SCREW-RETAINED *VS* CEMENT RETAINED CR-CO-CERAMIC IMPLANT-SUPPORTED SINGLE CROWN: A RADIOGRAPHICAL, CLINICAL AND BIOCHEMICAL EVALUATION

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Aim: the analysis that was conducted in this study considered the aspects of the overt damage (periodontal indices and standardized radiographic measurements) and the indices of possible damage (pro-inflammatory cytokines) which now represent a concrete help in diagnosis and prognosis.

Methods: the present study was designed to compare peri-implant soft and hard tissue response after 2 years of functional loading between direct screw-retained posterior single crowns in Cr-Co/Ceramic or cement-retained Cr-Co/Ceramic on titanium abutment. Overall, 24 non-smoking partially edentulous patients, requiring implant therapy for a prosthetic rehabilitation in at least two contralateral sites of the mandible or maxilla, were included in the study. The values of Il-1β, IL-6, IL-8 were evaluated, together with the periodontal indices PI, GI, PD, BOP, REC. The PICF was collected with standardized paper strips. A repeated measure ANOVA was used between groups months at 1, 3, and 12 months.

Results: during the time of clinical observation, at t0 (1 month from the delivery), t1 (3 months after the delivery) and t2 (12 months after the delivery), both types of crowns performed satisfactorily from a clinical point of view. In light of the results obtained, it is possible to define that screwed Cr-Co/Cer has slightly higher values than the other.

Conclusions: it is possible to hypothesize, and confirm through subsequent or longer-term studies, that this difference could lead to a clinically visible difference between these two prosthetic solutions in the longer term. The single screwed crown in Cr-Co shows a different interface with the titanium implant connection compared to the titanium-titanium contact of the connection between the implant and the titanium abutment for the cement-retained prosthetic solution.

MARGINAL FIT OF NANOCOMPOSITE 3D PRINTED CROWNS WITH HORIZONTAL AND VERTICAL PREPARATION GEOMETRIES: AN *IN VITRO* COMPARATIVE ANALYSIS

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Aim: the study aimed to evaluate the marginal adaptation of crowns with horizontal or vertical margins, made by a 3D printer.

Methods: two abutments of a maxillary first premolar were designed using CAD software, one with a Horizontal preparation (Ho), the other with a Vertical one (Ve), then they were 3D printed in resin and placed on a reference typodont. Ten crowns were made for each geometry, using the DFAB 3D printer (DFAB CHAIRSIDE, DWS SYSTEMS, Thiene, Italy). For each one, cementation was simulated with polyether, then the crowns were scanned with an industrial metrological device (Atos Core 80; GOM GmbH, Braunschweig, Germany). Finally, the scans were analyzed using dedicated software (Geomagic Control X, Raindrop Inc., Morrisville, USA) to assess the marginal fit. In addition to descriptive statistics (95% confidence interval), an independent sample test with a significance level of a = .05 was conducted to compare the differences between the groups.

Results: the mean values of the marginal fit for both preparation geometries were below the clinically acceptable threshold (120 um), Ho: 76,83 um; Ve: 84,37 um. No statistically significant differences were evidenced between the experimental groups: Ho = 0,58; Ve = 0,83.

Conclusions: the tested nanocomposite crowns showed mean marginal discrepancies within clinically acceptable values both for vertical and horizontal geometries, with no statistically significant differences.

Doi: 10.19256/abstract.cduo.14.2025

COMPARATIVE ANALYSIS OF SCAN TIME AND CHAIRSIDE CAD DESIGN QUALITY IN THREE GROUPS OF OPERATORS WITH DIFFERENT EXPERIENCE: AN *IN VITRO* STUDY

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Aim: this study aimed to evaluate differences among three groups of dental operators with different expertise levels in intraoral scan time and chairside CAD crown design quality.

Methods: thirty operators were recruited, including 10 sixth-year Dental Students (DS), 10 General Practitioners (GP) and 10 Experienced Prosthodontists (EP). A reference model was used with horizontal preparation and a supragingival margin at the lower second premolar. Each operator performed 3 scans of the model and created a CAD design of the crown. The scanning times were recorded with a stopwatch, while the design quality was evaluated by three expert operators with a VAS scale. Normality tests and the Kruskal-Wallis test were performed.

Results: statistical analysis regarding scan time showed these confidence intervals: DS 204-259,60; GP 155,68-193,12; EP 56,31-83,69, while, about VAS Scale: DS 6,92-8,28; GP 8,12-9,28; EP 8,92-10,28.

The normality test showed that there is no normality between the samples ($p > 0.005$) while the Kruskal-Wallis test revealed statistically significant differences between the student group and the experienced prosthodontist group, both in terms of scanning time ($p = .002$) and CAD design quality ($p = .012$). No statistically significant differences were highlighted between the student group and the general practitioners group.

Conclusions: within the limitation of this study, all operators produced clinically acceptable scans and crowns; however, as far as the operator's experience increases, better results are observed.

STRESS DISTRIBUTION IN POSTERIOR TEETH RESTORED WITH DIFFERENT CORE MATERIALS UNDER A FIXED ZIRCONIA PARTIAL DENTURE: A 3D-FEA STUDY

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Aim: to evaluate the effect of different substrate stiffness i.e. Sound Dentin (SD), Resin composite Core (RC) or Metal Core (MC) on the stress distribution of a zirconia posterior three-unit Fixed Partial Denture (FPD).

Methods: the abutment teeth, first molar and first premolar, were modeled with an axial reduction of 1.5 mm and converging axial walls. A static structural analysis was conducted using the finite element method and the maximum principal stress criterion to evaluate the Fixed Partial Denture (FPD) and the cement layers of both abutment teeth. The materials were assumed to be isotropic, linear, elastic, and with bonded contacts. An axial force of 300 N was applied to the occlusal surface of the second premolar.

Results: the region of the prosthetic connectors showed the highest tensile stress magnitude in the FPD structure depending on the substrate stiffness with different core materials. The highest stress peak was observed with the use of MC (116.4 MPa) compared to RC and SD. For the cement layer, RC showed the highest values in the molar abutment (14.7 MPa) and the highest values for the premolar abutment (14.4 MPa) compared to SD (14.1 and 13.4 MPa) and MC (13.8 and 13.3 MPa). Both MC and RC produced adequate stress concentration in the zirconia FPD during the load incidence.

Conclusions: the present study showed that the choice of the cast core and metallic post by the resin composite core and fiberglass post did not improve the biomechanical behavior of the FPD.

This choice must be performed based on clinical criteria (other) than mechanical.

IN VITRO ANALYSIS OF MARGINAL ADAPTATION AND FRACTURE RESISTANCE OF ENDO-CROWNS DIGITALLY MADE IN TWO DIFFERENT MATERIALS

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Aim: an endocrown is a one-piece restoration that replaces the entire crown of a tooth, utilizing an extension into the pulp chamber and relying on occlusal adhesion principles. It can be a viable alternative for restoring endodontically treated teeth.

Methods: after preparation, and 7 days of storage at 37 °C and 100% humidity, a digital impression was obtained with a Trios 5 scanner, and sent to the lab, where the endocrown design was performed on EXOCAD, same design in two different materials (ZR and LD). From the digital files, 4 epoxy resin framework models were produced as to proceed with the bonding procedures and marginal gap analyses. To proceed with bonding the endocrowns, the internal surface was treated with 5% hydrofluoridric acid for 20 seconds for the LD group, while, for the ZR group, endocrowns were airborne particle abraded. The samples were bonded with a dual-polymerizing resin cement, under finger pressure for 60 seconds.

Results: statistical tests revealed a significant difference between the different groups. Tukey testing demonstrated that ZR has the highest fracture toughness values compared to LD. At significantly lower values the LD showed fractures which were sometimes even restorable. In contrast, Zr showed clear fracture margins.

