

# Zirconia Based Crowns for Esthetic Rehabilitation of Severely Discolored Teeth

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## Case Report

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## Abstract

According to studies, the smile is the first contact in human relationship. With the "media smile" in our society today, esthetic concerns of our patients are increasing. In our article a 38-year female patient consults for an esthetically compromised smile due to discolored upper anterior teeth and she requests anesthetic smile rehabilitation. Incisive, canines and premolars were restored with CAD/CAM zirconia based ceramic crowns.

**Keywords:** Zirconia; Discolored Teeth; Esthetic

## Introduction

The rehabilitation of an unaesthetic smile in the anterior maxilla's is always a clinical challenge, especially when an improper shape and size, old restorations, and unaesthetic shading are present [1]. Decision-making is a fundamental aspect of clinical dentistry. Advances in technology and trends towards more conservative technologies have broadened the options available to patients and dentists, increasing the range of choices and opportunities to restore teeth [2]. Porcelain veneers have been shown to be a good conservative and aesthetic treatment option. However they do have limitations, such as important discolorations or extended carious lesions, in similar situations full coverage crowns should be indicated [3]. All-ceramic crowns have been used over the last four decades as an alternative for porcelain-fused-to-metal crowns to overcome their aesthetic limitations. All-ceramic crowns can be made from different types of ceramics and not all ceramic types have the same physical and esthetic properties [4]. Currently, high translucency zirconia is an option worth considering

for restorations stained to be aesthetically superior and serve patient well for years [5].

## Case presentation

A 38-year healthy female patient presented for restoring her maxillary teeth at the fixed prostheses department of dental clinic of Monastir. She complained about anterior dental discoloration and asked for anesthetic smile. Intra oral examination showed cervical decay with significant substance loss, the central incisors and the right lateral incisor have been filled with a composite resin dating since three years (Figures 1 & 2).



Figure1: Extra oral view Initial smile.



Figure 2: Intra oral view.

The dental substance loses important as well as unfavorable occlusal context presented by a deep bite. Therefore, veneers cannot be indicated. Ceramic crowns were indicated for maxillary incisors, canines and first premolars, since we need to extend the preparation in the sulcuso cover all the discolored abutment, zirconia crowns were indicated. The preparations needed to be extended in the sulcus to cover all the discolored abutment, zirconia crowns were indicated. The optical behavior of the zirconia systems evaluated is different from the human dentin. Such difference should be taken into consideration to achieve a highly esthetic restoration with a natural appearance [6]. Teeth preparation was done with appropriate instrumentation and a temporary prosthesis was bonded (Figure 3 & 4). Prostheses were fabricated using indirect CAD/CAM technique. Zirconia infrastructure was tried and the space left to the feldspathic ceramic was verified (Figure 5). Esthetic and occlusion relationship were checked and the crowns were seated after ceramic glazing (Figure 6).



Figure 3: Teeth preparations.



Figure 4: Temporary prostheses.



Figure 5: Trying infrastructures.



Figure 6: Extra-oral view after adhesive cementation.

### Discussion

Extensive and cervical tooth decay as well as defective and significant resin restorations, exclude the indication of veneers in favor of all ceramic crowns. In case of severe discoloration and subgingival margin, zirconia crowns are suitable alternative. Zirconia-based tooth-supported crowns showed promising clinical results restoring anterior teeth [7-10]. CAD/CAM technology in the manufacture of Zirconia has become a reality in dental practice that demonstrate important physical and mechanical properties of high strength, adequate fracture toughness, biocompatibility and esthetics outcomes [11,12]. Many factors can affect the final result, such as occlusal relationship and/or the presence of parafunctions like bruxism and clenching, that may engender significant overloading where it is necessary to give a due care to occlusion control [13]. In addition, effect of surface treatment on the performance of all-ceramic restorations is highly important, because occlusal adjustment resulting in rough surfaces before cementation is very common [14]. However, the initial strength and survival rate of a dental Y-TZP ceramic material to fatigue testing was found to be highly dependent upon surface preparation more so than exposure to various hydrothermal exposure conditions [15]. It is thus necessary to adjust occlusion before glazing to compromise the surface roughness of ceramic. In case of subgingival margin, it is difficult to manage bonding procedure where it is necessary to choose a resin based cementation.

## Conclusion

Esthetic demand of patients is widely increasing mainly in case of esthetically compromised anterior maxillary teeth by the presence of defective restorations. Full coverage Zirconia crowns are currently a suitable solution in case of discolorations and subgingival tooth decay.

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