AIOP Poster Awards

The following are the three best scientific posters that were presented at the 30th International Congress of the Italian Academy of Prosthetic Dentistry held in Bologna on November 17–19, 2011.

First Prize

Four-Year Prospective Clinical Evaluation of Zirconia and Metal-Ceramic Posterior Fixed Dental Prostheses

Jesús Peláez*, Pablo Gómez*, Benjamin Serrano*, MariPaz Salido*, Maria Jesús Suárez*

*University Complutense of Madrid, Madrid, Spain.

Objectives: The aim of the present study was to compare the survival rates and biologic and technical complications of three-unit metal-ceramic posterior fixed dental prostheses (FDPs) with those obtained when using the Lava system. The null hypothesis was that no differences would be found between the parameters studied for each type of restoration. ***Methods:*** Thirty-seven patients in need of 40 three-unit posterior FDPs were included in the study. The FDPs were randomly assigned to 20 zirconia and 20 metal-ceramic restorations. Abutment preparation was performed as follows: a circumferential chamfer (1 mm in width), an axial reduction of 1 mm, and an occlusal reduction of 1.5 to 2.0 mm. The tapering angle was 10 to 12 degrees. After preparation, full-arch impressions were taken using addition silicone (Express Penta Putty and Express Penta Ultra-Light Body, 3M ESPE) and the double-impression technique. Provisional restorations (Protemp Garant, 3M ESPE) were then made and cemented using a temporary eugenol-free zinc oxide cement (Integrity Temp-Grip, Dentsply De Trey). The ceramic restorations were prepared using the Lava (3M ESPE) CAD/CAM system, and the metal-ceramic restorations were fabricated from a cobalt-chromium alloy (Heraenium Pw, Heraeus Kulzer) using the conventional casting technique. The ceramic FDPs were cemented using a resin-based cement (Rely X Unicem, 3M ESPE) and the metal-ceramic ones with a glass-ionomer cement (Ketac Cem, 3M ESPE). At baseline and 1, 2, 3, and 4 years after cementation, success of both types of restorations was evaluated. The restorations were assessed using the California Dental Association's assessment system. Periodontal parameters were assessed by determining the Plaque Index, Gingival Index, Margin Index, and pocket depth of the abutment and control teeth. Statistical analysis was performed by applying the Wilcoxon rank sum and Wilcoxon signed rank tests. ***Results:*** The survival for metal-ceramic restorations was 100%; survival was 95% for zirconia restorations. One biologic complication in a zirconia FDP was observed at the 3-year follow-up. No fractures of the zirconia or metal frameworks were observed. Restorations from both groups were assessed as satisfactory. Minor chipping of the veneering ceramic was observed in 2 (11%) zirconia FDPs. No significant differences were observed between the abutment and contralateral teeth for either type of restoration as well as within the groups with regard PI, GI, and pocket depth. ***Conclusions:*** Zirconia-based FDPs demonstrated a similar success rate to metal-ceramic FDPs after medium-term clinical use.

Second Prize

Phase Transformation of Zirconia Dental Ceramic: A Micro-Raman Spectroscopic Analysis

Chiara Ottavia Navarra*, Roberto Sorrentino**, Gianluca Turco*, Roberto Di Lenarda*, Milena Cadenaro*, Lorenzo Breschi*

*Università degli Studi di Trieste, Trieste, Italy.
**Università degli Studi di Napoli Federico II, Naples, Italy.

Objectives: Zirconia is a metastable material that is transformed and stabilized in the tetragonal (t) polymorph phase from a monoclinic (m) phase during crown preparation. The re-transformation from t to m phases can be induced by the application of external tensions, increasing the fracture toughness of the material remarkably. This t–m phase transformation of zirconia crystals under load is known as "transformation toughening." The present study aimed to evaluate if different marginal preparations of zirconia crowns (ie, deep