Conclusions: the choice of different materials affected the fracture resistance of this kind of restoration. The possibility of producing these restorations in a full digital workflow, also considering the coronal position of the finishing line compared to other restorations, guarantees a favorable factor.

THE BRIDGING PHENOMENON IN INTRAORAL SCANNING: AN *IN VITRO* COMPARISON OF ACCURACY OF DIFFERENT IOS SYSTEMS FOR ONLAY PREPARATIONS

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Aim: the aim of this in vitro study was to assess the presence of “bridging” between digital surfaces of adjacent teeth, with six different intraoral scanners.

Methods: four typodonts were fabricated using a dedicated 3D printer and polyurethane resin. Each typodont featured an onlay preparation on the first molar, showing different spaces between the prepared tooth and the adjacent one (0.1, 0.3, 0.5, and 0.7 mm). Ten scans were made with six different intraoral scanners and the bridging areas measured by using a dedicated metrological software.

Descriptive statistics (means, 95% c. i., standard deviation, etc.) and post-hoc tests were conducted.

Results: the results showed that at 0.1 mm the means ranged from 4.35 to 5.60 mm²; at 0.3 mm from 1.57 to 5.11 mm²; at 0.5 mm from 2.00 to 4.75 mm²; at 0.7 mm from 2.03 to 4.35 mm². The Friedman test revealed statistically significant differences among the experimental groups.

The Bonferroni test confirmed statistically significant differences among the analyzed IOS systems at interproximal distances of 0.1, 0.3, 0.5, and 0.7 mm.

Conclusions: within the limitations of the present study, bridging between adjacent digital surfaces was observed in each tested group (0.1, 0.3, 0.5, and 0.7 mm). The values at 0.7 mm seem to be potentially acceptable for clinical use.

COMPARATIVE ANALYSIS OF EDENTULOUS FULL-ARCH IMPLANT IMPRESSIONS: CONVENTIONAL SCAN BODIES *VERSUS* SCAN BODIES WITH AUXILIARY GEOMETRIC DEVICES

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Aim: this study aimed to assess the effectiveness of an Auxiliary Geometric Device (AGD) in enhancing the trueness of complete arch implant impressions. The primary metrics of interest were total surface deviation (TotRMS), centroid (cRMS) and angular. All these values are crucial for achieving a precise fit in implant-supported prostheses.

Methods: a gypsum-based edentulous maxillary model with four multi-unit abutment replicas was prepared, replicating clinical scenarios. Control and experimental scan bodies were scanned using an intraoral scanner (Dexis 3800), and the resulting data were compared to a digital master model created with a structured light scanner (ATOS compact Scan 5M). The AGD was used to reduce positional errors. Data was processed using Exocad and GOM Inspect Professional software, aligning scan body library files with mesh data using a best-fit algorithm. A sample size of 20 scans per group was determined a priori, and statistical comparisons were made using Mann-Whitney U tests.

Results: the inclusion of the AGD significantly reduced centroid RMS values in all measured comparisons ($p < 0.001$), demonstrating enhanced trueness. Total body RMS values also showed a significant reduction ($p = 0.002$). While overall angular deviation differences were not statistically significant (meanAGD = 0.38; meanNO = 0.39), site-specific analysis revealed significant improvements at points 2.4 ($p = 0.017$) and 1.4 ($p < 0.001$). The Euclidean distance in platform deviation indicated better alignment in the AGD group.

Conclusions: the AGD significantly improved the trueness of complete arch implant impressions, particularly in reducing centroid and total body RMS values. These findings highlight the AGD's potential to enhance digital workflows in implant dentistry by mitigating positional discrepancies and ensuring greater precision.

DIGITAL TOOLS FOR THE CLINICAL MONITORING OF THE EDENTULOUS PATIENT: USE OF INTRAORAL SCANNER (IOS), BEHAVIORAL ANALYSIS AND THE PROPOSAL OF A NEW INDEX

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Aim: this study aimed firstly to assess whether edentulous patients properly trained by a dentist and a hygienist show a different plaque retention at the intaglio surface of Full Dentures (FD) compared to untrained patients; secondly, to propose a new digital index for the denture hygiene.

Methods: thirty edentulous patients were enrolled and randomly assigned to a "Trained" (TG) or "Control" Group (CG). TG received practical demonstrations on home hygiene procedures, while CG only received written instructions. At baseline and 1 year follow-up, a plaque detector was used in the FD intaglio, then a photographic documentation and an intraoral scan of the FD were performed. The scan data were analyzed by Meshlab software to calculate "Zarone Index", detecting the percentage of denture surface covered with plaque.

Results: power analysis confirmed the study's statistical validity. Normality and homogeneity of variance tests were performed. The Welch test showed statistically significant differences ($p < 0.001$) between the "Trained Baseline" and "Trained Follow-up" groups, as well as between the "Trained Follow-up" and "Control Follow-up" groups. No significant differences between the "Control Follow-up" and "Control Baseline" groups were evidenced.

Conclusions: trained patients showed statistically and clinically significant improvements in the care and home hygiene of their prostheses.

This highlights the importance of a collaborative approach between dentists and patients. This preliminary data will be implemented in a longer follow-up.

PROSPECTIVE CLINICAL STUDY TO EVALUATE THE IMPLANT-PROSTHETIC APPROACH FOR THE REHABILITATION OF MAXILLARY LATERAL INCISORS AGENESIS WITH A DIGITAL WORKFLOW

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Aim: this prospective study aimed to evaluate the survival and success rates of single implant-supported zirconia crowns produced using a full digital workflow for the rehabilitation of patients with mono- or bilateral agenesis of the maxillary lateral incisors, with a four-year follow-up. Additionally, technical and biological parameters influencing prosthetic rehabilitations, such as patient satisfaction levels, were assessed.

Methods: twenty-two patients with monolateral or bilateral agenesis of the maxillary lateral incisors were included in the study, and 30 narrow-diameter implants were placed. Thirty screw retained monolithic cubic zirconia (5Y-TZP) crowns with an internal connection were produced. Objective evaluations were performed using the Functional Implant Prosthodontic Score (FIPS), while patient satisfaction was assessed using Visual Analog Scale (VAS). Descriptive statistical analysis was conducted using the Kaplan-Meier method.

Results: after four years of clinical function, the mean FIPS score was 9.2, while the mean patient satisfaction score was 8.7. The Kaplan-Meier survival analysis reported a cumulative success rate of 93.3% and a cumulative survival rate of 100% at the four-year follow-up.

Conclusions: implant-prosthetic rehabilitation using a full digital workflow has proven to be an effective and predictable solution for the functional and esthetic restoration of patients with maxillary lateral incisor agenesis in the short term. However, further clinical studies are needed to validate the long-term reliability of this therapeutic approach.

GNATHOLOGICAL FUNCTION EVALUATION USING BRUXOFF® IN EDENTULOUS PATIENTS REHABILITATED WITH IMMEDIATELY LOADED FULL-ARCH RECONSTRUCTIONS *VS* DENTATE SUBJECTS: A PILOT CLINICAL STUDY

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Aim: to compare the gnathological function of edentulous patients rehabilitated according to the Columbus Bridge Protocol™ and that of dentate subjects by an overnight domestic monitoring device (i.e., Bruxoff®).

Methods: test edentulous patients rehabilitated with immediately loaded full-arch reconstructions (Test) at the Dept. of Oral Rehabilitation and Maxillofacial Prosthesis, University of Turin, were selected based on the following criteria: age >18 years; FMPS, FMBS <25%; reconstruction in situ ≥6 months. Exclusion criteria: periodontal disease (Stage II-III-IV), peri-implant pathology, diseases or drugs affecting the neuromuscular system. Ten subjects with a natural healthy diatoric dentition up to the first molar (Control) were matched to the Test. The gnathological function was recorded following a previously validated methodology (randomly selection of 3 nights over 3 weeks with at least 4 hours of sleep per night), avoiding caffeine, alcohol and tobacco 6 hours prior.

