AIOP Poster Awards

The following were selected as the three best scientific posters presented at the 33rd International Congress of the Italian Academy of Prosthodontic Dentistry held on November 20–22, 2014.

First Prize

Correlation Between the Occurrence of Mandibular Lateral Translation in Symmetric Mandibular Movements and Different Skeletal Classes: A Cephalometric and Condylographic Study

Alessandro Carmignani,[a] Roberto Carmignani,[a] Markus Greven[b]

[a]*Private Practice, Pontedera, Italy.*
[b]*Vienna School of Interdisciplinary Dentistry and Medical University of Vienna, Vienna, Austria; Department of Craniofacial Growth and Development Dentistry, Division of Orthodontics, Kanagawa Dental College, Yokosuka, Japan.*

Objectives: The aim of this investigation was to determine whether there is a correlation between the dynamics of mandibular lateral translation during symmetric movements (ΔY MLT) in patients exhibiting different skeletal classes. The main goal was to evaluate the relationship between the occurrence of maximum ΔY in protrusive/retrusive (P/R) or open/close (O/C) movements at different levels of severity and the selected subjects' skeletal classes. The second goal was to compare the maximum ΔY values, measured in P/R and O/C movements, in the context of four selected cutoffs (0.65, 0.70, 0.75, and 0.80 mm). ***Methods:*** A convenience sample of 108 patients (46 men, 62 women, mean age: 44.1 years old) from a private dental practice were examined by means of a three-dimensional (3D) computerized condylography protocol to detect the occurrence of a ΔY MLT during prescribed symmetric movements. Each patient underwent an analysis of bilateral condylographic tracings (216 TMJ): two for P/R and two for O/C movements. The maximum ΔY MLT value occurring on one side was used as the measurement of the Y axis distance to the maximum point of translation in both tracings. A lateral cephalometric tracing was carried out and evaluated, ad modum Slavicek, in order to define individual sagittal intermaxillary skeletal relationships for each patient.

A paired Student *t* test was used to evaluate the difference between the two repeated measurements of ΔY MLT in P/R and in O/C movements. Two different multinomial logistic regression models were performed to estimate the association between the skeletal classes patients belonged to and the severity levels of the lateral translation; statistical models also included age and sex as independent variables. Moreover, to test the correlation among the risk of presenting a pathological level of ΔY MLT both in P/R movements and in O/C movements, a chi-square test was performed for each skeletal class using four cutoffs (0.65, 0.70, 0.75, 0.80 mm). ***Results:*** The repeated measurements carried out for each patient were highly correlated and confirmed the accuracy of the clinical instrument analysis (electronically assisted condylography), independent from the patient skeletal pattern relationship. Patients belonging to different skeletal classes did not show statistical differences in terms of ΔY MLT average value in P/R or in O/C movements. However, the multivariate analysis indicated that the skeletal class II patients showed a higher risk of a pathological ΔY MLT in O/C movements when compared to the skeletal class I patients. During P/R movements, a higher level of risk in patients belonging to the skeletal class I was evident. Moreover, the skeletal class I patients showed a high level of probability to present a pathological level in both types of symmetric mandibular movements at any one of the selected cutoff figures, whereas skeletal class II patients appear to have a major probability to present this complex pathological profile only in the case of highest lateral translation (more than 0.8 mm). ***Conclusions:*** Chi-square tests showed that the occurrence of ΔY MLT both in P/R and in O/C is associated within the skeletal class I at any level of the selected cutoff figures. On the contrary, patients belonging to the skeletal class II have a probability of presenting a pathological level of ΔY MLT in both types of mandibular movements only if the cutoff is 0.8 mm (the largest width of lateral translation). A wider sample of subjects belonging to the skeletal class III is necessary to better determine the statistical power and clinical merits of the observations.

Second Prize

SEM Analysis of Marginal Precision Between Digital and Classical Impressions in Single Crowns

M. De Francesco, A. Di Fiore, A. Mastrorosa Agnini, L.P. Sandri, M. D'Amelio, E. Stellini

University of Padova, Department of Neurosciences

Objectives: Fifty years have passed since publication of the first article describing the application of digital techniques. Nowadays, the development of software and hardware allows for comparable, if not better, results than traditional techniques. The digital print, in particular, could be considered a method to improve the accuracy and sharpness of prosthetic restorations via the standardization of the production process. With traditional techniques, the latter presents the physiologic introduction of errors linked to the limitations of the materials used. The aim of this study was to evaluate the marginal accuracy of single crowns made with traditional prints and with the aid of an intraoral scanner based on a confocal microscope. ***Methods:*** Thirty patients' teeth were selected to be restored with a single crown for maxillary premolar. Once the tooth was prepared, the prints were recorded with the classical mono-phase technique and with the intraoral scanner (Zfx IntraScan, Zimmer). After that, two metal copings were obtained from each tooth, then rebased with silicone; via a position impression, it was possible to make a cast where the copings were later cemented with Fuji cement. Once cut in a vestibularlingual direction, they were examined with SEM, taking two records for each stump. ***Results:*** A statistical analysis of the results showed a mean of 79.23 for the classical impression techniques and a mean of 54.73 for the digital impression, with a standard deviation relatively lower for the digital impression values. ***Conclusions:*** Researchers were able to affirm, according to the literature, that digital impression techniques enhance the marginal precision and, more importantly, standardize the final results. This reinforces the argument that the digital stream is a process that is capable of reducing errors within the limitations of the materials used in traditional techniques.

Third Prize

Minimally Invasive CAD/CAM Hybrid-Ceramic Restorations: Preliminary Clinical Results

Alexander Vuck, Jörg Rudolf Strub, Petra Guess

Department of Prosthetic Dentistry at the Medical Center–University of Freiburg, Freiburg, Germany.

Objectives: Preliminary observations of a 5-year prospective clinical investigation on survival rate and long-term behavior of CAD/CAM hybrid-ceramic minimally invasive restorations on premolars and molars. The clinical procedures and results of the present study are presented by means of an extensive representative clinical example. ***Methods:*** A total of 103 posterior teeth of 33 patients were restored with hybrid-ceramic (VITA ENAMIC, Vita Zahnfabrik) minimally invasive restorations (45 inlays and 58 full veneers/onlays). All hybrid-ceramic restorations were fabricated with the Sirona CAD/CAM system (Cerec AC Bluecam/InLab, Sirona). Minimally invasive defect-oriented preparation designs were applied. All restorations were adhesively luted with a dual-polymerizing composite (Syntac/Variolink II, Ivoclar Vivadent). Clinical reevaluations were performed at baseline and 6 and 12 months after insertion of the restorations according to modified USPHS criteria. Absolute failures were demonstrated by Kaplan-Meier survival rates. ***Results:*** After an observation period of 1 year, survival rate of the hybrid-ceramic inlays, full veneers, and onlays was 100%. Secondary caries did not occur. Marginal adaptation and marginal discoloration of all restorations were clinically satisfying. Color match and the anatomical form were predominantly rated as Alpha for both restoration forms for the given observation period. All hybrid-ceramic restorations demonstrated a significant increase of Bravo ratings in the criteria surface roughness ($P < .001$) after 12 months. ***Conclusions:*** Within the timeframe limitation of the present clinical study report, the tested CAD/CAM hybrid-ceramic material revealed promising results for inlays, onlays, and posterior full veneers. Due to the high edge stability of the hybrid-ceramic, its use is particularly indicated for minimally invasive restorations with thin restoration margins. Clinical long-term data are needed to confirm the present results.