Gavin Publishers
Dentistry: Advanced Research
Volume 1; Issue 02
Korkut B and Yılmaz Atalı P
ISSN: 2574-7347

Case Report

Simulating Natural Dental Outlook in Esthetic Dentistry: A Case Report

Bora Korkut*, Pınar Yılmaz Atalı

Department of Restorative Dentistry, Faculty of Dentistry, Marmara University, Istanbul, Turkey

***Corresponding author:** Bora Korkut, 1Department of Restorative Dentistry, Faculty of Dentistry, Marmara University, Istanbul, Turkey, Tel: +90 5325911560; E-mail: bora.korkut@marmara.edu.tr

Citation: Korkut B, Yılmaz Atalı P (2016) Simulating Natural Dental Outlook in Esthetic Dentistry: A Case Report. Dent Adv Res 1: 110. DOI: 10.29011/2574-7347.100010

Received Date: 15 July, 2016; **Accepted Date:** 05 August, 2016; **Published Date:** 19 August, 2016

Abstract

Aesthetic dentistry is concerned not only with the dental appearance but also the enhancement of a person's smile. Creating a natural dental outcome harmonious with adjacent teeth is the main aim of aesthetic dentistry. A good observation, knowledge of dental anatomy and dental materials are required for this. Today's cosmetic dental treatments are more durable and predictable than before with the technological advancements in natural-looking, tooth-colored dental materials. Additionally, more conservative techniques are being used in order to mimic natural dental tissues, depending upon patients' specific clinical situation. These kinds of procedures can be held in a single visit by using aesthetic dental resins mostly without any preparations. This makes direct aesthetic dental rehabilitations such as smile designs more comfortable and convenient for the patients.

In this case reporta patient with dental aesthetic problems due to crown fractures on maxillary centrals, treated with direct aesthetic composite resin restorations in one appointment.In one-year recall, no discolorations, fractures, secondary caries or soft tissue pathologies were detected and the restorations were almost undetectable resulting in an aesthetic outlook. In conclusionit is considered that natural looking, functional, tooth-colored, seamless, long lasting and aesthetic restorations can be created by using direct aesthetic composite resinsthat may satisfy the patients' demands.

Keywords:

Cosmetic Dentistry; Crown fractures; Dental aesthetic; Direct composite resins

Introductıon

Cosmetic dentistry is concerned with the appearance of teeth and the enhancement of a person's smile [1]. Creating natural tooth contours and emergence profiles in aesthetic dentistry is a key challenge in producing a seamless restoration that is harmonious with the adjacent teeth [1,2]. This requires a good eye, a thorough understanding of dental anatomy and a mastery of dental materials. Cosmetic dentistry primarily focuses on improvement dental aesthetics in color, position, shape, size, alignment and overall smile appearance [1]. Technological advancements in natural-looking, tooth-colored dental materials make today's cosmetic dental treatments more durable and predictable than before [2]. Additionally, dentists are now using more conservative aesthetic dentistry techniques to preserve as much of your natural tooth structure as possible, depending upon your specific clinical situation [3,4]. This makes aesthetic dental procedures such as smile designs more comfortable and convenient for the patients [1,3,5]. Direct resin restorations may improve dental outlook if there are excess spaces between the teeth or if they are chipped, broken, stained, or cracked [4-6]. These kind of procedures can be held in a single clinic visit by applying an adhesive system and an aesthetic tooth-colored resin materials directly to the tooth's surface [4,7,8].

This report describes direct aesthetic approach in treating crown fractures by usingcomposite resinsin order to maintain a natural dental outlook.

Case Report

In this case report an 18-year old male patient with incisal crown fractures on maxillary central incisors applied to the clinic with aesthetic problems. There was cavity free white spot lesions on maxillary left central and right lateral incisors. Because of the patient's negative attitude the white spot lesions were decided not to be treated but to be monitored. Surface grooves, incisal notches and slight deviousness between the central incisors were also detected.The fractured teeth were asymptomatic and according to the anamnesis, they were broken 8 years ago because of an acute trauma (Figure 1).

Figure 1: Incisal crown fractures on teeth #11 and #21.

The patient's oral hygiene was in good condition, there was no signs of a periapical lesion in radiographical examinations and also both teeth were vital according to theelectrical pulp test. Considering that the patient was young and for a more conservative approach, direct partial aesthetic composite resin restorations for both teeth were decided as the treatment plan.

Firstly, shade selection was considered as A1D and A1E (Clearfil Majesty Es-2 Premium, Kuraray, Japan) by creating composite dots on a tooth and image processing on the photos taken in daylight (Figure 2).

Figure 2: Shade selection with "Composite Dots Technique".

The teeth were isolated with rubber dam (OptiDam, Kerr, USA) and gingival barrier (Beyond) (Figure 3).

Figure 3: Rubber dam and gingival barrier isolation.

Irregular bevelings were prepared by using a green-banded diamond burr (Acurata, Japan) on incisal labial enamel. In order to enhance the retention, 37% phosphoric acid (Etching Gel, Kerr, USA) was applied to the enamel surfaces for 15 seconds, washed by water spray and slightly dried by air spray (Figure 4).