Results: the study is still ongoing, with 4 patients per group recruited so far. The mean age was 65±8.49 years (Case) and 62.8±3.86 (Control) (p >0.05). Dentate subjects had a mean of 24±3.37 teeth. The Case group included 2 patients with a superior all-on-four and 2 with both upper and lower rehabilitations. The mean bruxism index (episodes of bruxism per hour) was 5.2±2.39 (Control) and 4.3±4.69 (Case) (p >0.05).

Conclusions: based on these preliminary results, no statistically significant difference in the gnathological activity was observed between Test and Control subjects. Such results have to be validated in a larger sample.

ASSESSMENT OF ACCURACY AND EFFECTIVENESS OF DIGITAL SCAN TRANSFER PROTOCOLS TO IMPROVE PASSIVATION IN IMPLANT-SUPPORTED FRAMEWORKS: A COMPARATIVE STUDY

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Aim: digital scanning in dental implantology ensures greater speed and precision during data acquisition, as well as greater comfort for the patient. Advanced scan protocols (CSS|Strategy, Re|Scan, De|Bug) have been tested on cast, milled, and printed bars to assess their effects on prosthetic passivation. This study aims to validate the effectiveness of scan transfers in minimizing inaccuracies and achieving complete passivation of implant-supported frameworks. By reducing biomechanical stress, this approach is anticipated to enhance the longevity and clinical performance of the prosthetic structures.
Methods: conventional scan bodies and scan transfers were positioned on edentulous models. Data acquisition involved intraoral scanning with three digital protocols (CSS|Strategy, Re|Scan, De|Bug), compared to laboratory-scanned reference models. Adaptation accuracy was evaluated using 3D deviation analysis, prosthetic gap measurements, and mechanical and digital passivation tests.
Results: preliminary data suggest that scan transfers and digital protocols significantly reduce prosthetic misfit, maintaining deviations within clinically acceptable limits. Digital workflows exhibited superior precision and consistent repeatability.
Conclusions: scan transfer is confirmed as a reliable technique for full-arch implant prostheses, highlighting the precision and efficiency of digital workflows, enhancing clinical outcomes.

FLEXURAL STRENGTH OF 3D PRINTED RESIN-BASED DENTAL BRIDGES WITH DIFFERENT CONNECTOR SIZES AS A FUNCTION OF CEMENT TYPE: AN *IN VITRO* STUDY

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Aim: today 3D printing is fully incorporated in digital workflows in prosthodontics. 3D printed composite has proved to be a valid short-term option for interim restorations, but there is no evidence about the possible impact of cement type or connector size on its long-term resistance for fixed bridges. The aim of this study is to test the Flexural Strength (FS) of 3D printed resin bridges luted differently.
Methods: a digital light processing 3D printer (Asiga MAX UV, NSW, Sydney) was used to fabricate 80 sample bridges with TempPrint GC: 40 with 5 x 5 connector size, and 40 with a 3 x 3 connector. The 2 groups of 3-unit bridges were divided into 4 subgroups, one for each type of luting: TempBond, Ketac Cem, G-Cem One, and no cement. The specimens were subjected to the three-point bending test, using a universal testing machine (5567 Instron Ltd, USA) to measure FS, which is considered the key factor for long-lasting restorations. Means and standard deviations were calculated for each group, and statistical differences were assessed using one-way ANOVA and Kruskal-Wallis tests ($p < 0.05$).
Results: statistically higher values of FS were recorded for the samples with 5 x 5 connector size, compared to 3 x 3. No statistically significant difference between the tested cements was recorded in the 5 x 5 group. Conversely for the 3 x 3 group, G-Cem One values (343±17) were significantly higher than the other cements.
Conclusions: connector size has a statistically significant impact on the FS of 3D printed bridges, while luting agent can only influence the FS of bridges with smaller connectors.

COMPARISON OF TWO DENTAL STEROPHOTOGRAMMETRY DEVICES IN FULL-ARCH IMPLANT RIABILITATIONS: AN *IN VITRO* STUDY

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Aim: to evaluate and compare the precision of two stereophotogrammetry devices (SPG-1 and SPG-2) for full-arch digital implant impression.

Methods: a desktop scanner was used for digitizing an edentulous mandibular model with four analogs to generate 10 reference files.

Both SPG-1 and SPG-2 were used for taking 10 impressions of the model and the resulting 20 test files were aligned with the reference file via software to detect the 3D precision of both the devices between every analog. The data were compared using a One-Way ANOVA test.

Results: no significant overall 3D discrepancy were detected among SPG-1 and SPG-2 in the mean (<0.001).

Conclusions: although there are limitations to the study, both SPG-1 and SPG-2 seem to be dependable for full-arch digital implant impressions.

ADHESION OF ZIRCONIA TO ENAMEL-DENTINAL TISSUES, EVALUATION AFTER AGING OF TENSILE BOND STRENGTH VALUES AND SAMPLE ANALYSIS OF SURFACES

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Aim: the aim of the study was to evaluate the mechanical behavior of the adhesion interface between a zirconia sample cemented with an adhesive technique to a tooth whose prosthetic preparation excluded any type of mechanical retention. The hypothesis that was put forward was that mixed or cohesive fractures were obtained following aging caused by the failure of the adhesion between zirconia and enamel or dentin.

Methods: 18 molars extracted for periodontal or orthodontic reasons were selected based on criteria of complete integrity of the enamel-dentin structure and absence of caries or dischromia. The occlusal surface of each specimen was reduced with a standard-grit diamond wheel bur. The next step was to take a fingerprint of each sample preparation. Subsequently, 18 artefacts were created by milling a rough zirconia disc. Each monolithic model was made on one side with a surface conforming to the prosthetic surface of the dental sample, and on the other with a ring of standardized size; the adhesion protocol was then carried out. Samples joined to the models were subjected to tensile tests to evaluate the bond strength established between the two surfaces following cementation.

Results: it was possible to conclude the existence of cohesive and mixed fractures with a relative frequency in more than half of the analyzed samples, slightly higher than adhesive fractures. This result suggests a positive degree of efficacy of the current adhesive protocol for zirconia based on mechanical and chemical conditioning of the ceramic with alumina oxide sandblasting, application of 10MDP-based primer and use of a dual-curing composite cement.

Conclusions: considering what was observed in this study, adhesive cementation of zirconia has been shown to create a strong bond with the dental substrate.

HOW SHOULD THE DIGITAL TECHNOLOGIES IMPROVE THE REHABILITATION WITH MAXILLOFACIAL PROSTHESIS?

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Aim: the aim of this study was to assess the advancement of dentistry technologies, such as the use of CAD-CAM, applied to the manufacturing of a maxillofacial prosthesis.
Methods: the online literature search of studies published between January 1, 2015, and February 29, 2025, was performed using specific word combinations on PubMed search engine. The outcome was to analyze the precision of the digital impression, the patient's comfort and the manufactured prosthesis quality compared to traditional techniques.
Results: the search generated 244 potential studies. After screening procedures only 1 clinical trial fulfilled exclusion criteria and was selected for quantitative and qualitative analysis.
Conclusions: based on the evidence presented by the selected study there was no significative difference in precision between digital and traditional impression and the cast obtained from the digital impression was suitable for clinical use. The results of the study were used as a starting point for the treatment of a challenging maxillofacial case.

