

# Composite Veneers in Restorative Dentistry, Prosthodontics, and Endodontics

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**Abstract:** The objective of this article was to review the current literature covering composite veneers and their uses in the main three following branches; (restorative dentistry, prosthodontics, and endodontics). A comprehensive review of the literature was conducted through electronic databases such as; PubMed/Medline, Embase, and Google scholar, searching evidence for restoration treatment using composite veneers in prosthodontics and endodontics published up to July, 2017. In former aesthetic issues it's essential to comprehend the etiology of the discoloration: in the case provided the harsh products of the busted instrument inside the canal were the source of the grey look of the left exceptional incisor. A multidisciplinary method is to think about it required to fix the trouble: in the beginning endodontic retreatment, successively bleaching and coronal restoration. In order to establish both useful and also aesthetic integrity, composite laminate veneers should be considered in the majority of situations of corrective dentistry. Additionally, taking into consideration even more resistance and also compressive toughness than ceramics and similar abrasion prices compared to all-natural tooth structures, straight composite laminate veneer restorations were thought about.

**Keywords:** Composite Veneers in Restorative Dentistry, Prosthodontics, and Endodontics.

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## 1. INTRODUCTION

Increasing demands for aesthetic restorative treatments and also recent advances in adhesive dental care have resulted in the advancement of strategies and also products aimed at bring back the all-natural tooth appearance, particularly in the former section.

Re-establishing a client's shed all-natural dental esthetics is among the crucial topics these days's dental care, along with operate and also fonation <sup>(1)</sup>. Shade, form, and structural and also placement irregularities of anterior teeth could result in essential aesthetic issues for people. In order to resolve such troubles, the method preferred often is to cover the teeth with oral crowns <sup>(2)</sup>. Too much prep works of problems and also teeth to surrounding structures, such as gingiva, are some disadvantages of crowns <sup>(3)</sup>. For that reason, over the last few years, laminate veneer repairs, as an extra aesthetic and extra conventional therapy choice, have actually been used in dentistry <sup>(3,4)</sup>.

Compound veneers are repairs which are pictured to correct existing abnormalities, esthetic shortages and also discolorations <sup>(1)</sup>. Compound Laminate veneer reconstructions have 2 various kinds: direct and also indirect laminate veneers. Direct laminates are used on prepared tooth surface areas with a composite resin product directly in the oral clinic. Lack of necessity for tooth prep work, low cost for people compared with indirect strategies and also other prosthetic approaches, reversibility of treatment and no demand for an additional glue sealing system are some benefits of this method <sup>(5,6)</sup>. Intraoral polishing of direct laminate veneers is simple and any kind of fractures or fractures on the remediation could be repaired intraorally and limited adaptation is far better than that of indirect laminate veneer

restorations<sup>(7,8)</sup>. Nevertheless, the primary negative aspects of straight laminate veneers are low resistance to put on, staining as well as cracks<sup>(3,5,8)</sup>.

New ceramic and also composite materials have enhanced traditional treatments of endangered anterior teeth<sup>(9,10)</sup>. Indirect additive veneering was presented in the 1980s as an option to full-coverage crowns. The idea of no-preparation or minimal-preparation has actually followed the development of proper enamel bonding treatments. The shade as well as honesty of oral tissue substratum to which veneers will be bound are very important for clinical success; utilizing additional veneers with a thickness in between 0.3 mm and also 0.5 mm, 95% to 100% of enamel volume continues to be after preparation as well as no dentin is subjected<sup>(11,12,13)</sup>. A variety of clinical research studies have ended that bonded laminate veneer reconstructions supplied good outcomes over a duration of 10 years as well as even more<sup>(14,15,16)</sup>. The majority of the failings were observed in the form of fracture or low flaws of the repair<sup>(17)</sup>. Pure adherent failures are hardly ever seen when enamel is the substratum with shear bond toughness worth going beyond the natural strength of enamel itself<sup>(18)</sup>. Some indications for no-preparation veneering include erosion, incisal side micro fractures, adjustments for short as well as little crowns, and also alterations in the shallow enamel appearance. Restoration of missing out on oral tissue with resin composites is quick, minimally invasive, and low-cost as well as the resulting reconstructions are easy to fix, if required<sup>(19)</sup>.

