

# A minimally invasive approach for aesthetic enhancement using indirect composite veneers: A case report

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## ABSTRACT

**Introduction:** Technique of composite veneers fabricated directly on a cast is easier and requires less clinical time and also the survival rates are statistically similar to ceramic veneers. **Case Report:** Composite veneers can be fabricated directly on a cast using the technique that have been described in this case report. **Conclusion:** Being inexpensive, less time consuming and having acceptable mechanical properties, indirect composite veneer is a good treatment option for discolored teeth.

**Keywords:** Dual cure resin cement, Fluorosis, Indirect composite veneers, Porcelain veneers, Smile design

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## INTRODUCTION

With the increasing acceptance of minimal invasive approach for aesthetic dentistry, the popularity of veneers has increased tremendously. However, the chances of debonding/fracture of veneers has also increased [1]. In conditions like moderate and severe fluorosis, veneers give good results for aesthetic correction.

Shaini et al. (1997) and Bruke and Lucarotti (2009) in a follow-up study of 6.5 years and 10 years respectively, found the failure rate of porcelain veneers to be 43% and 47%, respectively [2]. From a financial point of view and considering the failure rates of porcelain veneer, indirect composite veneers (ICV) are a less expensive option than ceramics, and they wear the antagonist enamel less than ceramics do, making this material more potent biologically as well [3]. The clinical time required for indirect technique is less compared to direct technique and hence it is by far the most popular technique [4].

## CASE REPORT

A 25-year-old female in good health reported to the Department of Conservative Dentistry and Endodontics

at Modern Dental College and Research Center, Indore with a chief complaint of discolored teeth leading to an unpleasant smile. There was no history regarding familial inheritance or birth injuries. Clinical examination revealed the presence of lustreless enamel with a yellowish mottled appearance seen bilaterally (Figure 1A). Based on the above observations the condition was diagnosed as “dental fluorosis with enamel hypoplasia” and “indirect composite veneers” were planned.

**procedure [5] the are:**

Firstly, shade selection was carried out using VITA shade guide. Teeth were isolated with bilaterally placed cotton rolls and no anesthetic was given as patient’s response is important in judging preparation depth, especially in gingival third of the tooth.

In maxillary anteriors, a window preparation was done using No. 1/4 narrow, round-tipped, tapered diamond, regular and coarse grit (0.8 mm) (MANI, INC, Utsunumiya, Tochigi, Japan) to a depth of approximately 0.5 mm to 0.75 mm mid-facially and incisally, diminishing to a depth of 0.3 mm to 0.5 mm along the gingival margin (gingival margin was positioned at the level of gingival crest) (Figure 1B). Also the inter-proximal margins were extended into the facial and lingual embrasures, without engaging an undercut, yet located just facial to the proximal contacts. The same procedure described above was repeated in lower anteriors.

An impression of the preparations was made using elastomeric impression compound (Aquasil Soft Putty/Regular Set, Dentsply, Konstanz, Germany and Aquasil Ultra CV, Dentsply Caulk, Milford DE, Caulk, U.S.A.) after placing the gingival retraction cord. The patient was then recalled for a second appointment. A stone working cast was generated from the impression using die stone (Kalrock, Kalabhai Kaeson Pvt. Ltd, Mumbai, India) (Figure 1C). The veneers were then fabricated on the stone cast itself after applying a layer of separating media (Cold Mold Seal. Pyrax Polymers, Uttarakhand, India) (Figure 1D). Incremental placement of composite (3M ESPE Filtek 2350 XT, St.Paul, MN, U.S.A.) was done and then each layer was cured (Unicorn Denmart, New Delhi, India) for 40 seconds. The composite veneers were then finished and polished using finishing and polishing discs (3M ESPE Sof-Lex, Bracknell, U.K.) and were then heat cured.

At the second appointment, the teeth to be veneered were cleaned with pumice slurry, the shade was confirmed and the operating site was isolated using rubber dam. The fit of each veneer was then evaluated on individual teeth. After the fit was evaluated, the shade of dual-cured resin cement which was to be used for final cementation was confirmed. A technique for individual placement of each veneer was recommended.

The tooth bonding side of the veneer was etched (Aquasil Ultra CV, Dentsply Caulk, Milford DE, Caulk, U.S.A.) and primed, and adhesive was applied (3M ESPE Single Bond Universal Adhesive, Dentschland, Germany), but was not cured. The tooth to be veneered was also then

etched, bonding agent was applied, but was not cured until veneer placement because premature curing of the adhesive could preclude the full seating of the veneer.

The dual-cure resin cement (PermaFlo DC, South Jordan, Utah, U.S.A.) was then applied on the tooth bonding side of the veneer with enough material to cover the entire treated surface without entrapping air. The veneer was then vibrated with the handle of the instrument and the excess cement was then removed using a micro-brush.