DIFFERENT ANTERIOR DENTAL CHARACTERISTICS IN PROSTHETIC REHABILITATIONS IN RELATION TO FACIAL ANATOMY

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Aim: the selection of prosthetic dental elements is important because it has been proven that a smile with good aesthetic characteristics helps to achieve a good quality of life, both physical and psychological. Studies on the correlation between anterior teeth form and face shape can help dentists achieve predictable results in prosthetic treatment.
Methods: numerous studies have been considered, both in English and in other languages, published from 1975 to 2023, from different electronic databases (PubMed, Google Scholar and Scopus). The main topics used as keywords were: "facial landmarks and dental proportions", "teeth and face shape", "esthetic proportions of maxillary teeth" and "dental esthetics".
Results: the positioning of the dental arches plays an important role: the transverse occlusal plane should be parallel to the bipupillary line. The interalar nasal width is related differently to the intercanine distance depending on ethnicity. The bizygomatic width is related to the width of the central incisor and this is called the "Berry index", it is equal to 1:16 and is also used in forensic dentistry. The most recent studies use latest generation softwares to reconfigure the smile arch and the shape of individual teeth. Technologies such as the spectrophotometer can identify the best color of the teeth in relation to the face.
Conclusions: gender and ethnicity are parameters that influence both the size of the teeth and the length/width ratio. The dimensions of the face that are most related to those of the teeth are interalar width, bizygomatic width and bipupillary line.

A SYSTEMATIC REVIEW OF LITHIUM DISILICATE ENDOCROWNS *VS* POST-AND-CORE RESTORATIONS FOR POSTERIOR TEETH

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Aim: this systematic review aims to compare the physical and mechanical properties of Lithium Disilicate (LDS) endocrowns with post-and-core retention systems for posterior teeth.

Methods: PRISMA guidelines were followed for the review. They were found that systematic electronic search had done in PubMed-Medline, Scopus, Embase and ISI Web of Knowledge (WoS) for the studies recorded until January 31st, 2023. The QUIN was used to assess the quality and risk of bias of the studies. Of the 291 identified articles, 10 met the eligibility criteria.

Results: all reported studies compared LDS endocrowns with various post-and-core crowns made from various materials. No trends were found consistent with restoration type for fracture strength. In addition, LDS endocrowns exhibited a comparable failure mode with post-and-core crowns.

Conclusions: the tested LDS retainers at an angle of 45° showed superior fatigue failure patterns in contrast to their counterparts but as for the current evidence they are not inferior to the performance of post-and-core in terms of fracture strength and failure patterns. Standardized testing protocols are necessary, though (by consequence) to permit accurate comparisons. It is necessary to carry out long-term clinical studies to determine survival rates, mechanisms of failure, and complications of these restorative therapies.

EPITHESIS OF THE FUTURE: A NEW DIGITAL APPROACH APPLIED TO MAXILLOFACIAL SURGERY

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Aim: the study describes the creation of a cheek epithesis using an innovative technique. This procedure includes both an analog and a digital section.

Methods: in our case, the patient, affected by a severe condition that damaged part of her face, required the creation of a cheek epithesis. Two different techniques were used to create epithesis. Initially, a fully analog epithesis was made, and then, for a better result, a digital procedure was employed. With this latter technique, it was possible to capture the patient's facial impression, not using alginate but through a program that allowed for a complete scan of her face. The resulting file was then sent to the dental technician, who, using a 3D printer, generated a model from which all necessary information was obtained to create the final epithesis using traditional procedures.

Results: it is evident that with the introduction of the digital component, the work of the dentist and dental technician is expedited and simplified. Consequently, this technique is also advantageous for the patient, as the number of appointments is reduced, and the patient is not subjected to invasive or complex procedures.

Conclusions: the creation of the cheek epithesis, thanks to the introduction of facial scanning, allowed for the realization of a epithesis device that accurately reflects the patient's facial features, and this was achieved in a shorter time compared to traditional methods.

CLINICAL IMPLICATIONS OF CLOUD-BASED DIGITAL SMILE DESIGN IN PLANNING AND IMPLEMENTATION OF AESTHETIC RESTORATIONS USING FLOW INJECTION

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Evaluate the effectiveness of cloud-based digital smile design in the planning phase of the flow injection technique. Evaluate the effectiveness of aesthetic restorations obtained with flow composite material from both an aesthetic and functional perspective. Clinical examination of the patient aimed at evaluating their expectations, scanning of the dental arches with an intraoral scanner, design of the diagnostic wax-up with cloud-based digital smile design from which a silicone matrix is obtained. The matrix is applied to the arch requiring restorations, serving as a mold for the injection of flowable composite. Once the restorations are completed, finishing and polishing phases follow. Evaluation of the aesthetic and functional outcome for the patient. The patient completes a questionnaire to assess their level of satisfaction.

Flow injection is a technique used for the creation of aesthetic restorations using flowable composite material that implements therapeutic alternatives for aesthetic restorations, offering a faster and more economical solution. In this case, there is the advantage of using cloud-based digital smile design software that gives us a preview of the final work in addition to providing the diagnostic wax-up that will be used for the creation of the silicone mask.

A TOOL TO DETERMINE THE POSITION OF THE ANTI-TIPPING IN SKELETAL PROSTHESIS

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Aim: the study analyzes the use of a new tool for the search for the third point or indirect retention in removable partial dentures (RPD). The tool allows to identify the element responsible for counteracting the forces dislocated on the rotation axis of the RPD, canceling the distal lifting of the prosthetic device.

Methods: gypsum models representing Kennedy Class I and II, a parallelometer, Triangle C, an equilateral triangle with a side of 2.2 cm, were selected. During the design, Triangle C was positioned with the base facing the maxillary tuberosities and the apex at the level of the interdental papilla in the upper model and positioned with the base facing the retromolar trigones and the apex between the two central incisors in the lower model. The lines drawn from the center of the base to the lateral sides of the triangle identified the optimal support points against tipping. For verification, the models were sent to a laboratory in the skeletal department.

Results: in selected cases of Kennedy Class I and II, the use of the instrument allowed to identify the points where to place the indirect retention, and the area in all those cases in which the antagonist did not allow the positioning.

Conclusions: the design of the prosthesis using the Triangle C was effective in determining the support points for the dislocating forces in the RPD, especially in cases of Kennedy Class I and II except in cases in which the maxillary or mandibular arch is narrow and elongated, in cases of Class III and IV, the direct retention already has the anti-tipping function.

RETROSPECTIVE CLINICAL EVALUATION OF NON-ENGAGING ABUTMENTS USED FOR MULTI-UNIT SCREW RETAINED FIXED PROSTHESIS

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Aim: this retrospective study aimed to assess how non-engaging abutments perform clinically in multi-unit implant-supported restorations and to examine how different abutment combinations and clinical factors affect biological and technical outcomes.

Methods: the study included 40 patients, 90 implants, and 40 Fixed Dental Prostheses (FDPs). The prostheses were supported by either only non-engaging abutments or a mix of non-engaging, engaging, and multi-unit abutments. Clinical evaluations included implant and prosthesis survival, Probing Pocket Depth (PPD), Bleeding on Probing (BoP), Marginal Bone Loss (MBL), and the frequency of biological and technical issues. ANalysis Of VAriance (ANOVA) was used to compare the three groups, with Tukey's post-hoc test applied where needed. A p-value of less than 0.05 was considered statistically significant.

Results: both implant and prosthesis survival rates were 100%. The average MBL was 0.53±0.33 mm, and the average PPD was 4.2±0.75 mm. There were no cases of peri-implantitis, while mucositis occurred in 11.11% of implants. No significant differences were observed between the different abutment configurations in terms of biological outcomes or complications. The overall rate of technical complications was 5%.

Conclusions: non-engaging abutments showed promising short-term clinical performance with low rates of biological and technical complications. They appear to be a reliable option for supporting multi-unit prostheses, though further long-term studies are recommended.

THE OUTCOME OF CERASMART® RESTORATIONS IN PATIENTS WITH SIGNS OF BRUXISM: A 7-YEAR CASE-CONTROL RETROSPECTIVE STUDY

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Aim: bruxism in the form of clenching and/or grinding of the teeth has been taught to be an important risk factor in prosthodontics. The aim of this research paper is to retrospectively investigate the success rate of CeraSmart®, a nanoceramic resin-based material, in patients with and without signs of bruxism.

