



# Anterior Esthetic Restorations Using Direct Composite Restoration; a Case Report

**Abdulgani Azzaldeen<sup>1</sup>, Watted Nezar<sup>2</sup>, Abu-Hussein Muhamad<sup>\*2,3</sup>**

<sup>1</sup>Department of Conservative Dentistry, Al-Quds University, Jerusalem, Palestine

<sup>2</sup>University Hospital of Würzburg, Clinics and Policlinics for Dental, Oral and Maxillofacial Diseases of the Bavarian Julius-Maximilian-University Wuerzburg, Germany Triangle R&D Center, Kafr Qara, Israel, Department of Orthodontics, Arab American University, Jenin, Palestine

<sup>3</sup>Department of Pediatric Dentistry, 123 Argus Street, 10441 Athens, Greece

**\*Corresponding author:** Dr. Abu-Hussein Muhamad, Department of Pediatric Dentistry, 123 Argus Street, 10441 Athens, Greece, Email: abuhusseinmuhamad@gmail.com

**Received Date:** April 22, 2019; **Published Date:** April 26, 2019

## 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. This paper reports a case of a permanent maxillary central incisor with incisal crown fracture treated using composite resin restoration.

**Keywords:** Fractured teeth; Composite resin; Class IV; Aesthetic

## Introduction

Coronal fracture of anterior teeth is an important topic for esthetic dentistry [1]. Such fractures may jeopardize esthetics, function, tissue biology and occlusal physiology, thus endangering tooth vitality and integrity. Coronal fractures resulting from dental trauma most frequently occur to the maxillary anterior teeth of adolescents and less frequently to mandibular teeth. Adult teeth may also suffer traumatic fracture, although less frequently than for adolescents. [1,2,3]. Direct and indirect restorations are clinically successful treatment options for fractured anterior teeth. [4]. Direct restorations are performed

without laboratory phases. They usually involve enamel/dentin acid-etching techniques with adhesive systems and one or more types of resin composites [5]. Indirect restorations

Require multiple visits and expense due to laboratory procedures. Resin composites, porcelain and metalceramics are materials from which a practitioner can choose to perform these anterior tooth restorations [6]. These restorations can be bonded to teeth via enamel/dentin acid-etch techniques and resin adhesive systems [5-7]. 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.

(3) Traumatized anterior teeth require quick functional and aesthetic repair.

(4) The presence of fracture of anterior tooth severely compromises the aesthetic value of the patient. [9,10]. 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 [9,10]. 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 [11,12,13].

This paper reports a case of a permanent maxillary central incisor with incisal crown fracture treated using composite resin restoration.

### Case report

A 9-year-old male patient was referred to the dental clinic of our institution, reporting a dental trauma of the permanent maxillary right central incisor. Dental history revealed that he had a trauma as the result of a fall while playing at school. The patient reported no treatment until that moment, and the crown fragment had been lost during the accident. The position and pattern of the fracture suggested that a composite resin restoration would be a reliable option for the case. The patient was systemically healthy, presented an overall plaque index and gingival index of below 20%, and the operative area was free from visible plaque. The intraoral and radiographic examination showed that the injury had caused a non-complicated crown fracture in the incisal third of the tooth 11, without pulp exposure (Figure1). Clinical examination evidenced fracture involving only the enamel aspect with no symptoms. The coronal analysis of the adjacent central incisor showed incisal edge fracture (Figure 2). Which had already been provisionally restored with composite resin.



Figure 1: Pre-operative view.



Figure 2: Pre-operative view.

The first stage of the restorative procedure was the realization of an aesthetic simulation or mock-up with the restorative material to be used, defining the choice of color. Next step was to perform an impression of the dental arcade to obtain a model of gypsum (Figure 3-5). The desired shape of the fractured tooth was waxed-up on the model of gypsum, and a silicone matrix was made to accurately reproduce its palatal anatomy and incisal edge (Figure5). After dental prophylaxis and cleaning the tooth, the operative field was isolated. Briefly, the provisionally composite resin of the tooth 21 was removed, and the both central incisors were acid etched for 30 s with a 35% phosphoric acid gel, rinsed for 30 seconds, and dried with air spray (Figure 4). Then, a conventional



Figure 3: Preparation of the tooth structure.



