



CASE REPORT

Enhanced Esthetics by All- Ceramic Crown- Case Report

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ABSTRACT

Dentistry today is not focusing on prevention and treatment of disease but also fulfilling the demand of patients for better esthetics. Full coverage crowns now a days not meant by porcelain fused to metal but in respect of recent advancement in dental materials have prompted the development of a large number of all ceramic systems for fabrication. These crowns are clinically more acceptable due to their enhanced aesthetic, biocompatibility and inertness and they are replacing metal as a core material for crown. Development of digital technology have improved the accuracy and aesthetics of all ceramic system and are providing better aesthetics than previous all ceramic system. This case report presents the management of a central incisor with an all-ceramic system.

INTRODUCTION

Introduction:

Unaesthetic discolored teeth especially in the anterior region are a cause for concern for patients. The look-conscious patients may even suffer from a loss of confidence and social anxiety due to their imperfect teeth.^{1,2,3} Full ceramic crowns have come as a blessing for such patients. They have provided a cosmetic alternative to the traditional metal-ceramic crowns which have been employed since ages. It is sometimes not possible to establish an esthetic smile only through restorations. Along with the prosthesis, it is essential to take into consideration the correct distribution of the teeth and also maintain a width to height ratio such that the final outcome is esthetic and pleasing to the eye.¹⁴

CASE REPORT:

A 32 years old female patient named Shipra Sharma reported to the Department of Prosthodontics, Vyas Dental College & Hospital, Jodhpur, Rajasthan with the chief complaint of discolored upper front tooth. The patient gave a history of trauma to the front tooth after a fall 2 years ago. No dental treatment for the aforementioned tooth had been carried out.

On intraoral examination discoloration with tooth 21 was observed. However, the tooth did not show any signs of mobility, fracture, caries or periodontal disease. Furthermore, the tooth was not malpositioned, rotated, tilted or otherwise compromised/ destructed in any manner. Slight spacing was observed interdentially between the maxillary anterior teeth.

Pulp vitality testing presented non- vital pulp with calcified root canal. The patient was extremely conscious regarding her appearance and expressed concern regarding aesthetics and shade matching. Diagnostic impressions and study models were prepared.

The diagnostic wax-up aided the patient in visualizing the final outcome of the treatment. The facial, oral, and tooth proportions, the incisal edge position, the occlusal parameters, speech, and smile were evaluated at this stage and approved by the patient.

It was decided to fabricate a full- ceramic zirconia crown in the maxillary central incisor, maintaining some spacing between the teeth for an esthetic, natural appearance. The crown was to be fabricated for the tooth after endodontic treatment with the same. Patient was counseled and explained the treatment plan & her consent was taken to go ahead with it.

CLINICAL PROCEDURE:

Endodontic therapy was carried out with the maxillary central incisor 21 followed by a composite post- obturation restoration. Next, tooth preparation was done for a full- ceramic crown. Shoulder-type margin was given extending subgingivally below the gingival margin (Figure 1, 2).^{4,5}

Prior to the impression making, gingival retraction was done with gingival retraction cord (Ultrapack 000). Impressions were made with addition silicone (Affinis polyvinylsiloxane, Coltene, Germany). (Figure 3).The impressions were poured in a minimal- expansion, vacuum spatulated Type IV die stone (GC Fujirock, Belgium, Europe) and dies were obtained.

Meanwhile, a provisional crown was fabricated for the tooth using tooth colored self- cure acrylic (DPI, Mumbai, India). (Figure 4).The provisional crown was cemented in place using a temporary cement (GC Freegenol, Europe) (Figure 5).

Shade matching was done with the help of the Vitapan 3D Classic shade guide. Shade of the prepared tooth as well as shade of the adjacent teeth was noted. Shade map of adjacent teeth covering three areas cervical, body and incisal areas were duly recorded.

The fabricated coping (Figure 6) was tried in the mouth and inspected for marginal fit. Thereafter, the crown was fabricated. Try-in of the crown was done before final glazing. At this stage, occlusion, margins and seating of the crown were evaluated. Then the crown was glazed. Prior to cementation, it was etched with a porcelain etchant (Angelus 10% Hydrofluoric acid) for 20 seconds, washed with water and air dried. Then a silane coupling agent (Monobond S, Ivoclar Vivadent) was applied to the crown surface for 60 seconds and lightly blow- dried. Then a dentin- bonding agent (Multilink, Ivoclar Vivadent) was applied over the surface and light cured for 20 seconds.¹⁰

At the same time, the prepared tooth was etched with an etchant (37% Phosphoric acid) for 15 seconds, washed thoroughly with water and dried. After etching, frosted appearance of the enamel was noted. Then dentin bonding agent (Multilink, Ivoclar Vivadent) was applied over the tooth surface and light cured for 20 seconds.

Next, the crown was cemented into place using a self- adhesive resin cement (RelyX, 3M ESPE, US) followed by initial tack light curing for 5 seconds after which the excess cement flash was removed from the margins using a scaler and from the interproximal areas using diamond- coated abrasive strips. Later, the light curing was completed for 20 seconds. (Figure 7, 8). The occlusion was checked in protrusion and in lateral excursions. The patient seemed satisfied with the final outcome of the treatment. Printed and oral instructions for maintenance and use were duly given to the patient.^{15,16}

DISCUSSION: Porcelain-fused-to-metal (PFM) restorations are widely used full-coverage crown restoration systems, their inherent properties make the achievement of natural aesthetic restorations an elusive task. In contrast, the all-ceramic systems offer excellent translucency and vitality, without the opacity associated with PFM restorations.⁶

All ceramic restoration's vitality is further enhanced by an adhesive resin cementation method that conducts the color of the underlying tooth structure. Among various all ceramic systems, Zirconia was selected for the fabrication of all ceramic crown in the present case.^{10,11}

As an opaquer, it has got better properties to mask the discolored tooth. Hefferman et al suggested that zirconia restoration would be better suited to match opaque, high value teeth.¹²

The new generation adhesive agents combined with highly filled resin luting cements allow to create an integral unit between the restoration and the natural tooth.¹³

This bond provides high compressive strength and low microleakage. The present case report demonstrated the preparation procedure, the importance of well-integrated provisional restorations, and the accuracy in transferring provisional information onto the final jacket crown. It can be concluded that due to their natural appearance, the all-ceramic materials, especially the glass ceramics, blend harmoniously with the oral environment and are particularly appreciated where aesthetics is a priority, especially in the maxillary anterior region.¹⁷

CONCLUSION: A case of anterior discolored tooth rehabilitated using an all-ceramic crown while maintaining some space interdentially to achieve overall desirable esthetics has been described. Ultimately, the aim of the prosthodontist should be to enhance the appearance of the patient and achieve total patient satisfaction.

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