**The objective of this article was to review the current literature covering composite veneers and their uses in the main there following branches; (restorative dentistry, prosthodontics, and endodontics)**

## 2. METHODOLOGY

A comprehensive review of the literature was conducted through electronic databases such as; PubMed/Medline, Embase, and Google scholar, searching evidence for restoration treatment using composite veneers in prosthodontics and endodontics published up to July, 2017. A search restriction was to only English language studies with human subjects. Moreover, References list found in dental journals concerning our article topic were manually searched for more relevant studies whether case reports, reviews, or Randomized clinical trials.

## 3. DISCUSSION

In the past years, dental professionals had actually been making use of several techniques as well as materials, such as resin and also porcelain to remedy visual troubles brought on by various medical conditions. Porcelain as well as other all-ceramic veneers are ranked as the most effective veneer reconstructions<sup>(20,21,22)</sup> for discolored or misshaped former teeth. Veneers have progressed over the last numerous years turning into one of one of the most prominent remediation devices in aesthetic dental care. The veneer is considered as a choice to complete protection and improves the aesthetic look of the anterior teeth. Excellent outcomes can be achieved with the contemporary innovative composite resin and glue systems; in contrast to conservative rehabilitation they have the ability to remedy existing abnormalities, visual deficiencies (fractured, malposed or misshapen teeth), and also discolorations where it is tough to recreate harmonious tooth shape and also shade. Drawbacks of the straight composite veneers include long term shade transforming, less use resistance, which indicates that they typically call for repair work or substitute, whereas downsides of ceramic veneers consist of irreversible removal of tooth structure, strategy level of sensitivity, cost and size of time needed from the first phase of tooth prep work until the restoration is ultimately seated<sup>(23)</sup>.

The tooth can be stained by deposition of pigments in its inner structure and also on its surface area (**Table 1**)<sup>(24)</sup>. Notably, the accurate diagnosis of staining is a problem with multifactorial etiology; it is identified as extrinsic as well as innate as well as can occur because of a variety of metabolic illness, regional factors as well as systemic problems (**Table 2**)<sup>(25)</sup>.

**Table1: Types of Stains and Etiological Factors Contributing In Tooth Discoloration**

Intrinsic discoloration	Extrinsic discoloration	Internalized discoloration	Types of stains
1. Alkaptonuria	1. Metallic	1. Developmental defects	1. Brown stain
2. Congenital erythropoietic porphyria	2. Non-metallic	2. Acquired defects	2. Black stain
3. Congenital		a) Tooth wear and gingival	3. Orange stain

hyperbilirubinaemia		recession	
4. Amelogenesis imperfect		b) Dental caries	4. Green stain
5. Dentinogenesis imperfect		c) Restorative materials (Manuel <i>et al.</i> , 2010)	5. Metallic stain
6. Tetracycline staining			6. Yellowish brown stains
7. Fluorosis			7. Violet to black
8. Enamel hypoplasia			8. Red-black
9. Pulpal hemorrhagic products			
10. Root resorption			
11. Ageing			

Direct and indirect composite laminate veneers, as aesthetic procedures, have become therapy alternatives for individuals with esthetic troubles of former teeth in recent years<sup>(3,8)</sup>. In deciding in between those 2 therapy choices, the price, social and time factors need to be taken into consideration. Ceramic laminate veneer restorations have some benefits like shade stability and high resistance versus abrasion, they have also some disadvantages, consisting of high expense and also lengthy chair time<sup>(3,10)</sup>. Furthermore, they have some troubles such as requirement of an added sticky cement. In addition, incorrect indicators, dental practitioner-- technician sychronisation troubles throughout shade harmonization, failure to mask the underneath discolored oral tissue due to the low preparation deepness, specifically at the cervical location, long chair time for repairing easy fractures as well as easy inattentions throughout cementation are still vital topics waiting for remedies<sup>(1,10,12)</sup>. Composite materials appropriate existing shortages, raise the physical residential properties and also are currently extra esthetic alternatives as opposed to laminate veneer applications. In addition, today's dentistry calls for more conservative therapy alternatives. Consequently, composite laminate veneer restorations, which require minimal removal of tooth framework, are just one of the very best treatment options<sup>(10,13)</sup>. With the benefits such as only one appointment for the whole treatment time, very inexpensive compared with the ceramics and also no demand for lengthy research laboratory procedures, direct composite laminate veneers are more popular in today's dental care<sup>(1,13)</sup>.

