

## Aesthetic Enhancement with All-Ceramic Bridge Replacing A Metal Ceramic Prosthesis For A Young Female Patient: A Case Report

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**Abstract:** *Improper designing and selection of the restorative materials in the aesthetic zone resulted in patient unsatisfactory. The purpose of this case was to create an aesthetic, attractive, natural and hygienic restoration for a young female patient. A zircon bridge was fabricated to replace a non-clinically acceptable metal ceramic bridge for a 25-year-old female patient who attended to the specialty clinic. The aesthetic design and treatment with all-ceramic CAD/CAM bridge resulted in an improved of facial aesthetics, creating symmetry of central incisors and enhance the social life of the patient.*

**Keywords:** *non-rigid connectors, pier abutment, bleaching, aesthetic*

**Running Title;** *replacement of metal ceramic bridge by all-ceramic for a female patient*

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### I. Introduction

The aesthetic retreatment of anterior teeth has always presented a challenge in clinical practice. Restorative material such as zircon all-ceramic crowns and bridges has been chosen as an alternative to improve the oral condition and existing restoration (1). Anterior aesthetic rehabilitation with free metal-ceramic (MC) bridge improved the self-esteem, self-confidence of the patient and permitted her to return to a satisfactory social life (2). Hence, a combination of both dentist and ceramist must follow a certain protocol to achieve maximum clinical success and long-lasting restoration (3).

During the past decades, the recent restorative materials and new technologies in oral rehabilitation had improved the restorative dentistry field. They offer a variety of approaches to treat the difficult cases of symmetry, shape, position, proportion, alignment, surface texture and color of anterior teeth in our daily practices (4). All recent ceramic materials showed excellent physical, mechanical and biological clinical performances during last years. Aesthetic dentistry frequently means walking a tightrope between functional and aesthetic requirements (5). The patient requests for more aesthetic and biologically 'safe' materials that have led to an increased demand for all-ceramic restorations (6).

The following case presentation illustrates the use of CAD/CAM zircon restoration to replace an existing metal ceramic bridge in the aesthetic zone. The advantages of this replacement were to create a maintainable healthy periodontal environment, improve facial appearance and restore her symmetrical teeth back to normal size in harmony with the existing occlusion.

### II. Case Report

A 25-year-old female fashion designer patient attended to the specialty clinics. The patient requested to replace the existing maxillary metal ceramic anterior bridge. The patient was unhappy with her existing old MC bridge due to asymmetrical anterior central's teeth. She asked for more natural attractive smile appearance. Furthermore, she complained of the gray color of the metal at the gingival margin and expressed interest in improving his facial appearance. Intraoral examinations showed 3 unit MC bridge (Figure 1). Mild gingivitis in the interproximal and embrasure areas with gray pigmentation at the free gingiva of the teeth # 12,21 were obvious. No pain in the temporomandibular joint was detected. Class 1 molar relationship and canine guidance occlusion were observed. Radiographic examination showed a continuity of lamina dura around the abutment teeth (Figure 2).

After examination of the patient and data collecting, the steps of the treatment plan sequences and the replacement of the existing MC bridge were discussed with the patient, his agreement was taken. The treatment was begun by maxillary and mandibular impression with alginate dust-free impression materials. At this visit, scaling and polishing of teeth were done including the abutment teeth. From the poured impression models, diagnostic wax-up was prepared with the help of the dental technician, by CAD/ CAM machine (Figure 3). Then, rubber base indexes were prepared from the diagnostic models.

The removing of the MC bridge retainers was started with sectioning of the existing retainers on teeth # 12, 12 from buccal to lingual using coarse diamond burs (Meisinger, Germany) as recommended by Rosenstiel et al, 2006 (7). The sectioning was done without local anesthesia. The abutment teeth were vital, then local anesthesia was injected and modification of the preparations of the abutments to receive all ceramic retainer were done. Double

retraction cords were applied around the abutments (Figure 4). Then the maxillary impression was taken with addition Silicon (Virtual Ivoclar Vivadent, Lichtenstein) using double mixing techniques. The provisional bridge was constructed (Success SD, Promedica Neumunster, Germany) and cemented with temporary cementation (Temp-BondNT, Italy) (Figure 5).