Methods: for the purpose of this study, a total of 98 patients who received one crown made with Cerasmart® at the University of Siena, Siena, Italy, were recalled. The average follow-up was 7±1.3 years. The outcome was evaluated according to the modified US Public Health Service [USPHS] criteria, assessing marginal adaptation (MARA), COlor Alteration (COA), MARginal Discoloration (MARD), REStoration Fracture (RESF), Tooth FRAtcture (TFRA), REStoration Wear (RESW), ANtagonist Tooth Wear (ANTW), CARies Presence (CARP), and POSTperative Sensitivity (POSTS). Patients were divided into bruxers and non-bruxers according to the Standardized Tool for the Assessment of Bruxism (STAB). A chi-square test and a multiple logistic regression were performed, using the endodontic tooth, the arch (upper/lower), the tooth restored (molar/premolar), and bruxism (yes/no) as dependent variables. The level of significance was set at $p = 0.05$.

Results: a significant difference between the bruxers and non-bruxers was present for the REStoration Fracture (RESF) variable ($p = 0.0019$). Moreover, between the two groups, a significant difference in the number of crowns that need replacement was found ($p < 0.05$). The logistic regression showed that bruxism is the only variable contributing to the significantly higher failure rate ($R^2 = 0.22$).

Conclusions: the findings of this study suggest that prior to the prosthodontic restoration of a tooth, an accurate assessment of bruxism should always be performed, as it could contribute to a higher failure rate.

A NOVEL PROTOCOL FOR INJECTION MOLDING TECHNIQUE: THE CUSTOMIZED HYBRID INDEX (CHI) APPROACH

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Aim: this article aims to present an innovative clinical protocol for the Injection Molding Technique (IMT), an advanced approach in restorative dentistry designed to enhance both the esthetics and function of teeth. Specifically, it introduces the use of a novel Customized Hybrid Index (CHI) that expands the application potential and improves esthetic outcomes compared to the traditional technique.

Methods: the traditional IMT relies on a silicone index and a single layer of flowable composite to reproduce the digital or analog wax-up design into a final restoration. The new protocol incorporates a Customized Hybrid Index (CHI), which enables the use of both flowable and heated (thermoviscous) composites. The CHI consists of a multilayer hybrid stent combining: a highly transparent 60 Shore A silicone for material injection, a 70-80 Shore A silicone for distal support, and a rigid thermoformed resin shell for outer stabilization. The injection holes are calibrated based on the specific delivery system used (compule or syringe).

Results: the use of the CHI allows for stratified application of dentin, enamel, and opalescent incisal composite masses, offering enhanced control over esthetic layering and morphology. This results in superior esthetic integration compared to the conventional technique, while maintaining the reproducibility and predictability of IMT.

Conclusions: the introduction of the Customized Hybrid Index represents a significant advancement in the Injection Molding Technique. It allows for a more refined esthetic outcome and greater versatility in composite material use. Part 1 of this article outlines the operative protocol, while part 2 will address the clinical indications and broader applications of this technique.

FROM DIGITAL DESIGN TO MOCK-UP: A WORKFLOW FOR ESTHETIC SMILE REHABILITATION

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Aim: to present a clinical workflow that integrates digital smile design with mock-up fabrication for the aesthetic and functional rehabilitation of anterior teeth. The objective is to enhance diagnostic predictability, interdisciplinary communication, and patient involvement in treatment planning.

Methods: a patient with compromised esthetics in the anterior region underwent a full digital workflow, beginning with photographic documentation and intraoral scanning. The data were processed using smile design software to create a digital wax-up, which was evaluated in terms of facial harmony, tooth proportions, and gingival architecture. A 3D-printed model was then used to fabricate a diagnostic mock-up, enabling both clinician and patient to preview the proposed changes intraorally. Final restorations were realized following mock-up approval, ensuring minimal invasiveness and predictable outcomes.

Results: the proposed digital workflow facilitated precise esthetic planning and real-time visualization of treatment outcomes. The mock-up phase proved essential for assessing the functional and esthetic impact of the restorations, allowing for minor adjustments prior to finalization. The patient showed high satisfaction with the results, and the clinical team reported improved interdisciplinary coordination.

Conclusions: digital smile design, combined with mock-up evaluation, provides a reliable, patient-centered approach for anterior esthetic rehabilitation. This method supports conservative treatment planning, enhances communication, and improves patient acceptance and outcome predictability.

ADHESIVE CEMENTATION OF INDIRECT POSTERIOR RESTORATIONS: RETROSPECTIVE ANALYSIS

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Aim: the aim of this study was to retrospectively evaluate the clinical outcomes of adhesive cementation protocols for indirect posterior restorations, with a focus on material selection, marginal adaptation, and failure rates.

Methods: a retrospective analysis was conducted on 34 indirect restorations placed in posterior teeth of 12 patients between 2019 and 2024. The indirect restoration was all onlay. All restorations were fabricated from lithium disilicate and cemented under rubber dam isolation using adhesive techniques. Evaluated parameters included marginal integrity, restoration survival, debonding, chipping, and postoperative sensitivity. Clinical records and follow-up photographs were reviewed up to 48 months.

Results: after a mean follow-up of 27 months, the overall survival rate was 97.1%. One onlay showed marginal chipping at 18 months, which was resolved with a direct composite repair. No cases of debonding or secondary caries were observed.

Conclusions: adhesive cementation of indirect restorations in posterior teeth demonstrated excellent clinical performance, confirming the importance of material selection, proper isolation, and adhesion protocol.

A MICRO-CT EVALUATION OF MARGINAL AND INTERNAL FIT OF LITHIUM DISILICATE CROWNS WITH CHAMFER AND EDGE-LESS PREPARATION, AND FABRICATED WITH CAD/CAM AND TRADITIONAL TECHNIQUES

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Aim: this study investigates marginal and internal precision of lithium disilicate crowns, considering some variables such as type of preparation and manufacturing techniques. The crowns are fabricated using the heat-press technique, subtractive CAD-CAM, and additive CAD-CAM. Both chamfer and edge-less preparations are investigated in this study.

Methods: two extracted maxillary third molars were prepared, one with edge-less preparation and the other with chamfer preparation. Impressions were taken using PolyVinylSiloxane (PVS) and an intraoral scanner. The PVS impressions of both abutments were poured into plaster models, and lithium disilicate crowns were fabricated with the heat-press technique. The intraoral scans were used to fabricate two milled crowns and two printed crowns, one for each type of preparation. Micro-CT scans were performed to measure the marginal and internal fit.

Results: analog crowns show the best overall precision, followed by milled crowns that still provide acceptable precision. 3D-printed crowns, despite achieving clinically acceptable results, were less accurate than heat-pressed and milled crowns. Edge-less preparation crowns show better marginal and internal precision than chamfer preparation crowns across all techniques.

Conclusions: the results of this study assess that edge-less preparation lithium disilicate crowns guarantee higher marginal and internal precision, regardless of the fabrication technique. Analog crowns remain the gold standard, but milled crowns are a reliable alternative. In contrast, 3D printing shows inferior accuracy.

MICRO-COMPUTED TOMOGRAPHY EVALUATION OF PARTIAL INDIRECT ADHESIVE RESTORATIONS: EFFECT OF PREPARATIONS AND TRADITIONAL OR ADDITIVE CAM WORKFLOW

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Aim: this study evaluates the marginal and internal fit of lithium disilicate overlays produced using traditional and additive digital workflow. It also investigates the effect of variables such as the type of tooth preparation and the type of 3D printer on the final restoration accuracy.

Methods: two extracted maxillary third molars were prepared with two different self-centering preparations. Impressions were taken using both traditional polyvinylsiloxane and digital intraoral scanners. Models were fabricated using traditional plaster and resin 3D printing methods. Lithium disilicate overlays were then fabricated using heat-pressed and 3D-printed methods. Two different 3D printers were used for these purposes. Micro-CT scans of the prepared teeth, models, and overlays were performed to assess the marginal and internal fit. Statistical analysis was conducted using one-way ANOVA.