Figure 4: Etch the tooth.



Figure 5: Bonding agent.

Two bottle adhesive system (was applied on enamel and light-cured for 40 s buccally and 40 s lingually by using a halogen light-curing equipment with an intensity of 1400 mW).

The restoration was initiated with a small amount of composite A2E in the portion corresponding of the palatal aspect in the silicone matrix (Figure 6). The adaptation of the composite resin in the silicone matrix was performed with a brush n. 3 and then, the silicone matrix was positioned on the patient and initiated the polymerization of the composite resin. After removed the silicone matrix, we observed the perfect palatal shape and contour obtained and then proceeded to insert the composite corresponding to the dentin portion and after the opalescent halo. The last layer of composite resin A3E corresponding to buccal enamel was applied and smoothed with brushes for an excellent accommodation and surface texturization (Figure 7 and 8). The final polishing was performed with a high-luster polishing paste at external enamel surface (Figure 9-12). Ten months after the adhesive procedure revealed periodontal health and no painful symptomatology (Figures v13). A good aesthetic appearance and function were observed, and a frontal smile view shows a satisfactory procedure.



Figure 6: Incisal enamel shape was inserted.



Figure 7: Incisal enamel shape was inserted.



Figure 8: The A2 composite resin increment was inserted to reproduce the dentin and mammelons region was performed.



Figure 9: Final layer, Color intensifiers.



Figure 10: Facial layer placed and transitional line angles marked.



Figure 11: Correct length and contours established on tooth 8.



Figure 12: The restoration surfaces were polished with finishing discs.



Figure 13: Final view of restoration.

## Discussion

Dental trauma occurs most frequently to the maxillary central incisors, and the fracture zone may involve both enamel and dentin. The current case offers a conservative, time saving, inexpensive treatment option of a common type of esthetic problem following dental trauma [14,15].

The composite resins provide satisfactory treatments a result for even young and adult patients, but it is indicated to adults when the volume, length or number of composite restorations is limited [6]. This study presented a young patient with good results using only composite resins. [12,13]. 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 [14,15]. 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. [15]. According Nahsan et al., [16]. 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 [15,17]. With regard to the 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 [17-20].

In patients with worn dentition, satisfactory results were reported with anterior composites offering a cost effective treatment alternative where esthetics is a major concern [2-4]. With further improvements in bonding chemistry, the success Rate of composites is speculated to improve. A good polishing system including polishing paste, cups and wheels is recommended to achieve appropriate luster. A regular charmois brush with polishing paste can be used for obtaining final luster [2,5].

In the present case, the location and aspect of the fracture combined with a balanced occlusion may have favored the clinical success [14]. 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 [15,16]. With regard to the 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 [15]. If handled properly,

prognosis of the tooth, after traumatic crown fracture, is satisfactory [17].

Direct composite veneers are indicated for esthetic rehabilitation in these cases because of conservative tooth preparation and because they can be completed in single appointment, frequency of replacement or repair is less, they are strong and durable, no luting agent is required, and it is cost-effective. In addition, they have similar abrasion rates as that of natural tooth structures [15-18]. Direct restorative procedure was presented as an effective and safe alternative for oral rehabilitation [19,21]. Many factors, such as planning stage, knowledge and mastery of technique and finish and polishing materials decide the success of the restorations; monitoring and maintenance ensure the treatment longevity [20,21].

## Conclusion

The composite resin restoration of permanent incisors with crown fractures is a simple procedure that should be planned and executed with attention to dental contours and convexities, facilitating the re-establishment of function and aesthetics.

