Copy Paste Approach: the digital critical interface

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Purpose: A key aspect of the prosthetic workflow on natural teeth is the appropriate management of soft tissues around provisional restorations and the predictable transfer of such information. Today technologies allow a complete digitalization of our patients improving our capacity to plan, present and perform complex rehabilitation thanks to digital scanners, CAD softwares, 3D printers and metal free restorations. The aim of this research is to present a reliable and repeatable protocol to copy paste the emergence profile in fixed prosthodontics on natural abutments by means of a full digital workflow.

Material and methods: the so-called "Copy-Paste Approach" is hereby presented through a case presentation. The workflow includes different steps: 1) Acquisition of initial clinical data through digital photography, scans and x-rays to formulate a diagnosis; 2) Smile simulation to emotionally engage the patient and propose the treatment plan; 3) Teeth preparation with featheredge finishing lines 4) PMMA milled provisional relined and refined; 5) Digital scans of the provisional restoration in position, opposing arch, bite registration and abutments, with the double cord technique; 6) Provisional restoration chairside scan 7) Framework try-in 8) Final restoration with occlusal monolithic zirconia and stratified with ceramic in the vestibular aspects.

Results: An ASA-1 female patient came to our attention seeking for an improvement of esthetics of her anterior upper old metal-ceramic restorations, which had altered proportions.
The x-rays showed the presence of four metal posts and inadequate canal therapies. A Digital Simulation of the ideal design helped to communicate with the patient and the multidisciplinary team. The proposed treatment plan included endodontic re-treatments of the upper incisors and their rehabilitation with metal free crowns. The natural abutments were prepared, through the mock up, with featheredge finishing lines and then restored with a relined and refined PMMA milled provisional consistent with the initial digital wax-up.
This step is fundamental in order to test occlusion and esthetics of the final restorations. After 2 months, the Scan Strategy utilized for the Digital Impression was: scan of the provisional restoration in situ; scan of the opposing arch; scan of the bite; high definition scan of each single abutment with the double cord technique; chair-side scan of the provisionals.
All the files were imported into the 3D CAD Software in order to design the final restoration. In this step the technology allowed the technician to copy and paste the provisional's emergence profile position and occlusion tested into the patient's mouth, thus eliminating the need for arbitrarily establish it.

Conclusions: the proposed protocol fulfilled the desired objectives and the digitalization was a key element in every step of the workflow. Thanks to this approach the final prosthetic emergence profile perfectly matched the soft tissues adaptation to the provisional's margins. Nonetheless, it is obvious that in order to achieve an optimal esthetic outcome and a long-term success the clinician needs to master all the analogue milestones of prosthodontics such as position and accuracy of the prosthetic margin, properties and manufacturing of dental materials, emergence profile and patient compliance. If the above mentioned concepts are fulfilled, digital innovations will lead to a better final results in terms of efficiency, standardization and quality. In conclusion, the evolution of dental technologies gives the possibility to test every step and replicate what is achieved, simplifying every clinical procedure and offering a better experience to any patient.

