University J Dent Scie 2024; Vol. 10, Issue 2

Omnichroma – A Single Shade Composite to Rule Them all : A Case Series

Abstract:

Introduction : One of the most admired features of restorative materials is their aesthetics. Color matching between the resin composite and the teeth is the most aimed target by the patient to evaluate the quality of the treatment. With the advent of mono shade universal composites it is essential to deliver an esthetic restoration that symmetrically blends with the patient's adjacent teeth.

Aim : The aim of this study was to evaluate color matching ability of mono- shade universal composite Omnichroma (TOKUYAMA)

Methodology : Shade matching selections were conducted in two different lighting environments: 'out-of-doors', natural sunlight (NSL) and 'in-doors' under cool white fluorescent (CWF) lighting. Throughout the course of the study, the natural sunlight exercises were conducted during the same daylight hours, in keeping with dental clinic hours.

Results : Success Assessment was done through visual assessment and by voluntary observers group, non-dental observers (GP) matched shade tabs-to-tabs and dental students (DS) and dentists (DD), photographic assessment and patient satisfaction. The scores were graded on the basis of Modified US Public Health Services Ryge Criteria.

Clinical significance: A material that blends well and exhibits pronounced color adjustment potential would likely improve the color match and therefore the esthetic outcome. These materials "work" for dental professionals by compensating for their suboptimal shade matching and/or lack of an excellent match in the used material. This case series aims to further the understanding of the inherent properties of RCs and allow clinicians to fully utilize them to place RC restorations and minimize the time spent on modifying or replacing existing ones. Hence, the outcomes would encompass the increased chairside efficiency, enhanced esthetic outcome, and patient satisfaction.

Key-words: .....

Introduction:

For a restoration to be esthetically pleasing, the color match between the resin composite (RC) material and the natural tooth must be so similar that no difference can be detected by the human eye. When it comes to color appearance, the selection of RC for restorative procedures depends on its color compatibility, color stability, and color interactions. Selecting the RC that will provide the closest match to natural tooth color requires a thorough understanding of light interactions with the tooth surface and RC restorations under varying conditions.[1] To ensure an esthetic outcome, an imperceptible match of the color of the restorative material to that of the tooth is of utmost importance. The polychromatic nature of natural teeth makes shade selection more challenging.[2] Composite resins have been developed commercially in multiple enamel and dentin shades of differing translucencies and opacities,[3,4] as measured according to the VITA Classical shade guide. This complicates the shade matching procedure, requires more inventory, and results in an increase in cost and chairside time. "Blending effect" (BE) or "chameleon effect" describes the ability of a material to acquire a color similar to that of its surrounding tooth structure.[5,6] This has enabled the introduction of composite materials with modified optical properties and thus, a reduced number of shade.

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Received : 20 March 2024, **Published :** 31 July, 2024

How to cite this article: Thakur, T., Desai Prathmesh Prakash, Minocha, A., & Singh, B. P. (2024). Omnichroma - A Single Shade Composite to Rule them all : A Case Series. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 10(2).

Access this article online

Website: www.ujds.in

Quick Response Code

DOI: https://doi.org/10.21276//ujds.2024.10.2.11

Materials and Methods:

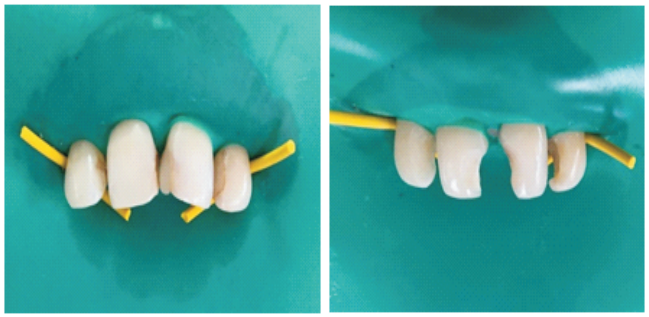
The study protocol was presented to and approved by the local Ethics in Research Committee prior to the experiment. All the individuals involved were invited to participate in dental shade matching exercises on a voluntary basis. Prior to shade matching participation, each individual was screened for color vision recognition ability by correctly identifying selected plates from the Ishihara Color Vision Test.

The voluntary observers fell into one of three distinct categories predicated on their dental knowledge and dental shade experience: (1) general population (GP) with no dental shade experience, (2) first year dental students (DS) with no clinical shade experience, and (3) dentists (DD) with a range of years experience. The gender and age of the participants were recorded. Shade matching selections were conducted in two different lighting environments: 'out-of-doors', natural sunlight (NSL) and 'in-doors' under cool white fluorescent (CWF) lighting. Throughout the course of the study, the natural sunlight exercises were conducted during the same daylight hours, in keeping with dental clinic hours. Success Assessment was done through visual assessment and by voluntary observers group, photographic assessment and patient satisfaction. The scores were graded on the basis of Modified US Public Health Services Ryge Criteria.