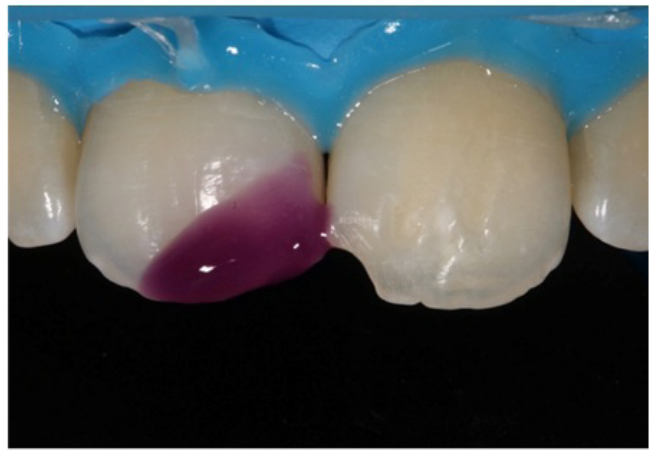

Figure 4: Application of phosphoric acid.

Then a single bottle bonding agent (Adper Single Bond, 3M ESPE, USA) were applied on prepared surfaces and polymerized for 20 seconds with a led light generator with intensity of 1,000mW/cm^2 from ~3mm distance to the surface of the restoration (Demi Led Light Curing System, Kerr, USA). A1E transparent shade was applied slightly as first layer and palatal wall. A1Dbody shade was applied on the first layer leaving ~1 mm as a more opaque shade(Figure 5).

Finally A1E transparent shade was applied as the top labial layer by using a composite brush and composite primer as lubricant (Composite brush, Composite Primer; GC, Japan). While applying the last composite layer the surface grooves, incisal notches for both teeth were simulated by using the brush in order to create a natural outlook. Also the slight deviousness between the teeth was simulated. Each layer was polymerized for 40 seconds (Figure 6).

Finishing and polishing procedures were achieved by using polishing discs (OptiDisc, Kerr, USA) for contact areas and spiral polishing discs (Twist Dia, Kuraray, Japan) for labial

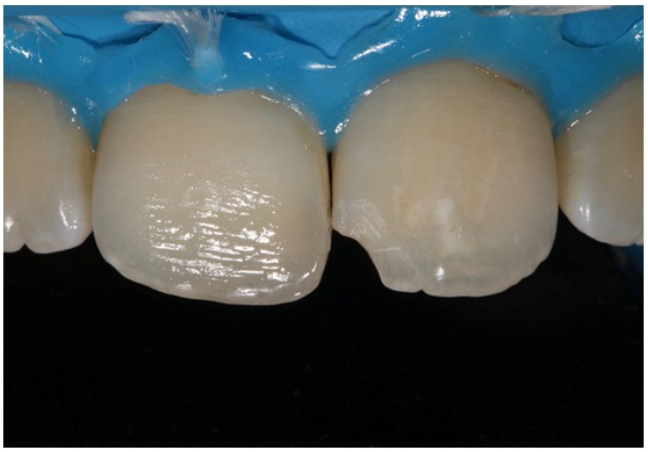

Figure 5: Application of A1D body shade as middle layer.

Figure 6: Surface grooves, incisal notches and deviousness were simulated.

and palatinal surfaces with low speed handpiece in dry conditions (DURAtec 2068D, Germany) (Figure 7).

Figure 7: Finishing and polishing.

Patient was advised not to eat any colorant dietary for 24 hours, motivated for oral hygiene and informed for recalls (Figure 8).

At 1-year recall, no fractures, sensitivities, discolorations or secondary caries were detected on the teeth and restorations. The surrounding soft tissues were also healthy. The patient had good oral hygiene and the restorations were almost undetectable as having an aesthetic outlook (Figure 9). Etirely satisfactory restorations were placed in category Alpha (A) according to the Modified USPHS Criterias [9].

Figure 8: Final restorations.

Figure 9: One-year recall.

In conclusion it is considered that natural looking, functional, tooth-colored, seamless, long lasting and aesthetic restorations can be created by using direct aesthetic composite resins that may satisfy patients' demands.