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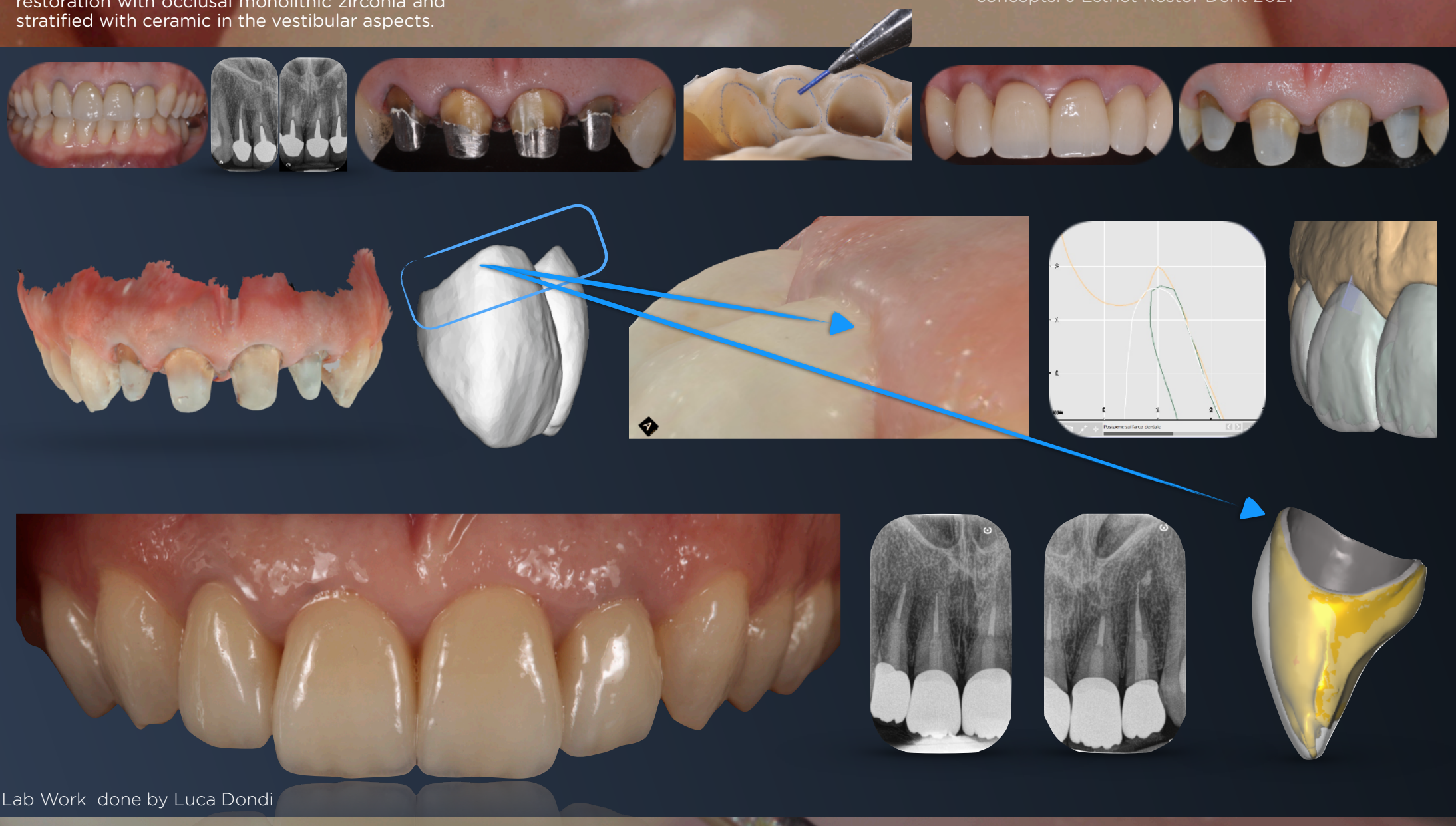
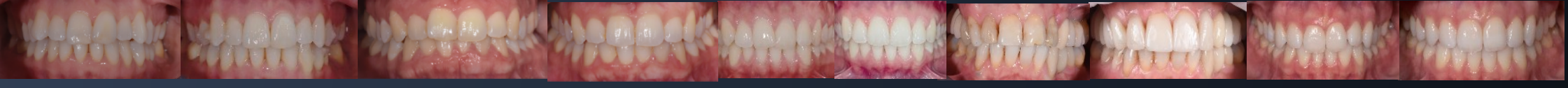


Lab Work done by Luca Dondi

The Goal is to Copy and Predictably Replicate the Tested Provisional Restoration Emergence Profile

Data Acquisition → DSD Smile Simulation → Case Acceptance → Teeth Preparation → PMMA Provisional Relined → Soft Tissue Healing → IOS Clinical Situation Impression → Chairside Provisional Restoration → Copy Paste Dentistry at the CAD Software → Cad Cam Workflow → Final Restoration



