

Management of Tooth Trauma

Ellis Class II Fracture Case Report

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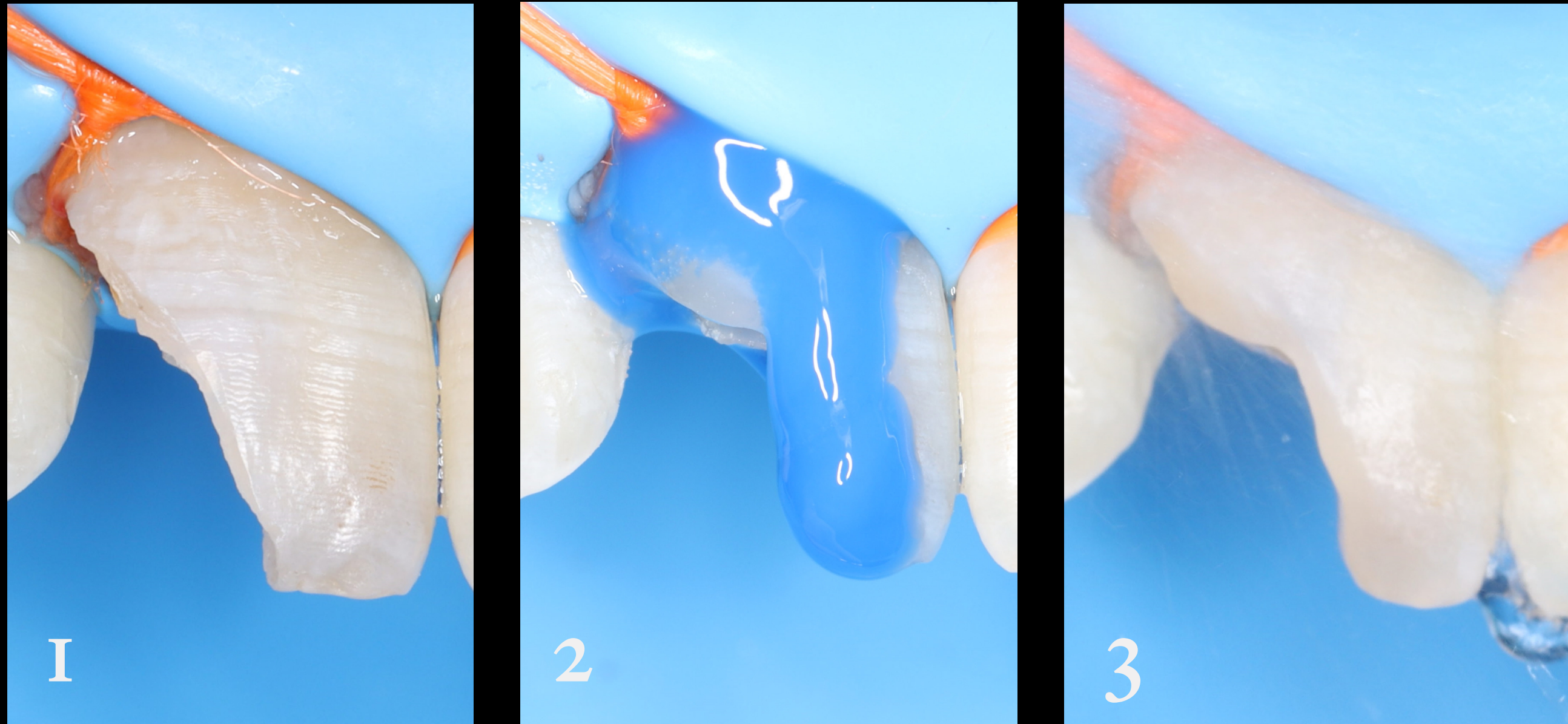
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Introduction

Restoring a single fractured central incisor presents a significant challenge for restorative dentists, as the objective is to achieve an esthetic and natural-looking outcome. To accomplish this, it is essential to have a comprehensive understanding of composite layering techniques, meticulous application of tints and opaques, accurate replication of incisal translucency, establishment of proper anatomical form, development of surface texture, and the application of an appropriate polish. Given the patient's young age and the preference for a conservative approach, direct composite resin was selected as the restorative material for this case. However, achieving an esthetically pleasing result is not the sole factor to consider; it is equally important to address functional aspects. This entails the development of a seamless and harmonious guidance pattern in both protrusive and lateral movements, which is critical for a successful restoration.