Discussion

Creating natural dental outlook in cosmetic dentistry is an important challenge in today's dentistry [1]. Recent advancements in composite resin materials may provide some solutions to some demands such as being aesthetic, economical, functional, long lasting and less time consuming in dental clinic. However there is still no restorative material that fulfills all the demands for now [2,10]. Dentists now prefer more conservative aesthetic dentistry techniques to preserve more natural tooth structures as possible, making aesthetic dental procedures such as smile make-over's as more convenient treatment options [3-7]. In this regard direct composite resin restorationsare one of the best options [11-13]. Single visit application, no need for preliminary models or wax-ups,no need for a techician and therefore laboratory fees that increase the costs, ease of repair and obtaining superior functional and aesthetic results are the main advantages of direct composite resin restorations. They are also kinder to the opposing dentition compared to older feldspathic porcelains [2,5,14]. However still many composite materials possess less fractural toughness, shear and compressive strength resulting in not being ideally

suitable for high-stress areas [15-17]. Also the main disadvantage of direct resin restorations can be described as discoloration [16]. But this negativeness can be fixed with accurate finishing and polishing procedures and regular recalls [5]. In the presence of some parafunctional habits such as bruxism and nail biting, which may potentially jeopardize the longevity of direct composite restorations which is at the same rate for indirect ceramic alternatives [16,17]. In this case the shade selection was achieved by using composite dots and image processing of the digital photographs of them. Firstly, photo was changed to black and white in color. Then for enamel shade the light was decreased and for dentin shade light was increased and contrast was decreased. The aim of this technique was to minimize the factors that may effect the objective decision of the shade such as operator making process, daylight ratio and patient's position [18,19]. In the report presented although it isnot a long-term to evaluate, patientat 1-year recall demonstrated no discolorations which is important for the composite resin restorations. Also no sensitivities or fractures were detected at the recalls although the restorations of the crown fractures were complex. Probably the adaptation of Clearfil Majesty Es-2 Premium composite resin (Kuraray, Japan) used in the case waswell and carefully performedfinishing/polishing procedures by using spiral discs resulted in smooth and sound surfaces. The case selection as having an ideal occlusal pattern could also positively affect the longevity of the restorations located at the critical areas like incisal edges so that creating no devastating forces on the restorations.

In conclusionthe case selection is very critical for anterior complex restorations before deciding to use direct composite resins [5,15]. Cases should be analysed with all detailes in order to create successful, functional, long lasting, and aesthetic restorations and as well as to satisfy patient's demands [2,17]. As a result direct composite resin restorations, with accurrate case selection, technique, materials and a well-experienced operator, can yield esthetically satisfying and long lasting results under the conditions of the case presented.

References

1. Maihofer MG (2009) Cosmetic dentistry is not a recognized specialty. J Mich Dent Assoc 91: 18.
2. Schmidt CJ, Tatum SA (2006) Cosmetic dentistry. Current Opinion in Otolaryngology & Head & Neck Surgery14: 254-259.
3. Dietschi D (2001) Layering concepts in anterior composite restorations. J Adhes Dent 3: 71-80.
4. Grauer D, Heymann GC, Swift EJ Jr (2012) Clinical Management of Tooth Size Discrepancies. J Esthet Restor Dent 24: 155-159.
5. Hickel R, Heidemann D, Staehle HJ, Minnig P, Wilson NH (2004) Direct composite restorations extended use in anterior and posterior situations. Clin Oral Invest 8: 43-44.
6. Terry DA, Leinfelder KF (2004) An integration of composite resin with natural tooth structure: the Class IV restoration. Pract Proced Aesthet Dent 16: 235-242.
7. Qualtrough AJ, Burke FJ (1994) A look at dental esthetics. Quintessence Int 25: 7-14.
8. De Araujo EM, Fortkamp S, Baratieri LN (2009) Closure of Diastema and Gingival Recontouring Using Direct Adhesive Restorations: A Case Report. J Esthet Restor Dent 21: 229-240.
9. Ryge G, Snyder M (1973) Evaluating the clinical quality of restorations. J Am Dent Assoc 87: 369-377.
10. Jordan RE, Suzuki M (1992) The ideal composite material. J Can Dent Assoc 58: 484,487.
11. Leinfelder KF, Sluder TB, Sockwell CL, Strickland WD, Wall JT (1975) Clinical evaluation of composite resins as anterior and posterior restorative materials. J Prosthet Dent 33: 407-416.
12. Zorba YO, Ercan E (2008) Direkt uygulanan kompozit laminate veneerlerin klinik değerlendirilmeleri: iki olgu sunumu. SÜ Dişhek Fak Derg 17: 130-135.
13. Türkün LS (2005) Conservative restoration with resin composites of a case of amelogenesis imperfecta. Int Dent J 55: 38-41.
14. Lavigueur C, Zhu XX (2012) Recent advances in the development of dental composite resins. RSC Adv 2: 59-63.
15. Jordan RE (1993) Esthetic Composite Bonding Techniques and Materials. St. Louis, Mosby-Year Book, Inc. 2nd ed. p: 84-86,132-134,140,150.
16. Stappert CF, Ozden U, Gerds T, Strub JR (2005) Longevity and failure loadofceramic veneers with different preparation designs after exposure to masticatory simulation. J Prosthet Dent 94: 132-139.
17. Hemmings WK, Darbar UR, Vaughan S (2000) Tooth wear treated with direct composite restorations at an increased vertical dimension: Results at 30 months. J Prosthet Dent 83: 287-293.
18. Baharin SA, Dong TY, Jing TW (2013) Anterior Tooth Shade Selection Procedure: Influence of Light Sources and Patient's Position. Sains Malaysiana. 42: 7-11.