Pouring the maxillary final impression was done with CAD/CAM special stone (BEGO/Germany), die preparation, ditching and finish line exposure were done. The master casts were mounted on laser scanner (Cynoprod Canada Inc. Listings, Montreal, Canada) for scanning and capturing the preparation (Figure 6). The scanner is connected to the computer screen by the software program 1.3 EVLOTION (Cynoprod Canada Inc. Listings, Montreal, Canada) for milling the zirconia core. The core build-up was done with Vita In-Ceram YZ Disc (VitaZahnfabric/Germany).

Try-in for the milled bridge was done in the patient's mouth. Then, shade guide selection using the shade guide VITA System 3D-Master (Vita Easyshade (R) Compact, Vita, Germany) was done; the selected shade was (2R1.5-3D master) (Figure 7). The master casts were mounted in Di-Lok tray to prepare the die (Di-Equi Dental Products, Wappingers Falls N.Y). Porcelain build-up was done with porcelain VITA VM(R)9 (VitaZahnfabric/Germany). The final shape of the porcelain bridge was the same as in the CAD.CAM machine (Figure 8).

At the final step, porcelain try-in of the bridge in the patient's mouth was done, interocclusal adjustment, canine guidance, as well as protrusive and lateral movements were checked before glazing. Pre-apical x-rays were taken (figure 9). Cementation of the glazed all ceramic bridge was done with resin cement (Relaxy XTM, UnicemAppliCap Resin Cement, 3M ESPE, Germany) (figure 10). Post-operative periapical x-ray was taken (Figure 10). All the steps of constructions, fabrications, and cementation of the all ceramic bridge were following the manufacturer instructions. The case was followed-up for maintenance.

### **III. Discussion**

Restoring the anterior segment generally with a prosthesis is considered to be difficult and in the esthetic zone for a young female is even more challenging. Careful planning of the management of space for missing teeth in younger individuals is crucially important (8)

The existing bridge was sectioned from the labial gingival portion, extend to the bucco-incisal, then lingually to the end of the crown. The technique was a complete comfort to the patient and non-traumatic to the abutment teeth. It had been selected to preserve the underlying tooth structure, the surrounding gingiva and periodontal tissues as mentioned by Al Moaleem et al (9), and Al Moaleem MM (10).

A smile is a gateway to success. The magic of an improved smile can instill confidence in a patient to a degree unimaginable. Since smile is a complex phenomenon which involves colors, illusions, proportions, etc. to achieve the desired result one has to encompass all the principles of aesthetics (11).

It has become increasingly common in the clinical practice to come across patients who are in search of cosmetic procedures since the presence of an aesthetically pleasing smile directly affects the individual's social life. Therefore, it is extremely important that the professional is able to meet the demand of function and aesthetics as desired by the patient (12).

The clinical significance of this case is that all ceramic bridge resulted in a marked symmetry of anterior teeth in the aesthetic zone and improvement in the aesthetic appearance. Also enhances periodontal health. Furthermore, the size of teeth resulted from all ceramic restorations improve the lip position regarding smile line.

### **IV. Conclusion**

The dealing with young, female patients complained of an aesthetic in the anterior zone sometimes treatment plans are also, affected by those patients' demands. To provide improved symmetry and aesthetics to satisfy the patient requirements, dentists have turned to advanced and exciting materials and digital techniques. This case shows an excellent aesthetic outcome due to replacing of an existing old MC bridge with new all-ceramic restoration on a zirconia oxide base fabricated by CAD/CAM. The evolution of dental materials continues to revolutionize the way we practice modern dentistry, satisfying a maximum patient and clinician demands.

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**Figure 1;** pre-operative intraoral view **Figure 2;** pre-operative panoramic x-ray



**Figure 3;** CAD/CAM design of the bridge **Figure 4;** Double retraction cord application



**Figure 5;** provisional Bridge with the new shape **Figure 6;** The master cast with detached abutments on the scanner machine



**Figure 7;** Intra-oral core try-in and shade selection **Figure 8:** the 3 unit bridge after porcelain build-up



**Figure 9:** post-operative pre-apical views, **Figure 10:** Bridge during try-in and after cementation