SIPRO
Società Italiana di Protesi Dentaria e Riabilitazione Orale

DSD
Digital Smile Design

Digital Analysis to evaluate the reliability between **ClinCheck®** and final clinical result with **Invisalign Go®**: a multi center retrospective study

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STUDIOAGNINI SMILE BOUTIQUE

Purpose: Clear aligner therapy is nowadays a well-established technique to align teeth. Recently, Align Technology has introduced a new product specifically designed for general practitioner in order to align teeth in the esthetic area called Invisalign® Go and Go Plus. While clear aligners are an ideal solution in terms of aesthetics, comfort and hygiene, there is no general consent on the predictability of the movements planned within the initial digital setup. The aim of this retrospective multi-center study is to compare the digital planning of dental movements of 20 Clinical Cases, diagnosed, planned and treated in a completely digital environment, with the final clinical result obtained.

Material and methods: the sample of this retrospective study consisted of 20 patients (9-male, 11-female), mean age 32.7 years, treated with Invisalign® Go (from 5 to 5) and Go Plus (from 6 to 6) systems (Align Technology Inc., Tempe, AZ, USA) in two different dental clinics (10 patients each). The inclusion criteria were: 1) ASA-1 or ASA-2 classification; 2) aged > 18 years; 3) just a single set of aligners (no additional aligners) used to complete the treatment. Exclusion criteria were 1) patients required additional set of aligners to complete the treatment; 2) patients not compliant to wear aligners the required amount of time. All the impressions were made with digital intraoral scanner (iTero® Align Technology Inc., Tempe, AZ, USA). ClinCheck® 3D controls together with comments exchange with technicians were used in every case to modify and improve the proposed ClinCheck® by Align. Aligners were changed every 7-14 days; checkup visits were booked every 4 aligners. The .STL file of the final planned position was exported by ClinCheck® software and superimposed with the .STL file of the final clinical position taken with an iTero digital scan at the end of the treatment. Files were uploaded into a three-dimensional digital parametric inspection software (GOM Inspect 2019, Braunschweig, Germany). Second molars (never involved in the treatment) were used as references to perform superimposition between digital models. When missing, first molars were used (only Invisalign Go cases). Single deviation of the superimposed teeth was measured (threshold ± 0.5mm) to evaluate how reliable the system was. An exemplary case is hereby presented.

Results: Twenty patients were included. 14 of them were treated in both arches, 6 only single arch was treated. Invisalign Go cases were 14 Invisalign Go Plus cases were 6. Mean deviation were calculated on patient basis and the result was 0.1373. On single arch basis (total of 34) the result was 0.1371

Conclusions: Invisalign Go proved to be a predictable and efficient system to solve mild to moderate malocclusions in a completely digital environment. To date, at the best of our knowledge, there are no studies comparing iGo and iGo Plus ClinCheck® setup and the real clinical result. Thanks to the mean deviation recorded we can assume that this value could ensure an acceptable predictability. Technology plays a pivotal role in the predictability of the whole treatment plan. It allows to enhance precision during all the steps, beginning from the intraoral scanning phase to the printing of the aligners. In addition, proprietary softwares such as TimeLapse and Invisalign Progress Assessment were useful to quality control the cases during the follow up appointments and to motivate patients, which collaboration proved to be fundamental to solve the malocclusion. For these reasons Invisalign Go could be considered an optimal solution to be used as well for preprosthetic purposes, in order to reduce teeth preparation, to optimize the aesthetics and to enhance the efficiency and predictability of the final restorations on a long term.

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The Goal is to determine the Consistency of the iGo ClinCheck simulation (digitally & facially driven) with the final clinical result

STUDY WORKFLOW

	Total	Mean Deviation
Casi Go	14	
Casi Go Plus	6	
Totale arcate	34	0.1371
Totale pazienti	20	0.1373