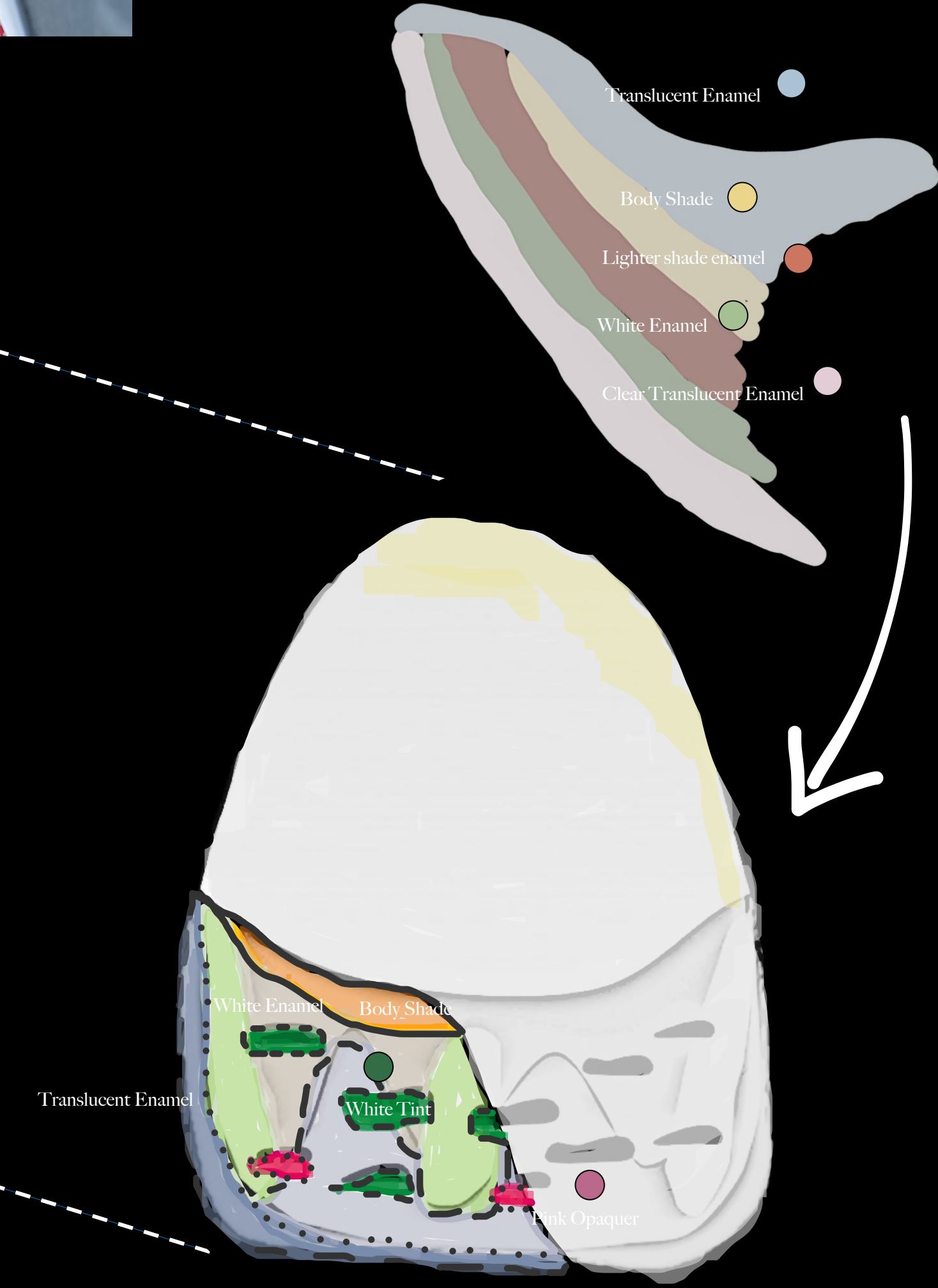
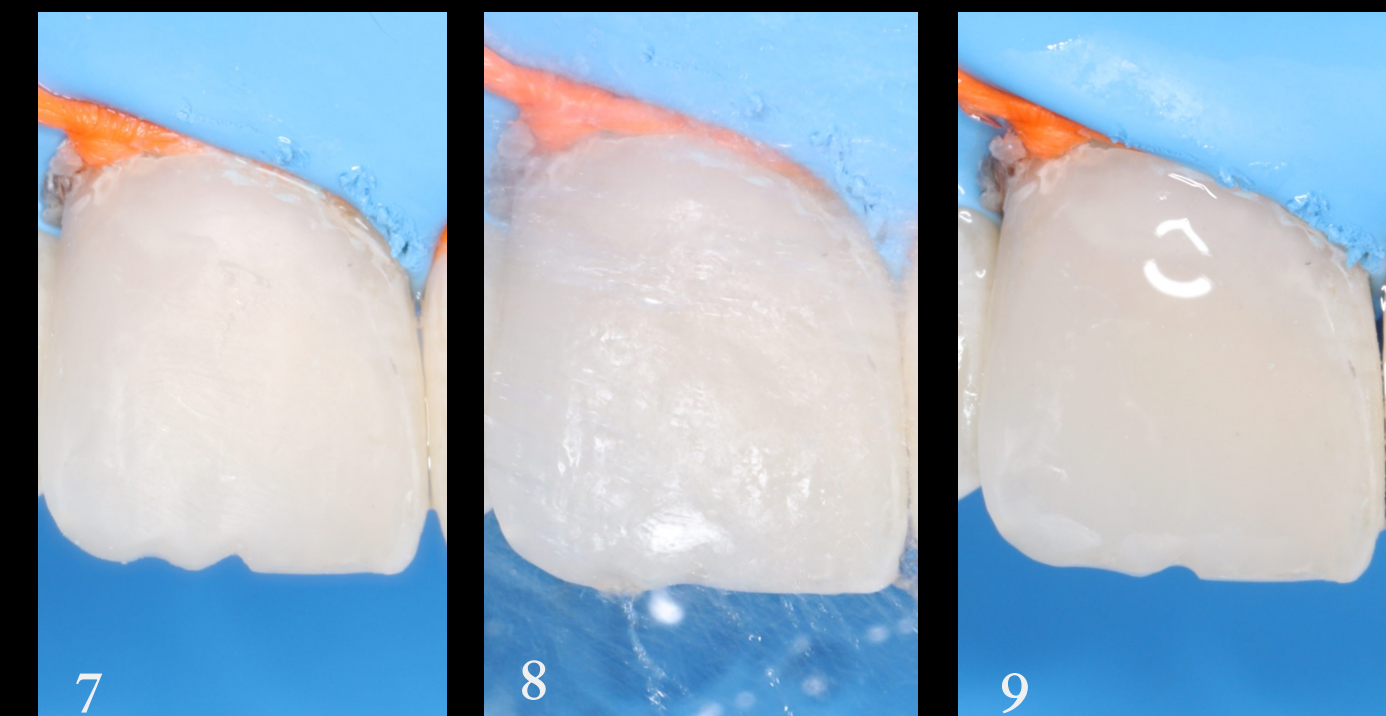
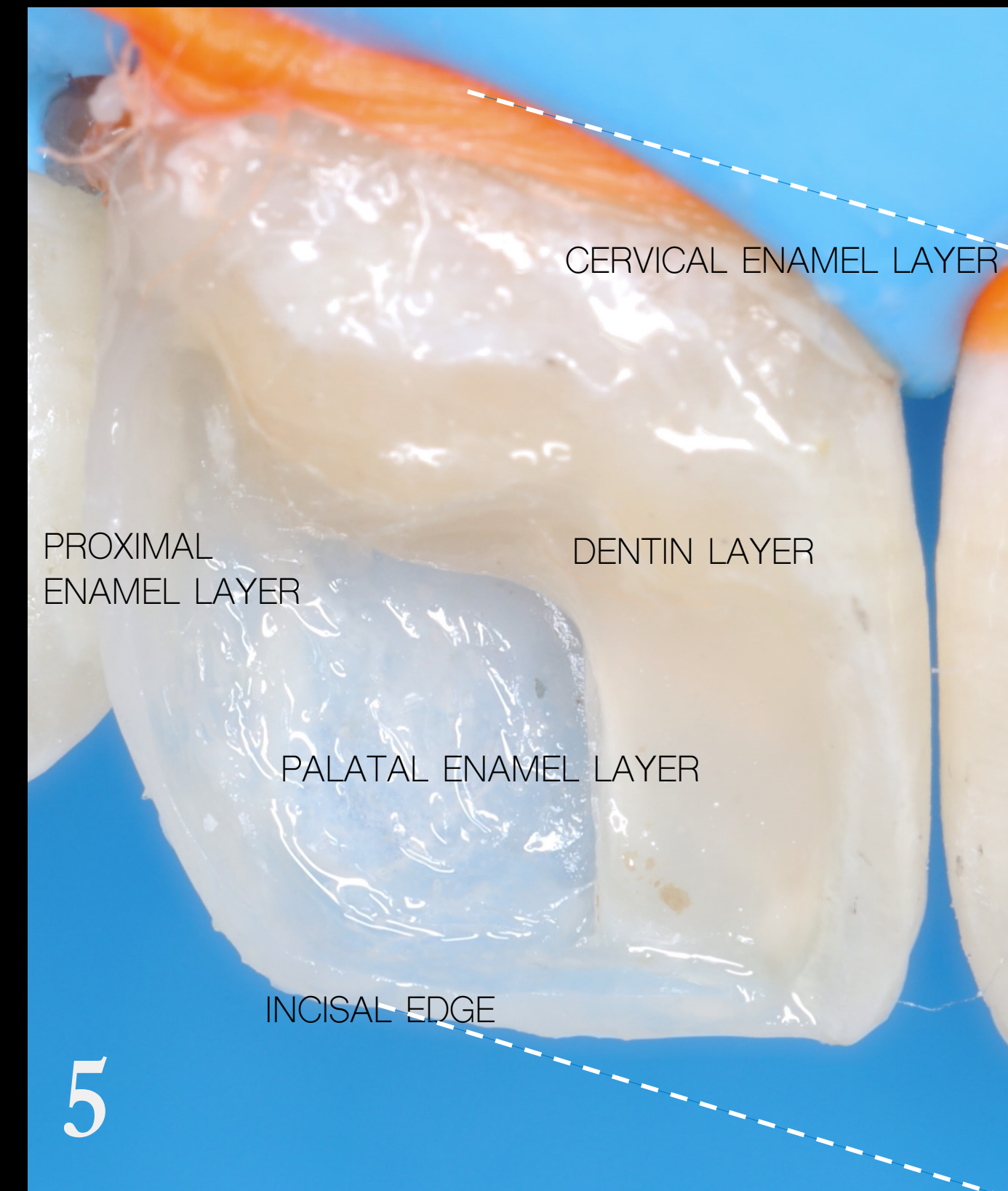
Prior to the procedure, pre-operative photographs were captured to examine the fractured portion of the tooth. A periapical radiograph was also acquired to assess the presence of any underlying disease. The radiographic analysis revealed a healthy root and pulp, with no signs of pathology. Clinically, the tooth presented as asymptomatic, demonstrated no mobility, and elicited a negative response to percussion testing. Additionally, there was no evidence of periapical disease. The fracture was observed to extend into the enamel and dentin layers without any pulp involvement, and no pulp exposure was detected.