chamfer, slight chamfer, feather-edge) produce a premature phase trasformation of zirconia immediately after the preparation and after chewing simulation using micro-Raman spectroscopy. ***Methods:*** Fifteen zirconia copings were prepared with a deep chamfer, slight chamfer, or feather-edge finish line (n = 5 per group) and placed in a chewing simulator (CS-4.4, SD Mechatronik) under a cyclic occlusal load of 50 N for a total of 172,800 cycles to simulate 1 year of clinical service. Twenty spectra for each specimen were acquired with a modular spectrograph (wavelength: 785 nm; Renishaw InVia, Renishaw) along the cervical margin and 5 at the top of each coping, ie, where the load was distributed and applied before and after chewing, respectively. When phase transition of the zirconia occurs, the typical bands of monoclinic zirconia (181 cm-1, 192 cm-1) appear near the peaks attributed to tetragonal zirconia (148 cm-1, 264 cm-1). Acquired data were then analyzed with spectrographic analysis software (Grams/AI 7.02, Thermo Galactic Industries). ***Results:*** The spectral region between 100 and 300 cm-1, which contains all the vibrational bands necessary to provide reliable information on the extent of the t–m transformation, did not show the typical monoclinic bands at 181 and 192 cm-1. No changes were detected in any of the tested groups. ***Conclusions:*** After 1 year of simulated chewing activity, zirconia crowns did not show any signs of t–m transformation neither where the load was applied nor at the margins. Further studies are needed to investigate if a longer chewing time can produce negative effects on zirconia.

Third Prize

Impact of Prosthodontic Treatment on Quality of Life. A Prospective Cohort Study

Javier Montero*, Joaquín Lopez-Marcos*, Alberto Albaladejo*, Raquel Castillo DeOyague**, Antonio Lopez-Valverde*, Galindo MªPurificacion***, Vicente MªPurificacion***

***Department of Surgery, University of Salamanca, Salamanca, Spain.*
***Department of Prosthodontics, University Complutense, Madrid, Spain.*
****Department of Statistics, University of Salamanca, Salamanca, Spain.*

Objectives: To assess the impact of prosthetic treatment on the oral health–related quality of life of dental patients attending the university clinic in Salamanca, Spain. ***Methods:*** The authors performed a prospective cohort study at the university clinic in Salamanca in which a consecutive sample of dental patients was examined clinically at baseline and later classified according to the type of dental treatment received. Baseline oral well-being was captured using the OHIP-14sp (Oral Health Impact Profile 14-Spanish version). One month after treatment, oral well-being was reassessed using the POST-OHIP questionnaire, in which patients answered whether the treatment received had generated a poorer, equal, or better effect on the 14 items of this retrospective instrument. The global score of the POST-OHIP test was obtained by summing the responses registered from the 14 items, in which the three response options were coded as better = +1, the same = 0, and worse = –1. Thus, a global POST-OHIP score of > 0 would imply a net therapeutic benefit. ***Results:*** The sample comprised 255 dental patients (51.8% female) with a mean age of 63.1 ± 12.7 years distributed among the prophylactic (15.7%), restorative (11.8%), perio-surgery (7.5%), prosthetic (24.3%), and comprehensive (40.8%) treatment cohorts. The baseline scores of the OHIP-14 were not significantly different among cohorts, but the POST-OHIP scores were significantly better among the perio-surgery (3.5 ± 3.9), prosthetic (3.7 ± 2.9), and comprehensive cohorts (4.7 ± 3.1). On average, the patients followed (n = 227) perceived a global benefit after treatment (POST-OHIP mean score: 2.7 ± 4.0). The risk ratio for perceiving a global benefit effect was more than 3 times higher for patients receiving prostheses (1.7; 95% confidence interval [CI]: 1.3 to 2.2) than their counterparts (0.5; 95% CI: 0.3 to 0.7) and more than twofold higher for those receiving dental extractions (1.6; 95% CI: 1.1 to 2.2) than their counterparts (0.8; 95% CI: 0.6 to 0.9) and those receiving dental fillings (1.4; 95% CI: 1.1 to 1.8) than their counterparts (0.6; 95% CI: 0.4 to 0.8). Within the prosthetic cohort, patients receiving skeletal dentures or complete dentures perceived a significantly better improvement after treatment than their counterparts. ***Conclusions:*** In general, after dental treatment, all patients perceived a global benefit, this benefit being greater among the perio-surgery, prosthetic, and comprehensive treatment cohorts.