



Analysis of the accuracy of the optical impression made using a new intraoral scanner.

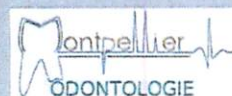


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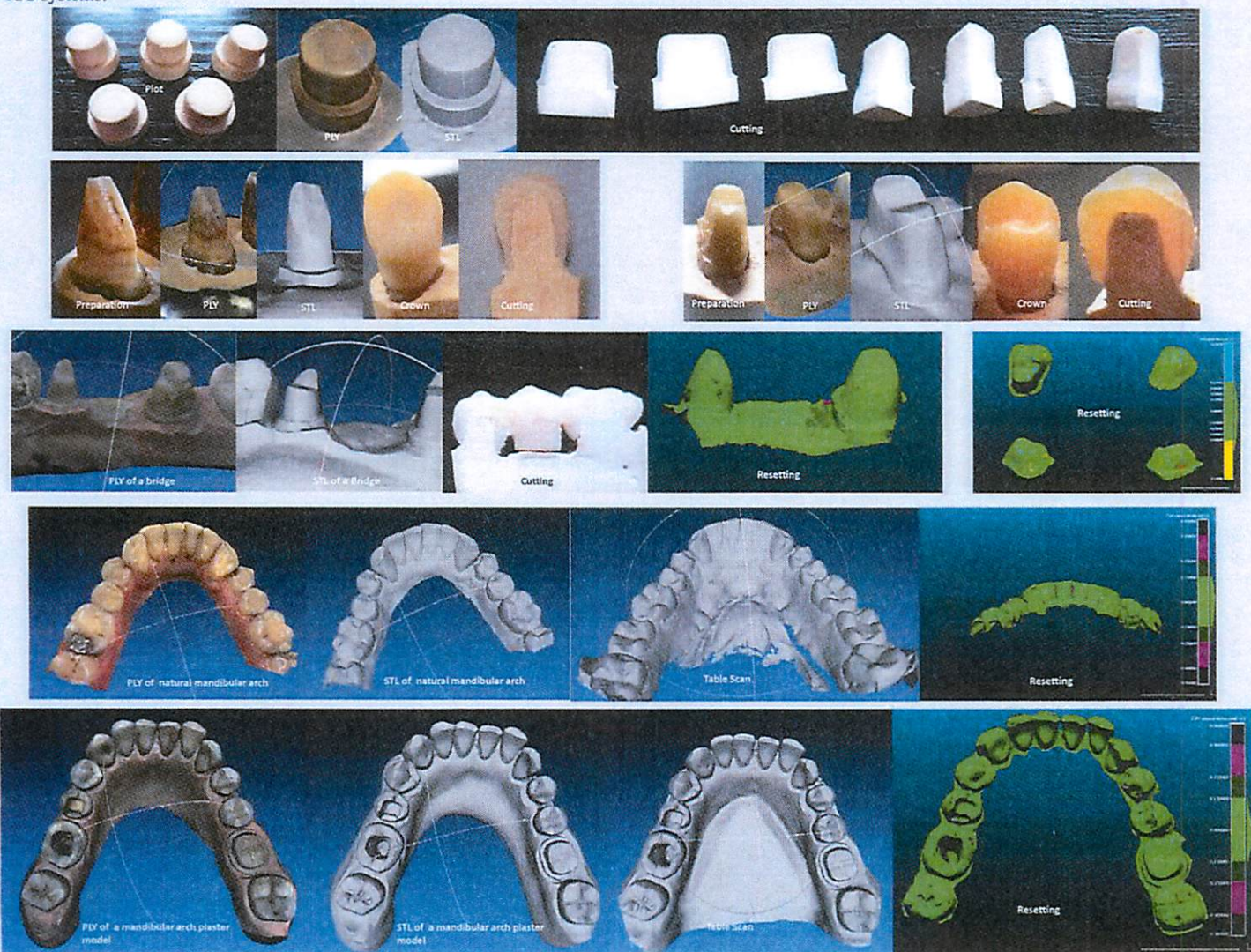


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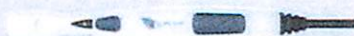
Goal: a new intraoral dental scanner (IOS) entirely software dependent arrived on the market. The objective of this study is to evaluate the accuracy of the Condor intraoral scanner, locally (on a preparation) and regionally (a complete arcade) and compare it to other scanners already in use (Planscan, Itero and Carestream 3500).