Nonetheless, direct composite laminate restorations have still less resistance against abrasions as well as fractures compared to indirect composite laminate veneers and ceramic laminates<sup>(3,6)</sup>. Indirect composite laminate veneer reconstructions due to polymerization outside of the oral dental caries, and ceramic laminate veneers due to much better color security since of being less influenced by the liquids of the dental caries, are premium to guide composite laminate veneers<sup>(3,8)</sup>.

**Table 2: Extrinsic and intrinsic factors and their characteristics**

Extrinsic factors	Characteristics	Intrinsic factors	Characteristics
Chromogenic bacteria stains	Green, black-brown and orange	Dentinogenesis imperfecta	Yellow or grey-brown
Tobacco	Black, brown	Amelogenesis imperfecta	Yellow-brown
Amalgam	Black, grey	Dental fluorosis	Opaque white to yellow-brown patches
Medicaments	Silver-nitrate: Grey black	Sulphur drugs	Black staining
	Stannous-fluoride: Black brown		
	Chlorhexidine: Black brown		
Foods and beverages	Coffee, tea, wine, berries, etc.:	Tetracyclines:	

Extrinsic factors	Characteristics	Intrinsic factors	Characteristics
	Color of corresponding food item	Chlortetracycline	Grey-brown hue
		Oxytetracycline	Brown-yellow to yellow
		Tetracycline HCL	Brown-yellow to yellow
		Dimethylchlortetracycline	Brown-yellow to yellow
		Minocycline	Blue-grey to grey
		Doxycycline	No change
Iron	Black cervical discoloration	Dental trauma	Transiently red through to black
		Ochronosis	Brown

**Composite veneers in restorative and endodontics & prosthodontics:**

Numerous Authors have actually suggested making use of composite resin veneers as direct or indirect technique for recovering anterior teeth as opposed to full-ceramic crowns which offer well-functioning and visual results <sup>(26,27,28)</sup>. Today, no corrective material has been much more effective compared to the homes of the natural dental frameworks themselves. Prefabricated composite resin veneers have been just recently introduced <sup>(29)</sup>. Specifically Compoener (Coltene, Altstatten) premade veneers are slim composite resin shells (0.3 mm cervically and also 0.6 - 1.0 mm to the incisal edge), made from a pre-polymerized hybrid composite material, harmony D6 (Coltene). The veneers are cemented with the very same crossbreed composite material that they are made from, which has the capacity of making the complete restoration as a monoblock system <sup>(30)</sup>. These veneers can be trimmed and bound to the tooth framework utilizing straight hybrid composite resin. One Coat Bond (Coltene) is the dentin adhesive included in the system, which is utilized to bond the premade composite coverings to the tooth framework making use of an etch-and-rinse bonding strategy <sup>(31,32)</sup>. Compound veneers tackle unique significance in Restorative Dentistry, as they are less costly, that makes this method a practical choice, primarily to people with a lower revenue and please the person's visual desires and corrective requirements <sup>(33)</sup>.

One situation record <sup>(34)</sup> of clients with a tarnished tooth, a maxillary left central incisor, which was compromising the aesthetic of her smile (**Figure 1**). On clarifying the medical history of the patient, it was kept in mind that the same tooth had actually been traumatized previously. The tooth has an old incongruous root canal therapy (short filling), with a broken instrument inside the canal, observed through pre-treatment X-ray (**Figure 2**).

