

## **Esthetics of Class IV Restorations with Composite Resins**

**Dr. Abu-Hussein Muhamad\*, Dr. Abdulgani Azzaldeen , Dr. Abdulgani Mai**

*Al-Quds University, School of Dentistry, Jerusalem, Palestine*

### **Corresponding Author;**

Dr. Abu-Hussein Muhamad

DDS, MScD, MSc, MDentSci (PaedDent) , FICD

123 Argus Street

10441 Athens, Greece

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**Abstract:** *This paper aims to submit the report the aesthetic correction in a disharmonious smile and unsatisfactory composite restorations in anterior teeth who were treated with direct aesthetic restorative procedure. The results show the use of this technique to allows an immediate aesthetic quality, directly and inexpensively restoring the natural features of the smile.*

**Key words:** *Composite Resin, Class IV, Aesthetic.*

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### **I. Introduction;**

Direct composite resins have the potential to offer a reasonably predictable alternative to amalgam and other metal-based restoratives. This assumes they are utilized in the appropriate clinical situation and are properly placed. In fact, the increasing demand for tooth-colored restorations, conservation of tooth structure, and cosmetic dental procedures has encouraged the widespread placement of direct composite restorations. [1,2,3]

The greater level of clinical success with direct composites is most likely related to material developments, improved clinical skills and techniques, and dramatic advances in adhesive technology.5 Since the use of directly placed composites is a mainstay in the majority of restorative practices, it is imperative that dentists understand the rationale for specific clinical techniques, as well as material idiosyncrasies, in order to optimize the adhesive interface between the composite restorative and the tooth substrate. [3]

Since 1955 with the discovery of etching proposed by Buonocore et al. [4], to this day there was a breakthrough in adhesive dentistry that brought the opportunity to the members of the profession can perform restorative treatments more conservative and aesthetic. It is indeed the concern with the appearance and the need that people have a harmonious smile. An aesthetic and healthy standard is closely related because there is no beauty without health, ie, satisfy anyone, regardless of sex, age or social class [5]. And reaffirmed in working Reston [6] said that the origin of demand for aesthetic, has three main factors: globalization standards of beauty the evolution of materials and techniques, and speed in the disclosure and dissemination of scientific knowledge. Over the past 44 years, since the introduction of composite resin. Researchers at the dental industry have made many improvements in composites [7].

The evolution of adhesives and light-cured composite resins has provided the realization of adhesive restorative procedures less invasive and with excellent cosmetic results [8]. Among these bonding procedures, is making direct facets in composite mresin, which consists of applying and sculpting, texturing and characterization of one or more layers of this material on the labial surface of the dental element. [9]

The success in restoring teeth within the aesthetical zone results in positive effect on patient's self-esteem and quality of life [3]. The wishes and needs of patients have to be considered in the same way as esthetic guidelines known from the scientific literature [4].

Esthetic dentistry requires minimally invasive treatments with restorations that mimic the surrounding dentition [10,11,12]. The direct composite resin layering techniques allow greater preservation of sound tooth structure than indirect restorations. The main difficulties encountered by clinicians, have involved contamination due to improper isolation, individual patient characteristics, and the provision of restorations with acceptable strength, durability, and esthetics [13,14].

Composite resin has become an integral part of contemporary restorative dentistry and the material of choice for Class IV restorations due to improvements in materials, conservative concepts in restorative dentistry and clinical successes [15].

The present report will describe a systematic and troubleshooting approach to rebuild the lost anatomy of a maxillary central incisor. The step by step procedure explained in the following case represents the systemic approach routinely used by the author for classIV buildups.

## **II. Case Report**

A 28 years old male was referred to the my dental clinic e presenting esthetic requests in the maxillary central incisors.

Following the medical interview and data collection of general and oral health, clinical and radiographic examinations were conducted. A photographic protocol was set for assist the planning and execution of the case.

In the clinical examination, facial aspects, smile, gingival architecture and dental characteristics were analyzed. In the right maxillary incisor, extensive carious lesion was observed with involvement of the mesial side and the all three thirds of the dental element, featuring a class IV cavity. The left maxillary incisor presented an extensive composite resin restoration showing rough aspect and color change (Figure 1). Radiographically, there was a radiolucent area on the proximal surfaces (Figure 2).

The clinical planning suggested direct composite restorations for both maxillary central incisors.

In the following appointment, the initial shade was measured with the aid of a VITA shade guide . Then increments of composite were placed on the buccal surface of the shade in the middle third, to ensure the correct shade measurement.