A visible light curing unit was used to polymerize the material with a minimum exposure time of 40 to 60 seconds from the facial and lingual directions for a total exposure of 80 to 120 seconds. Protrusive excursions were done to ensure occlusal harmony, then the postoperative



Figure 1: (A) Preoperative photograph showing dental fluorosis in canine to canine region in both maxillary and mandibular arches, (B) Window preparation in maxillary anteriors, (C) Stone cast generated from elastomeric impression of upper and lower teeth, (D) Composite veneers fabricated from the upper and lower stone cast.



Figure 2: (A) - Preoperative image of teeth, and (B) Postoperative image of teeth.

instructions were given to the patient and the patient was relieved.

Patient was then recalled after one year for follow-up (Figure 3). There was no breakage, discoloration, or wear of veneer seen.

## DISCUSSION

Vital teeth may be discolored at the time the crowns form and this abnormal condition may involve several teeth. The presence of excess fluoride in drinking water and other sources at the time the teeth are forming can result in a condition called “fluorosis”, resulting in intrinsic stains and is usually generalized [5]. In India, there are many states that have circumscribed areas of high fluoride levels like Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh, Andhra Pradesh and Tamil Nadu [6]. Depending upon the level of fluoride in the water supply, there is a wide range of severity in the appearance of mottled teeth, varying from: (1) questionable changes characterized by occasional white flecking of the enamel, through (2) mild changes manifested by white opaque areas involving more of tooth surface, to (3) moderate and severe changes showing pitting and brownish staining of the surface, and even (4) a corroded appearance of the teeth [7].

Also, enamel hypoplasia is another cause that leads to incomplete or defective formation of the organic enamel matrix of teeth, thus leading to unaesthetic appearance. These can be hereditary or environmental. There are several factors responsible for environmental enamel hypoplasia like nutritional deficiency, exanthematous diseases, congenital syphilis, hypocalcemia, birth injury, local infection or trauma, ingestion of chemicals like fluoride, and idiopathic causes [7].

For such teeth with problems like fluorosis and enamel hypoplasia, veneers are one of the best treatment options available. Several options for veneers are available like direct applied composite, processed composite, porcelain or pressed ceramic materials.

In the present case report, ICV technique was planned rather than direct composite veneer technique because of following advantages:

- (a) less chair side time [5],
- (b) indirectly fabricated veneers are much less sensitive to operator technique [5],
- (c) when multiple teeth are to be veneered ICV are less time consuming and less labour intensive [5],
- (d) ICV typically lasts longer as no contamination of saliva occurs at the time of fabrication [5],
- (e) ICV are preferred because the negative effects of polymerization shrinkage are restricted to the luting material space and superior physical properties and anatomical shape can be obtained [8],
- (f) ICV provide a rapid, safe, reversible and conservative alternative to restore the esthetics, function and biocompatibility of the teeth [5],



Figure 3: One year follow-up showing aesthetically pleasing veneers with no breakage, discoloration or wear.

(g) ICV can be repaired quickly and safely to extend the durability of these laminates,

(h) ICV provides more permanent and durable surface luster if operator simply finishes and polishes the laminates immediately after bonding.

Also, porcelain veneer was not chosen as a treatment modality because (a) composite veneers are cost effective as compared to porcelain veneers, and (b) the clinical performance of the indirect resin composite and ceramic laminate veneers showed no statistically significant difference in survival rates up to 36 months [3].

In this case, we have used dual cure resin cement for luting the veneers because dual-cured resin have capability to achieve complete polymerization in dark localizations because it possess chemical curing system along with a light-curing mechanism that provides an extended working time and hardens the resin cement rapidly to stabilize the restoration [8].

Although the preferred type of indirect veneer is the etched porcelain veneer, in our case indirect composite veneer was the best treatment option, because this technique supported the financial considerations of the patient and esthetics.

Gingivectomy was needed for crown lengthening for upper anteriors but patient was not willing to go for it and hence it was not performed. Also tooth no. 11 was rotated distobuccally and needed to be corrected by more preparation on its distal aspect. But the patient was not ready to undergo local anesthetic administration. If she would have been ready, sensitivity would not be an issue and the rotated tooth could have been corrected.

## CONCLUSION

To conclude we can say that for the treatment of cases with intrinsic stains like enamel hypoplasia, fluorosis and tetracycline staining, indirect composite veneers is one of the best treatment option for patients who are financially unable to afford the charges of ceramic veneer.

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### Author Contributions

Gufran Ali Syed – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Bhanupratap Singh Sisodiya – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Aparna Palekar – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Vijay Mantri – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Suruchi Sisodia – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

### Guarantor

The corresponding author is the guarantor of submission.

### Conflict of Interest

Authors declare no conflict of interest.

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