GCCC Global Clinical Case Contest 2024-2025

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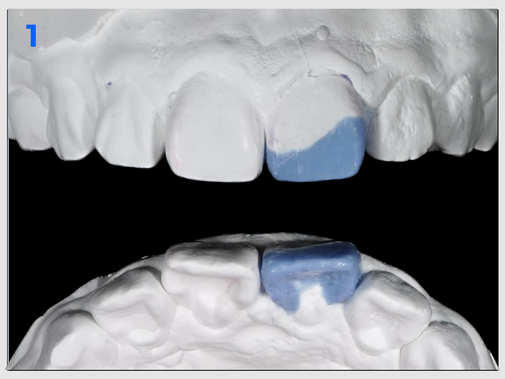
Introduction to the case

A 24-year-old male came to our department after fracturing his upper left central incisor from a traffic accident one week ago. The patient desired to have esthetic appearance as soon as possible after the accident although there was potential need for endodontic treatment. The treatment plan of direct composite restoration followed by close monitoring for tooth vitality was decided.

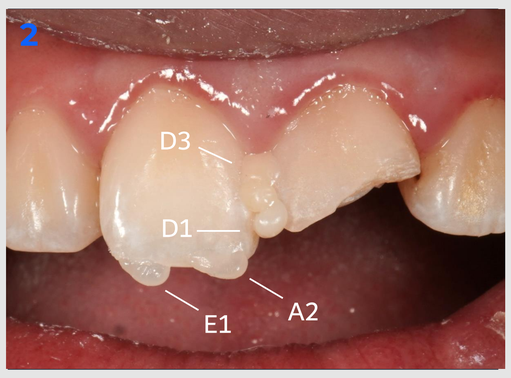
Pre-operative View of Fractured Tooth 21 with Slight Rotation

Post-operative View of Tooth 21 with Harmonized Esthetic Appearance

Treatment steps



Step 1 Diagnostic Wax-up and Silicon Index
A diagnostic wax-up was fabricated to match the outline of tooth 11. Due to the slight buccal rotation of the distal side of tooth 21, efforts were made to harmonize the misalignment between two central incisors.



Step 2 Color Mapping and Shade Selection with Spectra® ST Resin
Shade matching was performed with resin buttons before tooth dehydration. Since the fractured tooth was slightly discolored, a D1 shade was chosen to brighten the color of tooth 21 and coordinate it with the contralateral tooth.

Step 3 Cavity Preparation

After removing the previous temporary restoration and smoothing the sharp edges of the fractured tooth, a 2 mm bevel was prepared for enhancing the integration of restorative materials and the margin.

Step 4 Palatal Contour Build-up and Proximal Wall Fabrication
After DeTrey® conditioner 36 etching and Prime&Bond® Universal adehesive treatment, the outer framework of tooth 21, including the palatal contour and proximal wall, was fabricated using a silicone index and Mylar strips.

Step 5 Layering
Five dentin mamelons were built to mimic the same structures of tooth 11, with the mesial and distal ones being pronounced than three middle ones. A translucent enamel shade was applied between the depressions to create an opalescent effect.

Step 6 Tooth Characteristic Refinement

White patches over distal side and incisal edge of tooth 11 was prominent. This characteristic was mimicked by using white intensive tints to form the white patchy area.

Step 7 Morphology Refinement, Finishing and Polishing

To correct the rotation of tooth 21, tooth shape was modified by the usage of fine-grit diamond bur. Finishing and polishing were done with Enhance Finishing® system and Enhance® PoGo® system.

Step 8 Rehydration
At the follow-up visit one week later, the postoperative view of tooth 21 showed an appearance in harmony with the contralateral tooth in terms of color and shape. The vitality of the tooth was under monitoring.

Material and Method

The diagnostic wax-up and the following silicon index were fabricated to aid the built-up of tooth outline shape. The mild rotation of tooth 21 was modified to create a more harmonized appearance(Fig. 1). Shade selection was performed by resin buttons with **Spectra® ST resin**(Fig. 2). After removing the temporary restoration and smoothing the fractured margin, a 2 mm bevel along the fractured margin was prepared for better integration of tooth colors and restorative materials (Fig. 3). Adhesive procedure was accomplished with the treatments of **DeTrey® Conditioner 36** and **Prime&Bond® Universal.** The layering restorative process started with the use of E1 shade to build palatal surfaces, A2 for proximal wall, D1 shade for dentin body and also for halo(Fig.5), then white intensive application and A2 enamel shade to mimic tooth 11. Finishing and polishing were performed using the **Enhance Finishing®** and **Enhance® PoGo®** polishing systems to achieve a smooth surface texture.

Discussion and Conclusion

For direct composite restoration of class IV defects, proper shade selection and restorative material management to simulate the subtle tooth structure can be challenging. A deep understanding of the properties of restorative materials and carefully manipulating them in the layering procedure contribute to a natural appearance with excellent esthetics of tooth.