: The purpose of this study was to compare the precision of traditional and digital approaches by evaluating the repeatability of the two impression methods. ***Methods:*** A metal cast of a molar and premolar with inlay preparations was used as a master model. Fifteen digital datasets were generated with Cadent iTero, Lava COS, and MHT intraoral scanners and digitalized using Dental Wings laboratory scanner (control group). The gypsum casts were obtained by pouring 15 monophase polyether impressions. The standard triangulation language (stl) files were cropped with Geomagic Studio 12 software to obtain three groups: the complete cast of the two inlay preparations (group 1), the impression of the single molar (group 2), and the impression of the single premolar (group 3). The files of the same group were superimposed over one another using a "best fit" algorithm. At the end of the process, 105 superimpositions were obtained for each group. A deviation analysis test (Geomagic Studio 12) was performed, and the discrepancies of each superimposition were calculated. The statistical analysis was done with the student ***t*** test at a .001 significance level (JMP 9.0) to evaluate the differences between the digitalization techniques. ***Results:*** No statistical differences were found in group 1 between conventional and digital impression techniques. Based on the results of groups 2 and 3, the Lava COS and iTero impressions instead showed significantly lower discrepancies than the indirect digitalization method. ***Conclusion:*** Within the limitations of this study, it appears that the repeatability of direct data captured with intraoral scanners and, in particular, with Cadent iTero and Lava COS, could be slightly better than using a conventional impression technique followed by indirect digitalization.

Second Prize

Comparative Analysis of Three Zirconia Systems and Metal-Ceramic for Posterior Fixed Dental Prostheses: A 5-Year Prospective Study

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Objective: The aim of this prospective study was to evaluate and compare the clinical behavior and the survival rate over 5 years of posterior three-unit fixed denta; prostheses (FDPs) made of metal-ceramic and three zirconia systems. The null hypothesis was that there would be no differences among the materials. ***Methods:*** Sixty-nine patients in need of 80 FDPs replacing one posterior tooth (molar or premolar) were included in the study. The FDPs were randomly assigned to 20 for each zirconia system and 20 for metal-ceramic restorations. All abutment teeth were prepared as follows: occlusal reduction of 1.5 to 2 mm and an axial reduction of 1 mm with 10- to 12-degree taper, and 1-mm-wide circumferential chamfer. Impressions were taken using addition silicone (Express, 3M ESPE). The zirconia frameworks were made using three computer-aided design/computer-assisted manufacturer systems (NobelProcera Zirconia, Nobel Biocare; Lava, 3M ESPE; IPS emax ZirCAD, Ivoclar Vivadent). The metal-ceramic restorations were fabricated from a chromium-cobalt alloy (Heraenium Pw, Heraeus Kulzer) using the traditional lost wax technique. The zirconia FDPs were cemented using a resin-based cement (RelyX Unicem, 3M ESPE) and the metal-ceramic FDPs were cemented using a glass-ionomer cement (Ketac Cem, 3M ESPE). Each patient was reviewed at 1 week and at 1, 3, and 5 years following placement. Restorations were assessed using the California Dental Association (CDA) criteria.

Periodontal parameters were also evaluated. Statistical analysis was performed using Wilcoxon rank sum test. ***Results:*** The survival rate was 85% for the Procera group, 95% for the Lava group, and 100% for the emax ZirCAD and metal-ceramic restorations after 5 years. No fracture of a zirconia or metal framework was observed. Two zirconia restorations in the Procera group and one in the Lava group failed for biologic reasons. Chipping of the veneer was observed in eight restorations in the Procera group (one resulted in the need to replace the FDP), three in the Lava group, and four in the emax ZirCAD group. The CDA rating of satisfactory was given for 100% of the remaining restorations at a 5-year evaluation. Significant differences among the groups were found for surface and color, being the difference between the Procera and metal-ceramic groups. No differences in periodontal parameters were observed among the groups except for Margin Index. There was significant change from baseline to the 5-year follow-up for color and surface and margin integrity. ***Conclusion:*** After an observational period of 5 years, the survival rate for zirconia posterior FDPs was inferior to metal-ceramic FDPs except for emax ZirCAD FDPs. Higher rates of technical complications were found at zirconia FDPs compared with metal-ceramic FDPs, mainly caused by chipping of the veneering ceramic.

Third Prize

Efficacy of a Checklist for Office–Laboratory Communication: A Clinical Study on Quality Outcome of Single Crowns

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Objective: Clear and effective communication between the clinical office and dental laboratory is a prerequisite for the production of high quality fixed and removable prostheses. Studies published in the literature have demonstrated that communication of design information for fixed prosthodontics is poor. A Surgical Safety Checklist, modeled on the experience of the aviation industry, has been introduced by the World Health Organization to reduce the number of errors during surgical operations. The aim of this study was to evaluate the efficacy of structured communication between clinician and dental technician by evaluating the quality outcomes of crowns before and after the introduction of a checklist. ***Methods:*** Four pairs of clinicians and dental technicians were asked to check the outcome of all single posterior metal-ceramic crowns produced in their offices between July 1, 2011, and February 28, 2012. A total of 112 metal-ceramic crowns were evaluated at the try-in clinical appointment by scoring the clinical acceptability of the following parameters: contact area, precision of fit, occlusion, tooth morphology, and shade. From April 1, 2012, to December 31, 2012, each pair of clinician/dental technician was asked to produce another set of 112 crowns, but this time following a structured communication protocol by means of a checklist. The new crowns were checked at the try-in appointment with the same criteria previously described. ***Results:*** The scores before and after the use of the checklist were compared using the Mann–Whitney test (significant two-tailed P value $< .05$). The statistical analysis showed that median scores of contact area, precision of fit, and occlusion differed significantly before and after the use of the checklist. However, median scores of tooth morphology and shades did not significantly differ. ***Conclusion:*** Within the limits of this study, the introduction of a checklist improved the communication between clinicians and dental technicians, resulting in an increased quality of metal-ceramic crowns produced by the dental laboratories.