Rubber dam isolation was performed then the restoration was removed with a diamond bur No. 1014, 21 and the infected dentin exposed. The infected dentin was removed with carbide bur # 6 at low speed . A bevel on the buccal surface was made with a tapered bur No. 2200 .

Due to a thin remaining dentin, calcium hydroxide cement based was inserted in the pulpal wall of each element as a protective agent for the pulp-dentin complex. Glass ionomer cement was applied over the calcium hydroxide cement, acting as cavity base.

The surfaces were treated according to the total-etch technique, 37% phosphoric acid for 30 s (enamel) and 15 s , rinsed for 20s, dried by air spray and excess water was removed with absorbent paper. The adhesive was applied with disposable tips , followed by air spray to evaporate the solvent and 10 s photo activation (Figure 3).

A polyester strip was placed between the dental elements to separate and assist in the restoration of the lingual face of both elements.

Increments of enamel shade composite AT, (Figure 4) were placed for rebuild the lingual enamel, first in the right incisor, and photo activated by time of 20 seconds. The same protocol was followed in the left incisor. Layers of dentin shade composite, A3D and body shade A2B were applied and light cured for 20 seconds. Resin effect shade BT , were placed between the incisal edge and dentinal mammelons in order to reproduce translucency and opalescence of this region. An enamel shade composite A2E was placed as the last increment (Figure 5) . Glycerin based gel was placed on the surface of composite resin for better conversion degree of monomers and the set was photo activated for 20 seconds. The gel was rinsed and the surface was air-dried.

The rubber dam was removed, and the oclusal adjustment performed with fine and extra-fine flame-shaped diamond burs, 3168 F and 3168 FF . Restoration's finishing and polishing were performed for dental contouring regularization; sanding discs Sof-Lex Pop-On were employed followed by multilaminate burs on the buccal surface for smoothing resin. Abrasive silicone based rubbers were used for surface smoothness. Buccal characterizations (primary and secondary anatomy) were prepared with a diamond bur at high speed no 3195 (Figure 6).

## **III. Discussion**

Composite restorations offer a cost effective treatment alternative where esthetics is a major concern. The survival rates of these anterior composites were reported to be extremely satisfactory even in patients with worn dentition. With improvements in the bonding chemistry and introduction of nano-composites, it is speculated that the success rate of composites will improve even further.[16]

With the selection of color, we used a body resin to simulate the effects of dentin, and associated with this if we used the hue enamel and was varied in various color saturation (chroma) to be able to play more naturally to dental element, it is known that resins are monochrome while the teeth are polychromatic . The use of an enamel resin in the first and last layer is due to the fact that this has a higher surface smoothness after finishing and polishing, which gives the largest aesthetic restoration, hindering the buildup of plaque in the cervical region, this smoothness avoids injuries to the periodontium. This is true in nano hybrid resins that have a similar polishing the microparticulated .

Discolouration is still a significant clinical problem with the resin composite materials, and esthetic failure is one of the most common reasons for the replacement of restorations. [17] Studies have demonstrated that light-cured composite resins are more wear-resistant and more color-stable than the self-cured composite resins,[18] which suggests that the degree of conversion plays an essential role in the color stability of these materials.[19] There are many factors linked to the discolouration of materials in the oral

environment.[20]Composite resins have a variety of organic components that may cause intrinsic discoloration, and the discoloration of the deep layers of the composite may occur due to physicochemical reactions of the material itself, such as those that occur with tertiary amines and may cause composites to become yellowish. Composite yellowing could be caused by the aliphatic amines, which are important collaborators of the photo-initiators in the curing process of the composite. It is acknowledged that amines are capable of forming by-products during light-curing reaction, which tend to make the material yellowish or brownish under the influence of light. [17,18]

External discoloration is usually superficial and is associated with restoration roughness. However, water-soluble stains can discolor composite throughout a resin matrix. This is usually attributable to chemical degeneration of the filler–resin bond and solubility of the resin matrix.[21] The structure of the composite and the characteristics of the particles have direct effects on surface polishing and on the susceptibility to extrinsic staining.[22] Restoration polishing is particularly important in order to delay the discoloration and aging processes of the composite, because higher smoothness and less porosity reduce the adherence of agents responsible for changing the color of composites, such as dental biofilm, food colourants, tobacco, and others.[23]Oral habits such as tobacco use and certain dietary patterns (for example, caffeine intake) may exacerbate the external discoloration of composite materials.[24]

Mjör reported that, the relatively high proportion of margin discoloration suggests inadequate acid-etching of the enamel prior to placing the resin-based composite restorations, and/or inadequate fabrication of the restoration in addition to the inherent problems associated with polymerization shrinkage. [25]

The increase in etched surface area results in a stronger enamel to resin bond, which increases the retention of the restoration and reduces marginal leakage and marginal discoloration.[25]

In the reported case, the maxillary central incisors had inadequate restorations, besides the presence of active caries lesion compromising health, function and esthetics.

