

Fractured Anterior Tooth Using Direct Composite Restoration : A Case Report

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Abstract: *Crown fractures are common among schoolchildren. They create serious functional, aesthetic and psychological problems. The clinicians must propose high aesthetics in the front part and the choice of exact treatment plan. Repeated reconstructions are needed in many cases because of compromised results as time passed by. Achievement of promising restoration that preserves its aesthetics and strength is the greatest desire for both children and their parents. In the present article, an esthetic rehabilitation of fractured anterior teeth restored with direct composite resin is presented.*

Keywords: *Composite, esthetic, fracture, restoration, trauma.*

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I. Introduction

Oro-facial trauma, the second most common cause of tooth loss, has a significant negative effect on patient's appearance and mastication. It mainly affects the children and adolescents, especially their maxillary central incisors, which are the most visible. The most common risk factors are falls, automobile/bicycle accidents, collisions, gender and age, some behavioral characteristics, physical and sporting activity (1). The worldwide prevalence of traumatic dental injuries ranges between 6%-37% (2-4). Seasonal variations in the prevalence of trauma have also been reported (5-7). Dental trauma (DT) of the incisors and their supporting tissues, which is one of the most challenging dental emergency situations, requires immediate assessment and management due to psychological and physical reasons (4). This is especially important for young permanent teeth because of continuing development in order to minimize undesired complications. The treatment of dental trauma is sometimes neglected (8, 9) although it might lead to pain, difficulty in articulation and mastication as well as having considerable negative effects on patient's self-esteem (10, 11). However, aesthetics of the anterior teeth are very important aspects of human appearance and could be affected by many factors including the presence of fillings, tooth color, position, alignment, shape and number (2-6).

Crown fractures have been documented to account for up to 92% of all traumatic injuries to the permanent dentition.(1) Dental trauma often has a severe impact on the social and psychological well-being of a patient.(2) Coronal fractures of permanent incisors represent 18-22% of all trauma to dental hard tissues, 28-44% being simple (enamel and dentin) and 11-15% complex (enamel, dentin and pulp). Of these 96% involve maxillary central incisors.(4)Traumatized anterior teeth require quick functional and aesthetic repair.(3) The presence of fracture of anterior tooth severely compromises the aesthetic value of the patient. A complete understanding of the desire of the patient is absolutely critical for success. The repair of tooth fracture with the help of crown and bridge requires high financial expenses, is more time consuming, needs multiple appointment therapy and is a less conservative approach. In the treatment plan the initial option considered should be the most conservative one that will achieve all the desired objectives of both the patient as well as the dentist. Direct composite restoration technique is minimally invasive, economical and successful in repairing tooth fracture with excellent longevity in carefully selected cases and with superior matching ability. (4,6,7,10, 11) In the present article, an esthetic rehabilitation of fractured anterior teeth restored with direct composite resin is presented.

Case Presentation:

A 19 yr old female patient reported to my private dental clinic , with a complaint of fracture in upper front tooth (Fig. 1). Dental history revealed that she met with an accident 2 days back resulting in an injury. Extraoral examination revealed no significant findings. During the intra-oral examination, a class II Ellis fracture of left maxillary central incisor was diagnosed. There was no other pathology associated with the injury. Mild calculus deposits were present but dental caries was not found. Intraoral periapical radiograph clearly shows enamel and dentin fracture without involvement of pulp in the tooth 11 (Fig. 2).



Figure-1: Pre operative view

Root formation of 11 was complete with no periapical pathology. Neither the patient nor her husband was interested in irreversible and indirect treatment option but they are inclined to pursue immediate, more conservative restoration. (Fig. 3). To fully evaluate the case a visual assessment was performed and the patient's occlusion was analysed. Shade matching was done and A1 shade was selected for the case. After getting proper isolation on tooth 21 was thoroughly cleaned and scrubbed. The enamel of the upper right central incisor adjacent to fracture line was roughened in collar like manner and two retentive grooves were made on the mesial and distal edge of fracture line. Following the preparation the tooth was pumiced, rinsed and dried, then the surface was etched for 40 seconds. Again the tooth was washed and dried using air-water syringe. The bonding agent was then applied to the prepared surface and light cured for 20 seconds. A thin layer of composite not more than 1mm in thickness was placed on the right central incisor which covers from facial to lingual preparation. Once the composite placement process was done in accurate and precise position the material was cured for 40 seconds on each surface. During the restoration of right central incisor the adjacent tooth was isolated with MylarStrip. (Fig. 4). (Fig. 5).