Case Report 1:

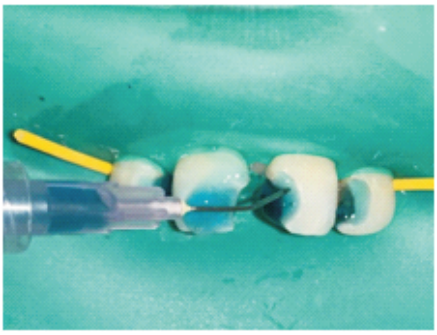
A 32- year old female patient reported with the desire of changing the old aesthetically unpleasant restoration reported in the Department of Conservative Dentistry and Endodontics in H.P.G.D.C. Shimla, India.

Pre-operative Photograph

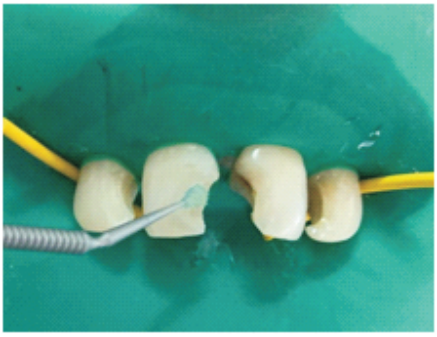


Teeth Isolated and Cavity Prepared

Omnichroma Composite

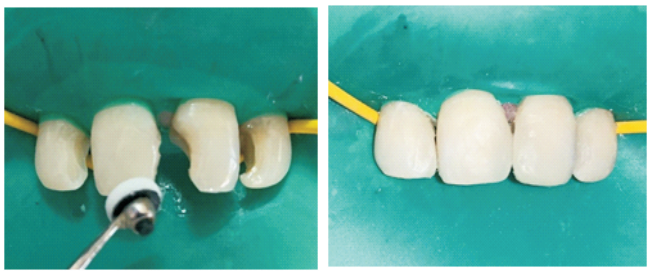


Acid Etching



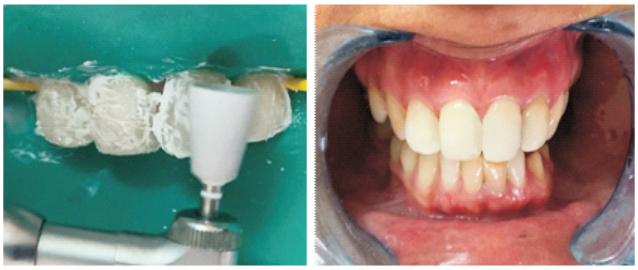
Application of Bonding Agen

Placement and Manipulation of Composite

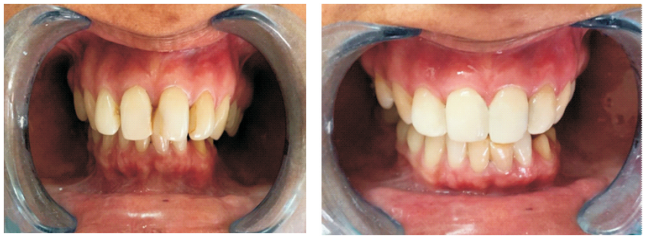


Before Finishing and Polishingt

Finishing and Polishing Procedures



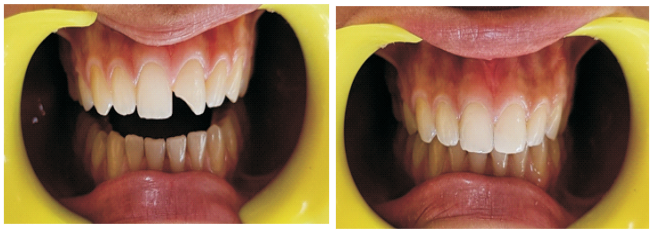
After F/P Procedure



Before After

Case Report II :

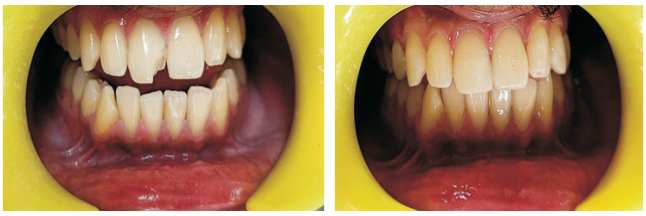
A 20 years old female reported in the Department of Conservative Dentistry and Endodontics with the chief complaint of broken tooth in the upper left front region. On examination a simple composite restoration with omnichroma was planned.