Material and method: models of 5 identical reference pieces (e.g. flattened cone with chamfer), 5 dental preparations and 5 dental arches are made in plaster and scanned, using a tabletop scanner (Imetric 102, CH), in order to obtain 15 reference STL files (3 x 5) with a precision of less than 10 μ m. These same 15 models are scanned 3 times using a dental stereoscopic IOS Condor (SAS Condor France) by 3 different operators. They allow to get 45 x 3 is 135 STL/PLY files (3 models by 3 operators). This manual scanning must be done within a reasonable timeframe, i.e. not to exceed one and a half minutes on the dental preparation or reference piece and two and a half minutes for a complete arch. Each of the 135 PLY/STL files obtained using the Condor camera are compared with 15 reference STL files using the CloudCompare V2 software. Precision histograms are generated based on comparisons with scans from other IOS systems.

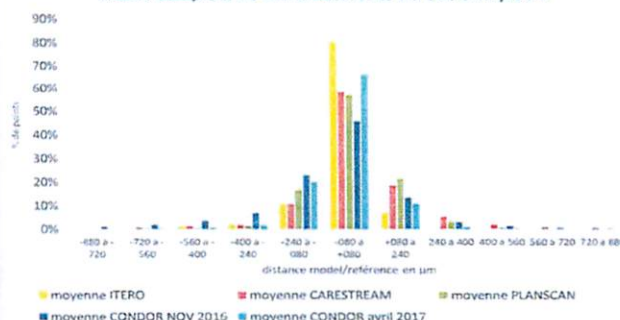


Results: Comparisons show an accuracy between 20 and 50 μ m between the reference pieces and the dental preparations (on more than 80% of the points) and an accuracy between 20 and 150 μ m on the dental arch (on more than 75% of the points). These measurements do not include the inherent tabletop scanner error

Conclusion: The new intraoral scanner Condor, entirely software dependent, uses a stereoscopic method with a fixed focal. It's the accuracy equals of three reference scanner's present on the market.



arcade complète de dents naturelles sur socle en plâtre



The aim of this in vitro study was to evaluate the marginal seal of a nanohybrid bulk-fill composite compared to a nanohybrid non-bulk composite, using a universal adhesive applied in self-etch and total-etch mode.

12 non-carious molar were selected and two 4x4x4 mm cavities, buccally and palatally/lingually, were prepared. The samples were divided into four groups: in group 1 and group 2 the composite bulk-fill nanohybrid Admira Fusion x-tra (VOCO) was used, added in a single mass of 4 mm and cured for 1 minute; in group 3 and group 4 nanohybrid composite Admira Fusion (VOCO) was used, added in two increments of 2 mm each and cured for 40 seconds. The universal adhesive Futurabond U was used for all samples: in group 1 and 3 in the self-etch mode; in group 2 and 4 in the total-etch mode. All samples were immersed in a 10% methylene blue solution for 48 hours, occlusal surfaces were subjected to an abrasion process with a smoothing machine and subsequently analysed with a stereo microscope under 12x magnification to measure the possible penetration of the dye.

The best result was achieved by the group 2, in which there is no infiltration in 70.8% of cases, followed by the group 4 (66.7%), by group 1 (54.2%) and finally by the group 3 (41.7%). The average of marginal infiltration was 0.08 mm for group 4, 0.1 mm for group 2, 0.24 mm for group 1 and 0.31 mm for group 3.

The investigated materials showed a comparable marginal leakage. The universal adhesive Futurabond U used in total-etch mode, both for the bulk-fill composite and the nanohybrid control composite, scored the best results in terms of rate and extent in the depth of infiltration compared to the self-etch mode.

Operative Dentistry

Poster P.113

A NOVEL TECHNIQUE FOR TWO STEP DENTAL IMPRESSIONS.

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An accurate impression is a prerequisite for manufacturing well-fitting indirect restorations. Among the broad range of impression techniques and materials, the use of stock trays combined with vinyl polysiloxane (VPS) materials is very popular, as it is accurate and simple. The impression can be conducted in a one- or two-step procedure, with the latter having the advantage of no need for auxiliary personnel. The major drawback of the classic two-step technique is the increased intraoral setting time of the impression materials, and the need for relief for space making for the low viscosity material. The objective of this poster was to describe a novel technique for taking two-step putty-wash dental impressions with reduced intraoral time and no need for material relief after the first impression and still with no need of an assistant.