Direct restorative procedure was presented as an effective and safe alternative for oral rehabilitation. 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.

#### **IV. 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.

This concluding part presented a means for restoring a Class IV/direct veneer defect in the aesthetic zone.

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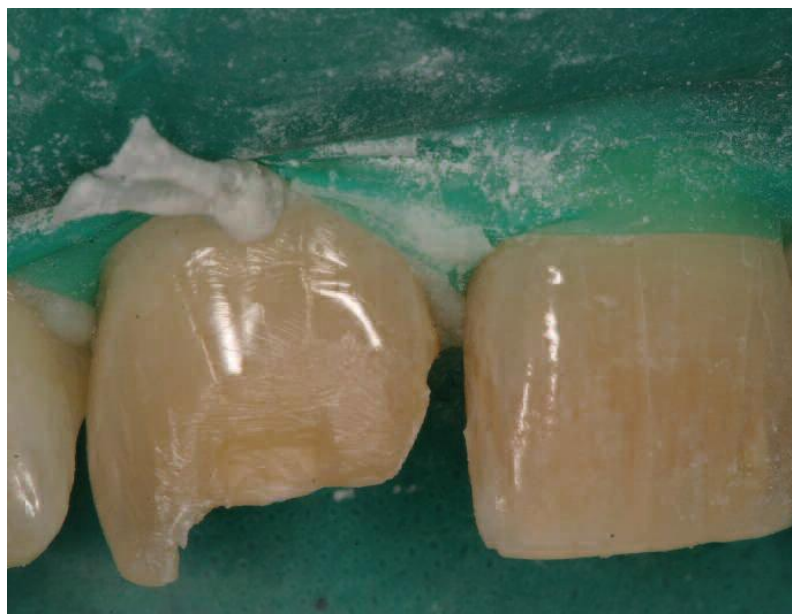
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**Legendes**



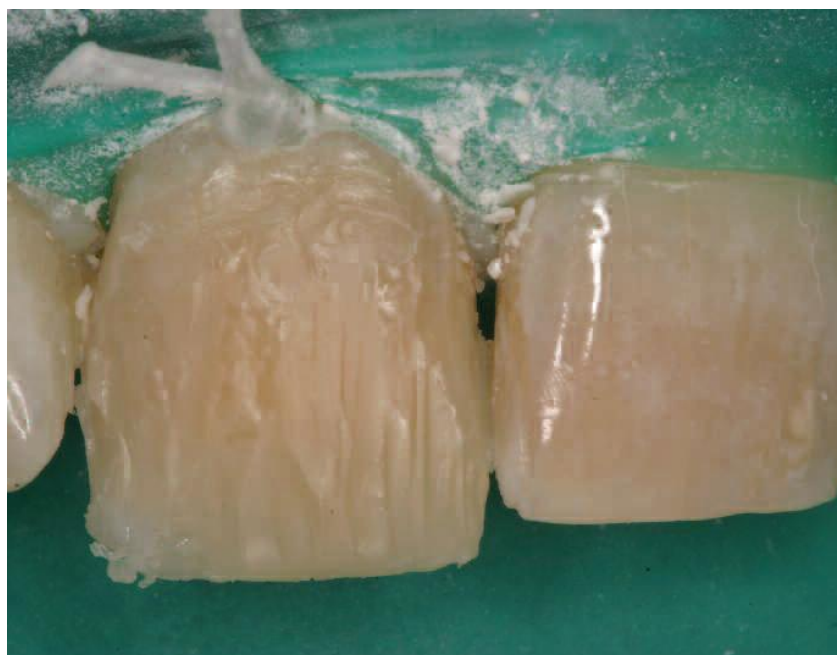
**Figure 1. Pre-op smile, Close up of discoloured restoration**



**Figure 2. Bevel placed**



**Figure 3. Occlusal white composite placed in matrix.**



**Figure 4. Microfill placed**



**Figure 5. Incisal light microfill applied**



**Figure 6. Final close up of finished restoration**