Results: the results indicated that 3D-printed models were as accurate, or in some cases more accurate, than traditional plaster models. Regarding the marginal and internal fit of the overlays, 3D-printed restorations showed comparable accuracy to traditional heat-pressed ones. However, the type of tooth preparation and the type of 3D printer influenced the marginal precision of the restorations.

Conclusions: this study demonstrates that 3D printing is an efficient alternative to traditional methods for producing indirect restorations in clinical practice. The choice of 3D printer and type of preparation significantly impact the precision of overlays.

MICROSCOPIC ANALYSIS OF CEMENTATION MATERIAL BEHAVIOR ON MARGINAL GAPS

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Aim: this study aims to evaluate the influence of the cementation material on marginal gaps of lithium disilicate overlays. Following an analysis in another study, some inlays resulted inaccurate in certain marginal areas but were still cemented to observe the behavior of the cementation material at the gap level.

Methods: table-top preparation was performed on 8 extracted teeth. Before cementation, a micro-CT scan was conducted to measure each overlay's marginal and internal accuracy. Subsequently, 4 overlays were cemented using resin cement with the "tear-off" technique, while the remaining 4 were cemented with heated composite. Finally, the cemented overlays were analyzed using stereomicroscopy to observe the cementation line and check for marginal discrepancies.

Results: the study showed that resin cement caused marginal indentation at points where the overlays presented marginal gaps, but this phenomenon did not occur using heated composite. In contrast, no visible differences emerged between the two techniques for the marginally accurate areas.

Conclusions: even considering the limited sample availability, the results show that heated composite used as cementation material creates a smooth surface even in more significant gap areas. In contrast, resin cement used with the "tear-off" technique produces indentations in those areas.

IN VITRO COMPARISON OF THE MECHANICAL PROPERTIES OF ONLY AND METAL-REINFORCED PMMA: NEW PERSPECTIVES FOR IMMEDIATE LOADING

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Aim: this *in vitro* comparative study was performed with the aim of validating "ONLY", a new composite polymer, designed to overcome the mechanical limitations of metal-reinforced Poly(Methyl Methacrylate) (PMMA) interim restorations.

Methods: ten interim restorations were fabricated (five through ONLY composite and five through metal-reinforced PMMA) and screwed into prototype models simulating a fully edentulous mandible rehabilitated with six implants. Mechanical performance was evaluated through static compression (break point [N] and displacement [mm]) and dynamic cyclic tests (fatigue test). A total of 20 samples were analyzed (10 for static and 10 for dynamic).

Results: all of the specimens completed testing as planned, with no statistically significant differences between groups. The break point was 1953.19±543.73 N in the ONLY group and 2031.10±716.68 N in the PMMA group (p = 0.775). Displacement was 1.89±0.34 mm in the ONLY group and 1.98±0.75 mm in the PMMA group (p = 0.763). In the fatigue test, mean load was 3382.00±578.50 N in the ONLY group and 2504.60±972.15 N in the PMMA group, with a difference of 877.40±579.30 N (p = 0.121).

Conclusions: within the limitations of this study, "ONLY" shows potential for the immediate loading of dental implants, however further clinical research is required to confirm these findings.

EVALUATING FAILURE OF DENTAL CROWNS ON ENDODONTICALLY TREATED TEETH: FACTORS AND CLINICAL OUTCOMES

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Aim: this study reviews the factors influencing the success and failure of dental crowns on endodontically treated teeth, focusing on endodontic treatment quality, crown material, restorative techniques, and clinical management.

Methods: a systematic review analyzed 39 studies published between 1991 and 2023 from PubMed, Cochrane Library, Scopus, and Web of Science. Inclusion criteria targeted clinical trials and observational studies on crown failure and success. Data extraction covered study characteristics, crown materials, and failure types.

Results: several factors influence crown success. High-quality endodontic treatment reduces failure risk. The ferrule effect and core build-up enhance retention. Crown material impacts durability: zirconia provides strength, while all-ceramic crowns offer better aesthetics but higher fracture risk. Adhesive bonding improves stability. Mechanical failures (fractures, debonding) were more frequent than biological ones (secondary caries, pulp re-infection). Overall success rates exceeded 90% in many studies.

Conclusions: crown longevity on endodontically treated teeth depends on multiple factors. Optimizing endodontic treatment, material selection, restorative techniques, and clinical follow-up is essential. Further research is needed to standardize success criteria and improve protocols.

CHAIRSIDE PROTOCOL FOR AESTHETIC PROSTHETIC RESTORATION *VS* TRADITIONAL PROTOCOL

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Aim: the aim of this study is to compare the effectiveness of the chairside protocol for aesthetic prosthetic restoration with the traditional protocol, analyzing various factors such as execution time, aesthetic quality, and patient satisfaction.
Methods: a systematic review of the literature was conducted, examining comparative studies between the chairside and traditional protocols for aesthetic prosthetic restoration. The selection criteria included studies reporting data on treatment time, aesthetic outcomes, and patient satisfaction, analyzed using appropriate statistical methods.
Results: the chairside protocol seems to reduce the treatment time and increased patient satisfaction.
Aesthetically, no significant differences were found, although the traditional protocol showed slightly greater precision in the final stages.
Conclusions: the chairside protocol offers advantages in terms of treatment time and patient satisfaction, proving to be a valid alternative to the traditional protocol without compromising aesthetic quality.

SINGLE DENTAL IMPLANT RESTORATION: CEMENTED OR SCREW-RETAINED? A SYSTEMATIC REVIEW OF MULTI-FACTOR RANDOMIZED CLINICAL TRIALS

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Aim: this systematic review aims to compare the clinical, technical, and biological outcomes of cemented *versus* screw-retained single dental implant restorations.
Methods: this review included human and *in vitro* studies that focused on the keywords "cemented *vs* screw-retained" and "dental implant". A total of eight studies met the inclusion criteria, assessing a range of parameters such as implant survival rate, Bleeding on Probing (BOP), probing depth, plaque index, Marginal Bone Loss (MBL), cytokine concentrations, mechanical complications, esthetic outcomes, patient satisfaction, treatment time, and technical failures.
Results: the analysis revealed no significant statistical differences between cemented and screw-retained implants in terms of the primary outcomes, BOP and MBL (p-values for MBL and BOP were 0.5813 and 0.8093, respectively). Both types of restoration demonstrated comparable clinical, technical, and biological outcomes.
However, screw-retained restorations were associated with advantages such as retrievability, ease of repair, and predictable passive fit, while cemented restorations were noted for superior esthetics.
Conclusions: both screw-retained and cemented dental implant restorations offer similar outcomes across clinical, technical, and biological parameters. Screw-retained restorations provide benefits like retrievability and ease of repair, while cemented restorations excel in esthetics. The risk of peri-implant complications, especially due to residual cement in cemented restorations, must be considered.

STATE-OF-THE-ART DEEP LEARNING DRIVEN PROSTHETIC REHABILITATION: CONTEMPORARY INSIGHTS FOR PATIENTS WITH DISABILITIES

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Aim: deep learning is a subset of artificial intelligence that focuses on algorithms and models inspired by the structure and functioning of the human brain, known as artificial neural networks. Furthermore, this system provides reliable information, enhancing diagnostic and therapeutic processes. Artificial Intelligence (AI) is rapidly evolving in different fields, assisting humans in solving complex problems arising in our highly connected world. Among the well-established sectors where AI is making significant strides, this study will specifically examine the effectiveness of deep learning and AI in the healthcare field. The core focus of this analysis will be its application in dentistry, particularly for patients with limited cooperation. The aim is to facilitate the planning and execution of prosthetic treatments with greater speed and precision, optimizing operational times, which are often prolonged and complicated for uncooperative patients.