A gypsum cast of the wax-up/provisional restoration/initial situation before teeth preparations is needed. First, the putty material is hand mixed, placed at the stock tray, covered with a PVC film, seated on the gypsum cast and wiggled around for space making. After setting of the putty, the impression is taken off from the cast and the PVC film is removed. The light body material is placed onto the prepared teeth and over the putty material and then the tray is seated. After setting of the light material, the impression is removed from the oral cavity.

This modified two-step impression technique with an extraoral and intraoral component, offers reduced chairside time compared with the classic alternatives of two-step impression techniques.

Furthermore, the relief space is already formed using a cast, the PVC film and a wiggling motion. Therefore, there is no need for space relief with bur or scalpel after the setting of the first step with the putty material.

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Poster P.114

ACCURACY ANALYSIS OF THE OPTICAL IMPRESSION MADE USING A NEW INTRAORAL SCANNER

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A new intraoral dental scanner (IOS) entirely software dependent arrived on the market. The objective of this study is to evaluate the accuracy of the Condor intraoral scanner, locally (on a preparation) and regionally (a complete arcade) and compare it to other scanners already in use (Cerec Omnicam, Itero and Carestream 3500).

Models of 5 identical reference pieces (e.g. flattened cone with chamfer), 5 dental preparations and 5 dental arches are made in plaster and scanned, using a tabletop scanner (Imetric 102, CH), in order to obtain 15 reference STL files (3 x 5) with a precision of less than 10 µm. These same 15 models are scanned 3 times using a dental stereoscopic IOS Condor (SAS Condor France) by 3 different operators. They allow to get 45 x 3 is 135 STL/PLY files (3 models by 3 operators). This manual scanning must be done within a reasonable timeframe, i.e. not to exceed one and a half minutes on the dental preparation or reference piece and two and a half minutes for a complete arch. Each of the 135 PLY/STL files obtained using the Condor camera are compared with 15 reference STL files using the CloudCompare V2 software. Precision histograms are generated based on comparisons with scans from other IOS systems.

Comparisons show an accuracy between 20 and 50 µm between the reference pieces and the dental preparations (on more than 80% of the points) and an accuracy between 20 and 150 µm on the dental arch (on more than 75% of the points). These measurements do not include the inherent tabletop scanner error.

The new intraoral scanner Condor, entirely software dependent, uses a stereoscopic method with a fixed focal. It's the accuracy equals of three reference scanner's present on the market.

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Poster P.115

CARIES-REMOVAL EFFECTIVENESS AND MINIMAL-INVASIVITY OF CARIES-EXCAVATION TECHNIQUES: A CLINICAL AND MICROBIOLOGICAL STUDY.

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To compare four alternative caries-excitation techniques with the traditional one in 50 primary molars.

A randomized-controlled-clinical-trial was designed and performed at the Dental Clinic of the University of Sassari. Healthy children (7–12 yrs, mean age 9.3) with one or more D1-D3 lesions involving at least one surface of primary molars prone to the exfoliation were invited to participate. Five different treatment protocols were applied and the teeth were

156 restorations (I and II class) were performed on patients entering the following inclusion criteria: age 18–65, indication for Class I or II restorations, replacement of insufficient restorations or extensive primary caries, max. 4 restorations per person, vital teeth and sufficient command of the language. Cavities were measured, picture of all clinical passages were taken teeth were divided into 3 groups according to the adhesive employed: G1) Futurabond U; G2) Scotchbond Universal; G3) AllBond Universal. Each group was divided in 2 subgroups according to the application mode (E&R or SE). All restorations were filled with a composite (Grandioso, Voco). Each treated patient was, later, given a VAS scale form to fill in during the seven days following the clinical performance. Pain and tooth sensitivity was assessed at seven days' control and a clinical evaluation of the restoration overtime was done at 12 months follow up following the USPHS criteria. Data were statistically analyzed using ANOVA test and Tukey post hoc test. Statistical significance was set for $p < 0.05$.

The statistical analyses showed that the clinical performance of the composite restoration performed was not influenced by neither the three adhesive systems employed ($p = 0.876$) neither by the application mode of the adhesives (etch&rinse vs self-etch) ($p = 0.0943$) at twelve months recall.