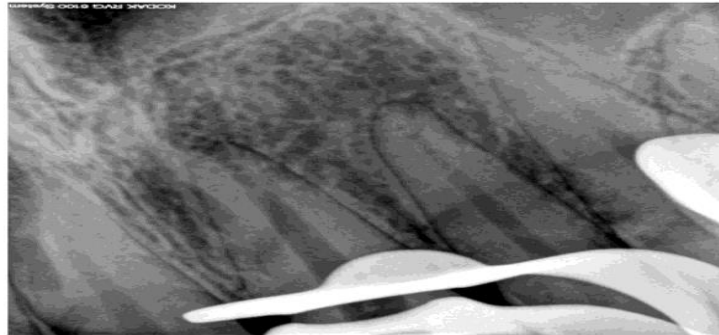


**Figure 1: Preoperative view of central incisor.**



**Figure 2: Pre-treatment X-ray.**

In addition, by professional examination the issue of an old composite obturation was evident. After the anamnesis collection of data and a total evaluation of oral condition to exclude existing pathologies, the tooth needing retreatment was diagnosed. The diagnosis for retreatment was made in accordance with the signs and also indicators reported by the patient and the preoperative radiographs revealing apical radiolucency. The essential element for accomplishing successful retreatment is comprehensive reshaping as well as cleaning of the canals to eliminate bacteria <sup>(35,36,37)</sup>. During retreatment the operators used bio orange solvent (OGNA) with hand K-file as well as ultrasonic tool (Mectron) to remove the busted tool, gutta-percha as well as sealer (**Figure 3**) <sup>(34)</sup>. Subsequently the tooth was prepared with Mtwo (Sweden & Martina) rotary Ni-Ti tools to functioning length as well as irrigated with 5.25% NaOCl and filling up with the Thermafil system (Dentsply; Tulsa Dental, Tulsa, OK, USA) <sup>(38)</sup> the Canal orifices were secured with short-lived product (**Figure 4**) <sup>(34)</sup>.



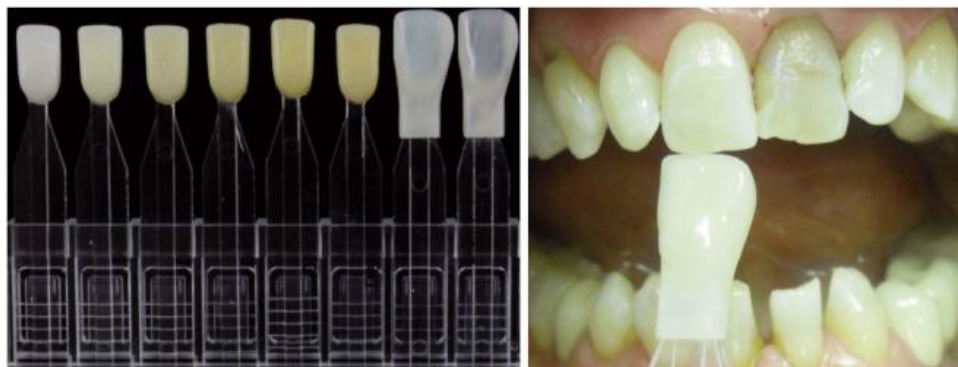
**Figure 3: Intraoperative X-ray.**



**Figure 4: Postoperative X-ray.**

The color is chosen with using the Compeer harmony D6 color overview (Coltene). The color guide has 6 dentin cores as well as two enamel coverings (**Figure 5**) <sup>(34)</sup>. After the teeth are cleansed, the enamel and also dentin shades are evaluated independently. The enamel covering guide is superimposed over the dentin core to establish the approximate last shade. The dimension of the composite covering for a details patient is picked with Compeer contour Guides.

It has also been reported that a good quality of endodontic retreatment on the postoperative periapical vision (**Figure 6**) may enhance the long-term aesthetic results of this method, resulting in good aesthetics, function and durability <sup>(34)</sup>.