Methods: by leveraging the latest technologies, an analysis of radiographic images, computed tomography frames, and other diagnostic scans is performed. Through patient- acquired data, all necessary criteria are identified to enable diagnosis, treatment planning, and efficient data management.

Results: this system allows for the creation of rich and accurate datasets, leading to the development of models tailored to patients with specific needs.

Conclusions: the effectiveness of this technology can be achieved through the quality and quantity of collected data, standardization of diagnostic procedures, and validation of the models.

PROTOCOL DESIGN FOR IMMEDIATE *VERSUS* CONVENTIONAL LOADING IN SHORT AND ULTRA-SHORT IMPLANTS

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Aim: after tooth extraction, the resorption of the post-extraction socket is an unavoidable process. Although immediate implant placement helps maintain some bone structure, it does not completely preserve the integrity of the socket. Various preservation techniques have been developed, but none can entirely prevent alveolar bone resorption. In cases of severe bone atrophy, augmentation procedures are often required to ensure successful implant rehabilitation. This study aims to evaluate the immediate loading of short implants as a viable alternative to bone augmentation.

Methods: this research is structured as a randomized controlled clinical trial. Implant planning will involve the use of periapical intraoral radiographs and Cone Beam Computed Tomography (CBCT). Participants will receive titanium-zirconia implants with diameters of either 4.1 mm or 4.8 mm and lengths of 4 mm or 6 mm.

Results: the projected outcomes suggest that the immediate loading of short implants could result in similar or even reduced bone loss, fewer biological and prosthetic complications, and comparable or enhanced survival rates when compared to conventional loading. Additionally, patient satisfaction is expected to be higher.

Conclusions: short implants show survival rates comparable to those of conventional-length implants, with similar or even fewer biological and prosthetic complications and less bone loss. Immediate loading produces results that are as satisfactory as conventional loading, with similar biological and prosthetic challenges, though it is often influenced by poor oral hygiene. Bone loss is generally reduced, and patient satisfaction tends to be higher.

CASE STUDY: IMPLANT-PROSTHETIC REHABILITATION IN A MAXILLA RECONSTRUCTED WITH A FIBULA FLAP

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Aim: this case describes a patient who underwent hemimaxillectomy for a calcifying odontogenic tumor of Pindborg, followed by reconstruction with a free fibular flap and implant placement. The goal was to restore masticatory and phonatory function, as well as aesthetics, through a cemented implant-supported prosthetics.
Methods: after maxillary reconstruction, three BNX EVO implants (4 mm diameter, 10/11.5 mm lengths) were placed with submerged healing. A fibro-mucosal graft from the left hemipalate improved the peri-implant tissue profile. After osteointegration a PMMA provisional was placed, the final titanium-composite prostethics was fabricated and first cemented with TempBond, then permanently with Panavia.
Results: the implants achieved full osteointegration with clinical stability and no complications, except for mesial implant exposure. The fibro-mucosal graft improved peri-implant tissue adaptation, reducing gingival recession risk. The PMMA provisional helped assess occlusal function before final prosthesis placement, ensuring optimal force distribution. The patient reported improved masticatory and phonatory function, a satisfactory aesthetic outcome and high prosthetic comfort.
Conclusions: the success of rehabilitation in a maxilla reconstructed with a free fibular flap depends on careful implant-prosthetic planning and soft tissue management. The titanium-composite prosthesis ensured strength, lightness and biocompatibility, while temporary cementation allowed stability testing before final fixation.

A MINIMALLY INVASIVE RESTORATIVE APPROACH TO DENTAL WEAR: VALIDATING THE INJECTION TECHNIQUE

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Aim: to evaluate the effectiveness of the Flow Injection Technique (FIT) in the rehabilitation of patients with dental wear and increased Occlusal Vertical Dimension (OVD).
Methods: clinical case with significant dental wear. The protocol includes: radiographic analysis with cephalometric and intraoral radiographs for skeletal and dental evaluation, intraoral and extraoral clinical examination with photographic documentation to assess dental surfaces and facial aesthetics, 3D facial scan, digital optical impressions with creation of digital models for 3D diagnostic wax-up and creation of a silicone mask for FIT, OVD determination with the “Vertical Box” technique using temporary rebalances on teeth 1.1, 2.1, and 4.1, limit of the increase 5 mm according to the literature.
Results: the following were evaluated: aesthetic analysis of the OVD increase in millimeters and of the reconstructions, functional analysis of phonetics, reduction of muscle tension, and improvement of Temporomandibular Joint (TMJ) disorders, subjective evaluation of patient satisfaction.
Conclusions: the Flow Injection Technique is effective and minimally invasive for the rehabilitation of worn arches and for a predictable OVD increase. The advantages show a reduction in sensitivity, high satisfaction, and excellent medium- to long-term durability of restorations, subject to proper management.

PROSTHODONTIC REHABILITATION IN A PATIENT WITH COCAINE-ABUSE PALATAL PERFORATION: A CASE REPORT

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Aim: this clinical report aims to highlight the complications associated with cocaine use, particularly focusing on oronasal perforations, and demonstrate the efficacy of using a maxillary obturator for rehabilitating palatal defects to improve patients' quality of life.

Methods: a 60-year-old male patient with a history of cocaine abuse presented with an oronasal perforation in the hard and soft palate. He reported issues with hypernasal speech and swallowing difficulties. A prosthodontics approach was employed; a removable obturator was fabricated using impression techniques with care to minimize weight and maximize functionality.

Results: post-delivery, the obturator successfully restored the patient's ability to speak and swallow normally, with significant improvements reported in aesthetic outcomes. Regular follow-ups demonstrated the prosthesis's stability. Particularly, soft relining was utilized to accommodate changes in the oral cavity due to potential inflammation or tissue changes.

Conclusions: the findings suggest that prosthetic rehabilitation is a viable and effective solution for managing palatal perforations resulting from cocaine use, significantly improving oral functions and quality of life. This approach highlights the need for comprehensive treatment plans that include both prosthetic management and encouragement toward substance abstinence.

PROSTHODONTIC REHABILITATION OF AN ARAMANY CLASS III DEFECT CAUSE BY A RARE MYOEPITHELIAL CARCINOMA OF THE MINOR SALIVARY GLAND

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Aim: this clinical report aims to describe a prosthodontics rehabilitation of a maxillary defect associated with myoepithelial carcinoma of the minor salivary gland. Particularly, focusing on oronasal perforations, it demonstrates the efficacy of using a maxillary obturator for rehabilitating palatal defects to improve patients' quality of life.

Methods: a 32-year-old male patient with a history of multiple surgical interventions presented with an oronasal communication in the hard and soft palate. He reported issues with hypernasal speech and swallowing difficulties. A prosthodontics approach was employed; a metal framework obturator was fabricated using impression techniques with care to maximize comfort and functionality.

Results: post-delivery, the obturator successfully restored the patient's ability to speak and swallow normally, with significant improvements reported in the quality of life.

Regular follow-ups demonstrated the stability of the prosthesis, particularly after soft relining was utilized to accommodate changes in the shape of the defect and tissue changes.

Conclusions: the findings suggest that prosthetic rehabilitation with an obturator is a viable and effective solution for managing palatal defects in cancer patients, significantly improving oral functions and quality of life.

MULTIDISCIPLINARY RESOLUTION OF A CASE OF PARTIAL EDENTULISM AND LOSS OF VERTICAL DIMENSION

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Aim: in the Restorative/Endodontics and Prosthodontics Department at the University of Milan, patients frequently visit our clinic for prosthetic rehabilitation. This offers students the opportunity to manage complex multidisciplinary cases, enhancing their knowledge and applying advanced technologies.

