THE AESTHETIC REHABILITATION OF ANTERIOR TEETH USING ALL-CERAMIC RESTORATIONS – CLINICAL CASES
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Abstract: The morpho-functional rehabilitation is a fundamental principle in any prosthodontic therapy. The all-ceramic fixed restorations offer the best aesthetic results due to the absence of the metal coping. Differences among all-ceramic systems concern issues like technique, resistance and translucency. The mechanical properties of these restorations are enhanced and their susceptibility to fracture is reduced by use of the resin-bonded technique. The complete ceramic crown’s major indication concerns the anterior maxillary teeth of most patients, except those with oral parafunctions or deep overbites. The dental preparation is slightly more conservative than that of the metal-ceramic crown, although crown thickness becomes an issue that can influence the crown’s resistance. Purpose: In most cases, the purpose is the aesthetic rehabilitation of severely damaged anterior maxillary teeth. Materials and method: The article presents several clinical situations that require prosthodontic treatment for the restoration of anterior teeth. The therapeutical solutions have been elaborated to gain the maximum advantage for the patient according to the biopsychological and social context, thus proving the method’s feasibility and excellent clinical results. The study was conducted on 16 patients, of different sex, age and profession, in the Dental Prosthetics Clinic. The materials used were IPS e.max Press ceramic (lithium disilicate glass-ceramic) and PermaCem dual-cured luting cement. Results: Remarkable aesthetic and functional results have been obtained for the anterior maxillary area thus satisfying the most pretentious of patients. The chosen therapeutical plans, using the mentioned materials, have brought harmony to the soft and hard tissues. Conclusions: For a prosthodontic treatment to be successful, it requires a thorough clinical and paraclinical examination of the patient, specific interventions on the bone, gums, teeth and periodontium and a good doctor-patient-dental technician collaboration.

Key words: aesthetics, all-ceramic crown, fixed prosthodontics

INTRODUCTION
The morpho-functional rehabilitation is a fundamental principle in any prosthodontic therapy. The all-ceramic fixed restorations offer the best aesthetic results due to the absence of the metal coping. Differences among all-ceramic systems concern issues like technique, resistance and translucency. The mechanical properties of these restorations are enhanced and their susceptibility to fracture is reduced by use of the resin-bonded technique. The complete ceramic crown’s major indication concerns the anterior maxillary teeth of most patients, except those with oral parafunctions or deep overbites. The dental preparation is slightly more conservative than that of the metal-ceramic crown, although crown thickness becomes an issue that can influence the crown’s resistance.

The continuous technological progress of the all-ceramic systems has encouraged the development of numerous fixed prosthodontic rehabilitation techniques, concerning the anterior maxillary teeth. Long term success of the prosthodontic treatment depends largely on doctor-patient communication and the patient’s understanding of the limitations of the prosthodontic treatment, but also on interdisciplinary collaboration. Communication can be enhanced by a thorough clinical examination, allowing a correct diagnostic and a thought-out treatment plan for the correction of the aesthetic problems.

MATERIALS AND METHOD
The article presents several difficult clinical situations that require the aesthetic rehabilitation of the maxillary anterior teeth. The therapeutical solutions have...
been elaborated to gain the maximum advantage for the patient according to the bio-psychological and social context, thus proving the method’s feasibility and excellent clinical results. The study was conducted on 16 patients, of different sex, age and profession, in the Dental Prosthetics Clinic, Dental Medicine College, “Ovidius” University of Constanta.

The following materials were used: IPS e.max Press lithium disilicate glass-ceramic for the press technique, PermaCem dual-cure luting cement, alginate (Ypeen), Dentalon (for temporary restorations), Temp Bond (non-eugenol temporary cement), impregnated retraction cord (ROEKO), condensation silicone Zeta Flow (putty and fluid Elite HD).

The major issues were:
- treatment of the odontal lesions and crown restoration
- establishing the correct shape and location on the incisal margin of the central incisors using temporary restorations and finishing the incisal margin
- insuring a dominant position for the central incisors while respecting the position of the lateral incisors, for a harmonious frontal guidance
- endodontic and periodontal evaluation
- selecting the all-ceramic system according to the expected aesthetic performances
- correct registration of the shade for the future all-ceramic restorations

