All-ceramic crowns for incisors with discolored margins

All-ceramic materials are increasingly utilised by dental professionals, improving aesthetic dentistry and demonstrating truly life like restorations. While restorations with discolored substrate in anterior region still remains a great challenge. They are often caused by microscopic leakage due to open margins, tetracycline stains, Non precious metal restorations, posts and so on. Nasser Shademan (CDT) explains how to achieve the goal of masking the dark shadow without causing unnatural opaque looking margins.

Preparation of laboratory working models and collection of adequate information concerning aesthetic and occlusion including digital dental photos assists the lab ceramist to produce appropriate provisional restoration that offers a great opportunity for dentist, dental patient and ceramist to study and visualize possible problems that is likely to threaten the success of aesthetic all ceramic restorations.

Achieving beautiful all ceramic restorations begin with discovering what is simply not beautiful in window of oral aesthetics. Here the author utilizes water color techniques to demonstrate a helpful method in planning aesthetical ceramic build-up guide, a map to assist ceramist with additional knowledge, to apply the right portion of ceramic with appropriate chroma, hue or, value at right parts of each tooth in a similar way that nature does! So they appear as if they actually belong there. Remember that often to beautify the nature is to apply modification without completely changing its biological, natural character!

Preparation of pressed ceramic caps is done considering all aspects of aesthetics such as tooth position, smile line, midline, gingival position in aesthetic zone, facial structure elements relevant to colour –form and texture of teeth in oral window, discoloration and its impact on prepared tooth, etc.

The case presented here demonstrates inadequate preparation (on margins) of patient’s natural tooth that results in insufficient room for conventional pressed all ceramic layering technique and at the same time there are sever discoloration on margins of prepared teeth. Failure in understanding the optical behavior of different all ceramic materials will also limit the ability of dental ceramist to choose the right material for right case.

Masking the dark influence of underlying tooth is planned by measuring the room available for layering technique according to final contour of aesthetic restorations, after which ceramist could better decide on the sufficient amount of pressed core thickness to accommodate space for alternate layers of ceramic.

The desired level of chroma in opaque dentine will be achieved adding mixture of white, orange, ochre, brown stains into it, note that the nature of original shade should not be disturbed. Knowing roles and science of ceramic color to replicate individual shade is important and needs not to be compromised.
Selecting the right brush move to closely mimic the unique proprieties of natural tooth structure minimizes failure and provides wonderful experience as ceramic build up is completed.

Dentine color effects needs to be placed as planned based on information collected form existing neighboring teeth. Careful study of overall composition, feminine or masculine indications, tooth texture & body anatomy could assist ceramist to reproduce natural aesthetics in harmony with oral environment.

Figure 1 : Preoperative photo from a female patient with four upper incisal teeth exhibiting very unnatural appearance

Figure 2 & 3 : Prepared maxillary incisors with severely discolored margins

Figure 5 & 6 : Artistic painting of prepared teeth in water color technique, to assist ceramist as aesthetical ceramic layering and build-up guide

Figure 7 : Measuring the width of papilla to estimate correct interproximal height-contour in harmony with aesthetic requirements

Figure 8 : Measuring mesio-distal width of left central in comparison with right central to guide ceramist producing symmetric sizes
Figure 9: Studying mid-line

Figure 10: Model before fabrication of press ceramic caps

Figure 11: Completed press ceramic caps

Figure 12: Building ceramic to find out correct position of centrals

Figure 13: Completing dentine build up

Figure 14: Masking underlying discoloration with mixture of opaque dentine and different stains

Figure 15: Palatal view of incisors

Figure 16: Anatomically reducing the size of dentine in one third incisal to create room for application of enamel and translucent layers
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Figure 17: Application of dentin internal color effects to replicate the natural dentin effects observed in individual patient’s tooth.

Figure 18: Enamel build up according to enamel form and design in natural tooth.
Figure 19: completing the form with translucent layers.

Figure 20: Two maxillary left central-lateral teeth inserted.

Figure 21: Inserting the rest of maxillary incisor crowns.

Figure 22: post operative view of all ceramic crowns immediately after insertion.

Figure 23: note successful masking of discolored margins without over contouring cervical emergence, to demonstrate excellent results.

Figure 24: view of the smile with definitive all ceramic restorations, natural and beautiful!

ABOUT THE EXPERT

Nasser Shademan (CDT) is a German-trained dental technologist, technical instructor and lecturer for a number of leading German dental companies in advance dental techniques, such as laser and plasma welding technology (Schutz-Germany) precision attachment techniques (ZL-Microdent Germany). With years of experience in the field of cosmetic dentistry, over various parts of the world, including Europe and Southeast Asia, Shademan has a great passion for the ceramic art of dental technology.

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