The application mode does not influence the 1-year performance of universal adhesives. Longer follow-up is necessary to obtain more evident results.

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Poster P.110

24 MONTHS CLINICAL EVALUATION OF ADHESE UNIVERSAL AS AN ETCH-AND- RINSE ADHESIVE

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The aim of this prospective study was the evaluation of the clinical behaviour of Adhese Universal in conjunction with the total-etch technique compared to Excite F etch&rinse adhesive. Particularly the occurrence of immediate postoperative sensitivity was evaluated, in addition to the semi-quantitative analysis of the clinical behavior through SQUACE and FDI criteria.

102 restorations (I and II class) were performed on patients entering the following inclusion criteria: age 18–65, indication for Class I or II restorations, replacement of insufficient restorations or extensive primary caries, max. 4 restorations per person, vital teeth and sufficient command of the language. Cavities were measured, picture of all clinical passages were taken teeth were divided into two groups according to the adhesive employed: G1) restorations performed with Adhese Universal E&R mode; G2) restorations performed with Excite F adhesive employed as suggested by manufacturer instructions. All restorations were filled with a bulk fill composite (TetricEvo Ceram Bulk Fill, Ivoclar). Each treated patient was, later, given a VAS scale form to fill in during the seven days following the clinical performance. Pain and tooth sensitivity was assessed at seven days' control and a clinical evaluation of the restoration overtime was done at 6, 12 and 24 months follow up following the SQUACE and FDI criteria. Data were statistically analyzed using ANOVA test and Tukey post hoc test. Statistical significance was set for $p < 0.05$.

Statistical analyses showed no significant differences for both pain and sensitivity for the two adhesives employed. For both pain and sensitivity a noticeable decrease in patient perception was found starting from day 3.

With regard to SQUACE and FDI values no differences were detected at 24 months.

Adhese Universal adhesive employed in E&R shows a clinical behaviour similar to that of a well known etch-end-rinse adhesive already established on the market.

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Poster P.111

3-YEARS CLINICAL EVALUATION OF ADDITIVE COMPOSITE RESTORATIONS ON ANTERIOR TEETH

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To evaluate the clinical performance of composite additive direct restorations on anterior sound teeth, performed with 2 different nanofilled composite materials.

All patients who presented anterior teeth with diastema to be restored on sound enamel were enrolled in this prospective randomized study. After radiograph evaluation, patients were randomly divided in two groups according to the composite material. G1: Clearfil ES2, Kuraray; G2: Asteria, Tokuyama. All restorations were performed by the same operator, following a standardized procedure: rubber dam positioning, teeth surface cleaning with pumice, enamel surface sandblasting with 50µm aluminium oxide and water rinse, 30 seconds enamel etching with phosphoric acid, application of bonding resin (Optibond FL, Kerr) on demineralized enamel and 40 sec light-curing, composite layering with the use of silicon index obtained by a wax-up. After finishing and polishing procedures, patients were dismissed and schedule for recall visits after 7 days, 6, 12, 24 and 36 months. During recall, the restorations were examined and evaluated by two blinded calibrated operators in accordance with FDI and USPHS criteria.

A total of 32 patients (G1: n=19; G2: n=13) received 97 restorations, 57 with Clearfil ES2, 40 with Asteria. The 3-year survival rate was 100% for both composites. The statistical analysis revealed no differences between the two composites that had been used. However, an initial degradation of margin quality (G1: 10.1%; G2: 12.7%), marginal ditching (G1: 4.7%; G2: 7.7%) and surface texture quality decrease (G1: 15.7%; G2: 18.5%) were observed after 3 years.

The 3-year survival rates showed that nanofilled composites performed well in diastema closure treatment with direct techniques. All restorations exhibited excellent scores and the initial degradation observed could be easily solved, suggesting that the direct approach is an excellent minimal invasive technique. Further controls are necessary to evaluate the clinical performance in the long period.

Operative Dentistry

Poster P.112

A MICROSCOPIC MARGINAL SEAL EVALUATION OF BULK-FILL COMPOSITE RESTORATIONS USING AN UNIVERSAL ADHESIVE SYSTEM IN SELF-ETCH AND ETCH&RINSE MODE

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