Methods: after the initial oral examination, it was determined that extractions of two hopeless teeth (16 and 38) were necessary. Following the extractions, root canal therapy was performed on tooth 3.5, which presented significant decay. The prosthetic phase then began. The first step was to determine the correct vertical dimension, which we achieved through a temporary prosthesis (both fixed and removable). This also helped condition the masticatory muscles. We proceeded by taking intraoral scans of the prepared teeth, trying the metal substructure of the fixed prosthesis, and ordering the final fixed metal-ceramic prosthesis, along with the removable prosthesis. Meanwhile, the inferior incisors, damaged by bruxism, were restored using a minimally invasive aesthetic approach. Finally, we delivered the final prostheses and fabricated a custom-made bite to protect the teeth and reduce excessive stress on the masticatory muscles.

Results: through endodontic and restorative procedures, we were able to preserve the teeth that did not require indirect restoration. Additionally, the fixed and removable prostheses successfully restored the correct vertical dimension and occlusion for the patient, enabling comfortable mastication and balanced use of the masticatory muscles.

Conclusions: the multidisciplinary approach used in this case proved effective in addressing both the functional and aesthetic needs of the patient. The integration of advanced technologies played a vital role in ensuring high precision and optimal outcomes.

DIGITAL WORKFLOW FOR THE REALIZATION OF A VIRTUAL 4D PATIENT AND THE REHABILITATION OF THE VERTICAL DIMENSION WITH THE VERTICAL BOX TECHNIQUE

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Aim: the Vertical Box technique provides a simple, applicable, and monitorable approach to restoring correct inter-arch relationships and Vertical Dimension of Occlusion (VDO). This is achieved through the patient's neuromuscular proprioception using a fully digital therapeutic protocol.

Methods: a virtual 4D model of the patient was created using a digital impression from an intraoral scanner and facial scans. PMMA shells with standardized dimensions were then prescribed to the laboratory. After insertion, VDO was customized through aesthetic and phonetic tests, achieving a point contact with a Jig function. This facilitated neuromuscular deprogramming and three-dimensional mandibular repositioning. The patient's full virtualization was completed by recording individual mandibular dynamics with a dedicated scanner.

Results: this technique provides extensive data that allow the laboratory to create the Rebalance, a provisional device that integrates with the patient's function. The clinician can test and adjust the rehabilitation plan in a reversible way before proceeding with the final prosthesis.

Conclusions: the Vertical Box technique has proven to offer a predictable and repeatable protocol for VDO restoration. The fully digital workflow enables the design of customized prostheses that enhance both function and aesthetics.

1-YEAR CLINICAL OUTCOME OF A POSTERIOR INDIRECT RESTORATION USING 3D-PRINTED HYBRID COMPOSITE

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Aim: 3D printing is a digital innovation in dental restorations, offering an alternative to traditional subtractive CAD/CAM systems. Full indirect restorations made via 3D printing have shown promising results, both as provisional and definitive options. Recently, interest has grown in using the same technology for Indirect Partial Restorations (IPRs). Few 3D printers support composite IPRs, and one in particular allows "multi-color" printing, helping reproduce natural tooth shades. However, clinical data on 3D printed hybrid composite IPRs in outpatient settings remain limited. This clinical case aims to present a 3D printed onlay performed with a fully digital, single-visit workflow.

Methods: a 22-year-old female visited the Dental Clinic of the University of Bologna for a routine check-up. Clinical and radiographic evaluations revealed extensive decay on tooth 4.6 and an endo-perio lesion with grade 2 mobility. The treatment plan included endodontic therapy, composite build-up, and a 3D printed onlay using hybrid composite (Dfab printer, DWS Systems), cemented with universal resin composite cement (Panavia SA Universal).

Results: the one-visit treatment was well accepted; the patient was satisfied with both procedure and esthetics. At 1 year, mobility was reduced and lesion improvement noted.

Conclusions: though still not widely used, in-office 3D printing shows strong potential for IPRs, requiring clinician expertise in digital workflows and effective patient communication.

THE 3D PRINTED INDEX TECHNIQUE IN THE MANAGEMENT OF WORN DENTITION: A NO-PREP, DIGITALLY-GUIDED RESTORATIVE WORKFLOW

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Aim: this case report aims to describe a fully digital, no-prep full-mouth restorative approach for the management of worn dentition using a 3D-printed transparent index.

Methods: a 52-year-old male patient presented to the Dental Clinic of the University of Bologna with generalized severe dental wear, sensitivity to thermal and acidic stimuli, and dissatisfaction with smile esthetics. After clinical and radiographic examination, photos, videos, and digital intraoral scans (TRIOS 5) were obtained. Due to financial limitations, a minimally invasive, cost-effective treatment was selected. A digital full-mouth wax-up was created by the dental technician, followed by the fabrication of a 3D-printed transparent index (Formlabs). A mock-up trial was performed to validate esthetics and function. Under rubber dam isolation, the teeth were alternatively covered with PTFE tape, sandblasted with 50 µm alumina, etched with 37% phosphoric acid, and treated with universal adhesive (Universal Bond Quick 2). A highly-filled flowable resin (CLEARFIL MAJESTY™ ES Flow – Low, A1) was injected through the seated index and light-cured for 20 s. Finishing was performed with Twist Dia polishers (Kuraray), and final polishing was completed one week later.

Results: at the 3-month follow-up, all restorations remained intact, with no sensitivity, chipping, or periodontal issues. The patient reported full satisfaction.

Conclusions: the described 3D printed index technique offers a predictable, efficient, and cost-effective restorative solution for the management of worn dentition.

CONVENTIONAL *VERSUS* DIGITAL IMPRESSION TECHNIQUE: TIME, COMFORT AND PATIENT PREFERENCES COMPARED

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Aim: prosthetic rehabilitation, whether implant-supported, natural teeth, must ensure adequate function and aesthetics. This overview aims to evaluate the accuracy, turnaround time, and patient preference in the use of digital impressions versus conventional high-precision impressions.

Methods: the review was conducted following the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines. Study selection was based on the Population-Exposure-Outcome (PEO) model, a variant of the PICO model.

Reviews on digital dental impression technique with intraoral scanner *versus* analog technique with high-precision materials were systematically searched. The search, conducted, included English-language articles from several databases and registries, including PROSPERO, Scopus, MEDLINE/PubMed, BioMed Central, and Cochrane Library. From the 2,942 articles initially identified, only 23 systematic reviews were included in the analysis. Accuracy, run time, and patient preference for fingerprints were compared with those of conventional techniques used for analog flow.

Results: the results show mixed data on the accuracy of the two methods. One limitation is the variability of the digital scanners used in the different *in vivo* studies and the differences in the number of missing teeth or implants.

Conclusions: more *in vivo* clinical studies and RCTs are needed to increase the level of evidence for impression procedures.

DIFFERENT TECHNIQUES OF POST-EXTRACTIVE TOTAL PROSTHETIC REHABILITATION IN CANCER PATIENTS: A CASE SERIES

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Aim: conventional complete dentures are sometimes the only possible solution for the rehabilitation of terminal dentitions in patients with compromised health conditions, such as systemic oncological diseases. Rehabilitation using conventional complete dentures in the immediate post-extraction (ID) modality is a fast and cost-effective treatment that provides patients with an acceptable aesthetic and functional restoration. Various fabrication techniques exist, including the “Conventional” (CID) and the “Interim” (IID) methods, such as the “Jiffy technique”.

Methods: several rehabilitations with immediate post-extraction dentures (ID) performed at the Dental School of Turin were analyzed to highlight differences, advantages, and disadvantages of the different rehabilitation types. Various aspects were considered, including the patient's initial condition, clinical steps, prosthesis fabrication processes, and patient acceptance.

Results: immediate dentures play a crucial role in the treatment of oncological patients, offering aesthetics, functionality, and psychological support after extractions and during the healing phase.

Conclusions: this technique is more complex than the fabrication of a conventional complete denture and highly operator-dependent. However, if the patient is adequately prepared and the most appropriate technique is selected, the outcome can be successful.