**Figure 5: Compeer synergy D6 shade guide.**



**Figure 6: Postoperative clinical vision.**

Given the suitable indication, the whitening of non-vital teeth is a reasonably low-risk intervention to boost the appearances of endodontically treated teeth<sup>(39,40,41)</sup>. Relying on the circumstance, the strolling bleach technique can be a practical and straightforward technique for both dental experts and also clients: the bleach representative is collocated inside the pulp chamber, after putting a seal with glass-ionomeric concrete at the coronal section of the canal.

Some tooth stainings in endodontically dealt with teeth are caused by oral therapies. In the case report<sup>(34)</sup> the kind of root-canal loading product and drug representative, contributed in the discoloration tendency of the tooth<sup>(42)</sup>.

The strolling bleach technique was executed by interior bleaching treatment with an Opalescence endo (Ultradent) specifically, in the pulp chamber after that using Cavit as short-lived loading product to correctly seal the accessibility cavity after each operation<sup>(43,44)</sup>. The treatment was duplicated tree times.

Discolored former teeth are often viewed as a visual detraction. A selection of treatment, like porcelains or composite veneering, is offered for the remaining discoloration after the whitening strategy. In this case a glass-fiber messages (Sweden & Martina) was placed into the root canal to attain retention for the repair<sup>(46)</sup>, prior to doing the composite veneer.

The therapy contains upreared Compeer straight Composite Veneering System (coltene) to enhance the aesthetics of smile<sup>(45,46)</sup>. This method is less traumatic as well as extra conservative for clients with the added benefit that it can be carried out successfully in just a single session.

In other instance report<sup>(47)</sup> research including client with incisal edge fractures of maxillary main incisors, and consequently with aesthetic problems, referred to the faculty clinics. Old composite rehabilitation, surrounded with second decays, were found at the mesial edges of maxillary main incisors of the client after scientific and also radiographic assessments. In addition, attritions including enamel as well as dentin tissues at the incisal edges of maxillary and mandibular central incisors, because of a feasible bruxism problem, were noted (**Figure 7**)<sup>(47)</sup>. In this situation straight composite laminate veneer technique utilized for 3 patients with aesthetic problems associated with fractures, discolorations and an old prolapsed repair. Complying with anesthetics for maxillary centrals, old restorations were gotten rid of with a high-speed handpiece (NSK Pana Air, Japan) and also a rounded diamond bur (Acurata, Germany) under water cooling; 0.8-mm-deep walls were prepared on the labial surface areas of the teeth. Cervical boundaries of the prep works were set up just at the exact same line of the gingiva by setting a cervical step without striking the all-natural gingival contour (**Figure 8**). For distal and mesial margins of the teeth, transparent matrix bands were cut, used and also fixed with ideal wedges (**Figure 9**). For innovative sprucing up, discs (Ultra Gloss Composite Polishing System, Axis, USA) in different dimensions were made use of from coarse to fine grits (**Figure 10**)<sup>(47)</sup>. The patient was instructed in the oral hygiene and called at 6 months. At 6-month recall, no discolorations or disintegrations were detected (**Figure 11**).



**Figure 7. Secondary carious lesions at mesial margins of upper central incisors**



**Figure 8: Cervical step preparations**



**Figure 9: Transparent matrix band and wedge application**



**Figure 10: Finishing and polishing**



**Figure 11: Six-month recall, no discolorations or disintegrations**

#### **4. CONCLUSION**

In former aesthetic issues it's essential to comprehend the etiology of the discoloration: in the case provided the harsh products of the busted instrument inside the canal were the source of the grey look of the left exceptional incisor. A multidisciplinary method is to think about it required to fix the trouble: in the beginning endodontic retreatment, successively bleaching and coronal restoration. In order to establish both useful and also aesthetic integrity, composite laminate veneers should be considered in the majority of situations of corrective dentistry. Additionally, taking into consideration even more resistance and also compressive toughness than ceramics and similar abrasion prices compared to all-natural tooth structures, straight composite laminate veneer restorations were thought about.

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