## References

1. Andreasen JO, Andreasen FM, Andersson L (2007) Textbook and color atlas of traumatic injuries to the teeth. 4th ed. Copenhagen, Denmark Blackwell Munksgaard.
2. Nathanson D (1991) Current developments in esthetic dentistry. *Current Opinion in Dentistry* 1(2): 206-211.
3. Fahl N Jr (2000) Achieving ultimate anterior esthetics with a new microhybrid composite. *Compendium of Continuing Education in Dentistry* 21(26): 4-13.
4. Haesman P (2008) Master Dentistry Restorative dentistry and orthodontics. Elsevier Health Science pp 182-183
5. Abu- Hussein Muhamad Abdulgani Azzaldeen, Watted Nazer (2019) Restoring Fractured Anterior Tooth Using Direct Composite Restoration: A Case Report. *Global Journal of Dental Sciences* 1:1
6. Abdulgani Azzaldeen, Abdulgani Mai, Abu-Hussein Muhamad (2017) Fractured Anterior Tooth Using Direct Composite Restoration: A Case Report. *IOSR Journal of Dental and Medical Sciences* 16(10): 61-65
7. Hugo B (2009) Esthetics with Resin Composite: Basics and Techniques. Quintessence Publishing Co Limited ISBN 9781850971832.
8. Abu-Hussein M, Abdulgani Az, Ziyad M, Watted N (2016) Autogenous Tooth Fragment Reattachment A 12 -Years Follow-Up. *Journal of Dental and Medical Sciences* 15(4): 85-90
9. Abu-Hussein Muhamad , Nazer Watted , Azzaldeen Abdulgani , Mai Abdulgani (2016) Prevalence of Traumatic Dental Injury in Arab Israeli Community. *Journal of Dental and Medical Sciences* 15(7): 91-98.
10. Abu-Hussein Muhamad, Abdulgani Azzaldeen, Abdulgani Mai (2015) Step-by-Step Approaches for Anterior Direct Restorative. *Int J Dent Health Sci* 2(6): 1305-1310
11. Dale BG, Ascheim KW (1993) Esthetic Dentistry A Clinical Approach to Techniques and Materials. London and Philadelphia Lea and Febiger 105(1): 510-1178.
12. Touati B, Miara P, Nathanson D (1999) Esthetic Dentistry and Ceramic Restorations. Martin Dunitz ISBN 9781853171598.
13. Chiche GJ, Pinault A (1994) Esthetics of Anterior Fixed Prosthodontics. London Quintessence Publishing Co Limited ISBN 9780867152586.
14. Muhamad Abu-Hussein, Nazer Watted, Azzaldeen Abdulgani (2015) Gummy Smile and Optimization of Dentofacial Esthetics. *Journal of Dental and Medical Sciences* 14(4): 24-28.
15. Abu-Hussein Muhamad, Abdulgani Azzaldeen, Abdulgani Mai (2016) Esthetics of Class IV Restorations with Composite Resins. *Journal of Dental and Medical Sciences* 15(1): 61-66.
16. Abu-Hussein Muhamad, Watted Nazer, Abdulgani Azzaldeen (2015) the Curve of Dental Arch in Normal Occlusion. *Open Science Journal of Clinical Medicine* 3(2): 47-54.
17. Baratieri LN, Monteiro S Jr, Andrada MAC (1998) Esthetics direct adhesive restorations on fractured anterior teeth. Chicago Quintessence Books p 30-32.
18. Abu-Hussein M, Watted N, Abdulgani A, Abu-Shilabayeh H (2015) Anterior Dental Esthetics in Primary Teeth. *International Journal of Public Health Research* 3(1): 25-36.

19. JR Pinkham, PS Casamassimo, HW Fields DJ, McTigue and A J Nowak (2005) Pediatric Dentistry Infancy through Adolescence ISBN: 9780323079082.
20. Jordan RE (1993) Esthetic Composite Bonding Techniques and Materials, Mosby-Year book.
21. Hunaid Arif Merchant, Swati Sharma, rikhita Devanathan, Mithra N Hegde (2018) Anterior Esthetic Restorations Using Direct Composite Restoration And All Ceramic Veneers - 2 Case Reports. International Journal of Advanced Multidisciplinary Scientific Research 1(3)9-14.