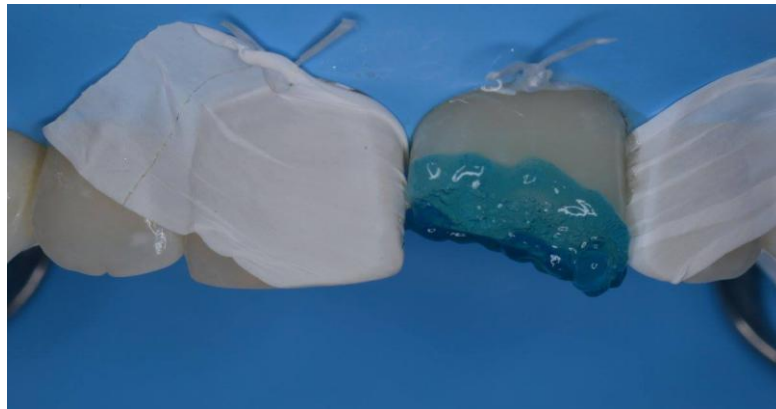


Figure-2: Etch the tooth



Figure-3: Bonding agent

After 1 week, during the finishing stage the contouring and gross reduction of the composite resin was performed with the help of variety of burs and diamond points. A composite finishing and polishing kit was also used for this purpose. In this case incisal edge was established with ultrafine polishing disc. Once the restoration was refined a final polishing was done with the polishing points. (Fig. 6).



Figure 4: Incisal enamel shape was inserted



Figure 5: The A2 composite resin increment was inserted to reproduce the dentin (Premise-Kerr) and mammelons region was performed

II. Discussion

The search for natural esthetics and the evolution of adhesive techniques assured the opportunity to obtain long-term functional and esthetic results.[4-6] There are different alternatives for clinical management of problems related to the shape, position, symmetry; proportion, texture and color of the anterior teeth.[7,12] These features can be easily evaluated from the initial photo and from a study model for planning case. (Fig. 7). (Fig. 8).

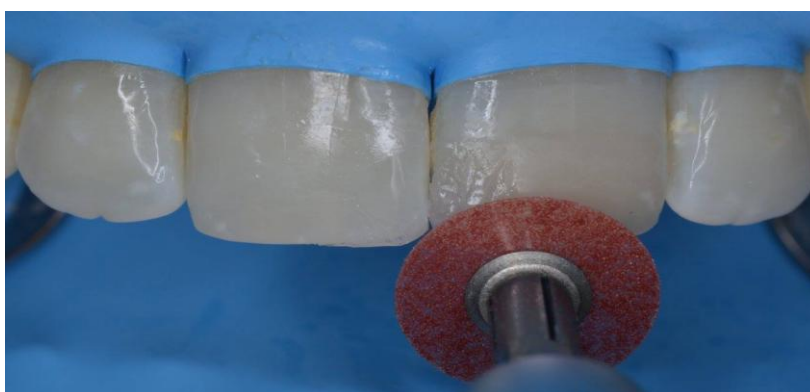


Figure-6: The restoration surfaces were polished with finishing discs

The composite resins provide satisfactory treatments results for even young and adult patients, but it is indicated to adults when the volume, length or number of composite restorations is limited.[8] This study presented a young patient with good results using only composite resins.[13,14] Initial planning is essential for the best esthetic and functional results from restorative procedures. The use of some planning strategies enables greater dental structure preservation and result predictability. .[15,16] The choice of resin composite should be focused on aspects related to the strength and aesthetics. Within this context, the composite layering is the key to obtaining esthetically successful restorations.[16] According Nahsan et al.,[17] young teeth show a naturally high value and thus require resins with such characteristics; in consequence, the reproduction of enamel should be done with composite resins that presents transparent characteristics.[19,20] In the present case, the location and aspect of the fracture combined with a balanced occlusion may have favored the clinical success. Limitations of the adhesives restoration techniques can be attributed to detachment of the restoration by a new trauma or the restoration does not recover its original color. With regard to the



Figure 7: Final view of restoration



Figure 8: Final view of restoration

Restorative procedure, the applied technique has facilitated the obtaining of dental contours and convexities, which would be more labored and lengthy in a direct restorative technique. If handled properly, prognosis of the tooth, after traumatic crown fracture, is satisfactory.[18]

III. Conclusion

Composite resins remain one of the most important tools in the clinician's armament. Such systems can provide reliable strength and a realistic aesthetic result. The advantage of this technique is closely associated with satisfactory results, combined with the dexterity, skill and mastery of technique employed by the professional.

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