The tooth preparations have been accomplished with the correct length, width, taper, resistance form and marginal design, with the ultimate purpose of creating long-lasting aesthetic restorations. The vestibular and oral reduction has provided a 1.3 mm of clearance on each surface in order to insure an acceptable thickness of the crown for better resistance and excellent aesthetics. The taper of the preparation should be of 8-10 degrees and it is accomplished for better resistance and maximum preservation of tooth structure. The oral surface is finished, with respect to its morphology. The gingival finish line was prepared as a shoulder or a chamfer for good marginal closure and better aesthetics. The incisal line angles were rounded. The vestibular reduction provided a clearance of 1.3-1.4 mm, to allow the transmission of light through the ceramic layer. For biomechanical reasons, great care was taken to insure that the preparations are perfectly parallel. Temporary restorations are helpful because their breadth can be measured and used to estimate the breadth of the future all-ceramic crown. In order to obtain an acceptable impression, the gingival finish line was registered with the help of a double retraction cord. For biomechanical, aesthetic and biological reasons, the trial of the ceramic coping is an essential stage; this is also the stage when the space for the interdental papilla is verified. The all-ceramic restorations were cemented using a resin-bonding cement.

**Clinical case nr. 1:**

20 year-old female patient presents herself at the Dental Prosthetics Clinic for aesthetic rehabilitation of the maxillary anterior teeth that were severely damaged by dental caries. The prosthodontic solution: all-ceramic restorations (fig. 1, 2, 3, 4).
Clinical case nr. 2:

32 year-old female patient presents herself at the Dental Prosthetics Clinic for the aesthetic and functional rehabilitation of the maxillary teeth. After a careful clinical and paraclinical examination, the diagnostic is set: simple and complicated odontal lesions on the maxillary incisor group, class III Kennedy edentation with one modification. The prostodontic treatment plan implies restoring the central and lateral incisors (1.2, 1.1, 2.1, 2.2) using all-ceramic crowns (IPS e.max Press ceramic) and fixed partial metalo-ceramic restorations for the lateral areas (1.3, 1.4, 1.5, 1.6, 1.7 and respectively 2.3, 2.4, 2.5, 2.6, 2.7)—fig. 5, 6, 7.
Clinical case nr. 3:
22 year-old female student presents herself at the Dental Prosthetics Clinic with preparations on the superior central incisors (1.1, 1.2) and right lateral incisor (1.2); the preparations were made in a different dental clinic. The prosthodontic treatment implies restoring the prepared teeth using all-ceramic crowns (IPS e.max Press ceramic) – fig. 8, 9.

![Initial clinical aspect](image8)
![Final clinical aspect](image9)

Clinical case nr. 4:
36 year-old female patient presents herself at the Dental Prosthetics Clinic wishing to improve her aesthetics. Prosthodontic treatment: the restoration of the superior central and lateral incisors and canines using all-ceramic crowns (IPS e.max Press ceramic) and the restorations of the superior and inferior premolars and molars using metal-ceramic crowns (fig. 10, 11).

![Initial clinical aspect](image10)
![Final clinical aspect](image11)

Clinical case nr. 5:
28 year-old female patient presents herself at the Dental Prosthetics Clinic wishing to aesthetically restore her incisors. The prosthodontic treatment implies the restoration of the superior central and lateral incisors using all-ceramic crowns (IPS e.max Press ceramic) – fig. 12, 13.

![Initial clinical aspect](image12)
![Final clinical aspect](image13)
RESULTS
Careful manufacturing of the all-ceramic prosthetic elements, along with the use of a resin-bonding cement have contributed to the successful restoration of damaged teeth with exceptional aesthetic results.

DISCUSSIONS
Although the metal-ceramic restorations can be used in most clinical situations, especially in the posterior area, where a greater stress resistance is required, these restorations produce less satisfying aesthetic results. The translucency of the metal-ceramic crowns is altered by the presence of the metallic coping, which blocks light transmission through the restoration. Because of this reason, the all-ceramic crowns set a new standard in aesthetic restorations, difficult to achieve by metal-ceramic crowns.

An assessment of the patient’s expectations and understanding of the possible therapeutic solutions is crucial before commencing any treatment plan.

Obtaining the phonetic, dento-labial and facial parameters by observing the lip movement in relation to the teeth, although only a stage in a more complex series of procedures, constitutes a good starting point for an optimum aesthetic rehabilitation, providing the necessary information to allow the clinician to make the right therapeutic choice in every clinical case.

The careful assessment of all the clinical parameters, from a practical and rational point of view, allows the clinician to improve the quality level of his work, manufacturing restorations that are integrated not only in the oral cavity but in the patient’s physiognomy.

CONCLUSIONS
This article presents 5 different clinical cases that share the diagnostic: severe damage to the maxillary frontal teeth, with major negative implications concerning the dento-facial aesthetics.

The all-ceramic restorations were the best choice for aesthetic rehabilitation.

All-ceramic crowns represent a great progress in dental aesthetics.

The complex and modern clinical and technical procedures, along with the increasing aesthetic expectations of the patients can only be satisfied through a perfect doctor-patient-technician collaboration.

REFERENCES