In this step, Isolation was done preparing the teeth for the restorative work. Choosing GC Essentia MD and LE to offer her a color matching naturally looking white teeth. Detry Conditioner 36 gel was applied on enamel surface followed by application of Prime&Bond universal, blowing using air syringe for 5s, then light curing for 20s.



Palatal Index, A high viscosity addition or condensation silicone impression obtained from the wax-up model. Further, this impression is cut in the region of the incisal edges with a scalpel blade so that the cut does not invade the region of the incisal edge.



The composite resin employed for this case was the GC Essentia MD and LE shades. To enhance its pliability, the composite resin was subjected to a warm water bath. The initial shade, known as Palatal Enamel, was positioned into the putty matrix, covering only the area of the missing tooth structure. This matrix was then fitted into the patient's mouth. Using a composite instrument, the composite was molded into the matrix, integrated into the lingual facet of the tooth, and thinned on the facial aspect to form a translucent palatal shell to serve as the foundation for facial direction development. Following light-curing of the resin, the putty matrix was extracted, leaving behind the translucent palatal shell. Medium Dentin was introduced into the tooth's center using a composite instrument to duplicate the dentin shade and lobe structure. LE Enamel and Translucent Enamel were employed to establish line angles and generate some facial form. Light Enamel shade was utilized in the mamelon development zones as well as the mesial and distal lobes to emphasize value. To accurately replicate the hue and subtle developmental variations found in the adjacent teeth, a blend of opaque, ochre, and white tints from Kerr were used.

Tints were applied using an explorer and an endodontic hand file, followed by smoothing as needed with a microbrush. A pink opaquer was employed to counteract any grayness present in the restoration. A final layer of Clear Translucent shade was added to encapsulate the color and establish the ultimate facial contours. Facial planes, embrasures, and transitional line angles were developed by shaping the tooth with discs. A four-inch digital caliper facilitated the measurement of both central incisors' widths, ensuring accurate placement of incisal variations in proportion to the contralateral tooth. The palatal surface underwent smoothing with a football-shaped carbide bur and polishing with a cup. Additionally, a #12 surgical blade was utilized to eliminate any excess material and guarantee a seamless interproximal transition from the natural tooth to the restoration.



Conclusion

It was indeed gratifying to deliver a pleasing esthetic result to the patient. However, the functional aspect is equally, if not more, crucial for ensuring long-term success. In this instance, formulating a plan to construct a palatal shell and layer the desired translucency and shading nuances was essential for addressing the esthetic aspect. The appropriate use of tints and colors was vital, particularly when matching an adjacent central incisor with intricate subtleties. From a functional perspective, there were several critical factors to consider. It was imperative to establish a stable centric contact and appropriately contour the lingual surface to harmonize with the joints and muscles. A steep protrusive guidance could likely result in a failed restoration. Therefore, it was necessary to consider the incisal edges of the lower anterior teeth and their relationship to the tooth. The creation of smooth leading and trailing edges on both the upper and lower incisors contributed to the protection of the restoration. The lateral excursive movements also demanded attention to prevent the application of excessive force to the restoration. The patient exhibited canine guidance in lateral excursions, with the central incisors assuming the guidance in crossover functional movements. This term "crossover" refers to the transfer of contact from the canine to another tooth - in this case, the central incisor - which then assumes the load. Although there was some guidance on this restoration, the transition was smooth and harmonious as the guidance was relayed from one tooth to another in an anterior direction. The knowledge and understanding of nature's appearance and texture are crucial in the realm of esthetic dentistry, as nature serves as the quintessential model to emulate.

Keywords: Aesthetics, Fractured Incisor, Resin Composite, Biomimetics

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