Before After

Case Report III :

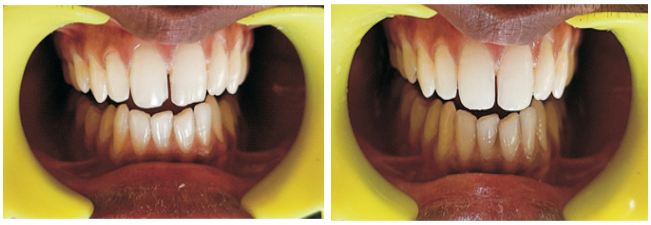
A 28 years old Male reported in the Department of Conservative Dentistry and Endodontics with the chief complaint of broken tooth in the upper right front region. On examination a simple composite restoration with omnichroma was planned.



Before After

Case Report IV :

A 24 years old Male reported in the Department of Conservative Dentistry and Endodontics with the chief complaint of broken tooth in the upper right front region. On examination a omnichroma composite restoration was planned.



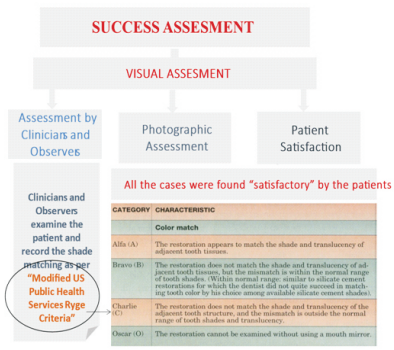
Before After

Case Report V :

A 19 years old Female reported in the Department of Conservative Dentistry and Endodontics with the chief complaint of discolored tooth in the upper right front region. On examination composite restoration with omnichroma was planned.

Before After

Results : Success Assessment :



- All the cases in this case series were graded "A" except for Case III which was graded "B" by one of the Operator.

Discussion :

Color matching depends on different chromatic features that are associated with resin composite and teeth such as hue, chroma, and value; opalescence, translucency, and fluorescence; light diffusion and transmission; and surface texture properties.The color of underlying dentine has an effect on tooth shade.It is imperative for restorative material to imitate the natural tooth with all chromatic characteristics along with the color stability to have ideal esthetics.

Omnichroma (TOKUYAMA) is a Single Shade Structurally Colored Universal Composite which reflects similar shades to those of surrounding teeth. This Smart Chromatic Concept are specified to match entirely 16 VITA Classical shades making color matching less challenging. The composite's 260nm spherical fillers are the exact size and shape needed to generate red-to-yellow color—the range found in human teeth. As light passes through the fillers, it produces this red-to-yellow spectrum and combines with the reflected color of surrounding dentition to create a perfectly seamless match.

Few studies have investigated the color adjustment potential of "OMNICHROMA", and currently, there is very limited evidence of its *in vivo* performance. Results of the current case series showed that clinically the color matching ability of single shade composite was remarkable as supported by some previous studies. (Durand *et al*. 2021 and Pereira Sanchez *et al*. 2019)[7,8].

Since Patient's satisfaction is an important aspect of aesthetic dentistry , Patient's acceptability evaluation was done and showed satisfactory results in all cases in comparison to clinician visual scoring which can be attributed to knowledge and skill as supported by previous studies. (Ragain JC et al. 2000& Nagi M et al. 2022)[9,10]. In the oral cavity, multiple factors influence the way shade match is perceived, including the morphology of the tooth, the area where the tooth is restored, the influence of the surrounding soft tissues, among other factors. In addition, natural teeth are polychromatic, multilayered, translucent, and curved, which affects the way light is reflected or scattered. All these factors may affect the way composite materials behave in vivo as well as how they are evaluated with an instrument. Single and group shade composite resins have been introduced to streamline the process of shade matching. However, further research is required to evaluate their predictability, by using natural teeth in vivo and testing a wider range of shades

Limitation :

This Case Series involved only one aspect i.e. visual assessment of color matching. For more accurate shade matching spectrophotometer Vita Easy Shade V should be used.

Conclusion :

The broad color-matching ability of OMNICHROMA eliminates the need for a shade-matching procedure and reduces composite inventory, allowing clinicians to:

- minimize chair time,
- the wastage of unused composite shades, and
- reduce reliance on shade-matching procedures.

There was a high satisfaction level among the patients for the single shade universal resin composite.

Acknowledgement : The institution (H.P. Government Dental College and Hospital) , Shimla, India.

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