THE ADORABLE ADORO–A CASE REPORT

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Abstract
Veneer restorations are well suited for conservative and aesthetic
improvement of the anterior dentition. Indirect composite resin veneers
present optimal aesthetics and durability. Indirect composite resin veneers
utilize the advantages of both direct and indirect techniques in reconstruction
of restorations with improved physical properties. The objective of this case
report is to utilize the advantage of Indirect composite resin like ADORO in
treating discoloured anterior tooth due to old restoration.

Keywords: Indirect composite veneer,ADORO,Lumamat

Introduction
The advent of indirect composite resin materials and the ongoing
advancement of adhesive technology have generated the development of
several conservative aesthetic techniques for correction of a variety of
generalized colour defects. These defects include tetracycline
stains, fluorosis, hypoplasia, hypo-calcification, aging, pulpal necrosis and
morphological defects due to caries, trauma and genetic
factors.[Black, 1982]. Among the clinical procedures employed is the use of
Adoro (Ivoclar Vivadent) composite resin as an indirectly-fabricated
laboratory-processed laminate veneers. The material’s advantageous
properties are attributable to the high content of inorganic fillers in the
nanoscale range. In addition, the matrix incorporates a newly developed
aromatic aliphatic urethane dimethacrylate, whose toughness is superior to
that of the monomers utilized thus far.

To address the challenges presented by the direct composite resin
veneers, indirect composite resin veneer systems have been developed, which
allow the restorations to be processed in the laboratory or chair-side. When
subjected to heat in combination with increased exposure to visible-spectrum
light, vacuum or pressure, these types of restorations exhibit greater conversion of the resin through increased polymerization. This conversion may result in the improvement of the materials physical properties, such as wear-resistance, hardness, elimination of shrinkage, colour stability and biocompatibility [Villela, 1994].

Case report
Initial patient evaluation
An 22-year old female patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of old discoloured restorations in both maxillary central incisors (Fig. no.1)
Medical/dental history was obtained and initial radiographic and clinical examination was performed (Fig. no.2).
The discoloration disrupted the dominance [Lombardi, 1973] of the central incisors and the harmony of the smile. [Rufenachi, 1990]
A thorough visual assessment was performed to evaluate the occlusion, the morphologic, histologic and optical characteristics as well as the polychromy of the sound adjacent teeth.

Pre-operative Aesthetic Considerations
Shade Selection-
Shade was selected prior to isolation of the teeth to eliminate shading variations that can occur as a consequence of dehydration of the teeth, which results in an elevated value (lighter hue). Prior to shade selection, the teeth were cleaned with a prophy cup and a slurry of pumice with 4% chlorhexidine. It was found to be a B1 shade of Vita Shade Guide.
Selection Of The Restorative Composite Resins-
In this case different Adoro (Ivoclar Vivadent) composite resin was selected to compose the body of the restoration and translucency of the incisal edge.

Clinical procedure
1) Isolation was accomplished by means of a cheek and lip retractor, bilaterally placed cotton rolls and gauze.
2) A slurry of pumice and 4% chlorhexidine was used in a prophylaxis cup to clean the external aspects of the central incisors. The teeth were thoroughly rinsed for 30 seconds and dried with compressed air.
3) All dentin and enamel surfaces were treated with 35% phosphoric acid etching gel for approximately 15 seconds and a dentin-enamel adhesive was applied as per manufacturer’s instructions.
4) Tooth preparation was performed as it for a porcelain veneer with a veneer preparation system. To avoid random reduction of the facial tooth
structure,a depth cutter contained in the system was used to determine the initial preparation depth -0.5 mm. After facial reduction is completed, the degree of discoloration must be evaluated to determine whether additional reduction of tooth structure is required to provide additional space for the restorative materials (Fig.no.3).

5) A chamfer finish line which should be within enamel whenever possible to ensure an adequate seal of the veneer, was placed into the interproximal embrasures without breaking contact and confined in enamel along the incisal edge. This preparation is designed to protect the resin veneer, preventing it from chipping during excursive movements of the mandible or mastication.

6) The cervical chamfer was modified into a butt shoulder to provide more thickness to the restorative material at the gingival margin.

7) The entire preparation was further finished with aluminium oxide discs and polished with rubber cups. This step is especially important to prevent adherence of existing composite restorations in the prepared tooth to the resin veneer that will be built up over it.

8) The prepared tooth was cleaned in a rubbing motion with a cotton pellet moistened with 4% chlorhexidine. Prophylaxis cups are not recommended for cleaning at this stage, as they might provoke bleeding of the gingival.

9) Impression of both upper and lower arch was made using light body and heavy body putty material and finally the cast was poured using die stone.

10) After setting, the cast was trimmed.

11) Die hardener was applied followed by separator liquid.

12) Build up of laminate was performed using various ADORO indirect composite resins. (Fig.no.4)

13) It was then pre-cured and processed in Lumamat. (Fig.no.5)

14) After the complete curing phase, the veneer was allowed to cool down and checked in patient’s mouth for optimal fit. (Fig.no.6)

15) The veneers were polished with various abrasives.

16) The internal aspect of the veneer was cleaned, acidified with 35% phosphoric acid gel, and after rinsing and drying, silanated with MONOBOND –S for 60 seconds.

17) The prepared tooth was etched with 37% phosphoric acid gel (N-Etch, Lot No.R76751) for 15 seconds. The etchant was rinsed thoroughly and the surfaces were lightly air-dried to avoid desiccation.

18) The bonding agent (Tetric-N Bond) was applied to the prepared tooth and to the inner surface of the veneer, according to the manufacturer’s recommendations.
19) A dual cure resin cement (Multilink Speed Lot No. R64472) was used for the cementation.

20) Additional excess cement was removed with blade and ultra-fine diamonds. Interproximal finishing and polishing was achieved with ultra-thin strips used sequentially, according to their grits. Rubber cups were used subgingivally to polish any flashes and irregularities. Final polishing was done (Fig. no. 7) with Astro-Brush (Lot no. RL3773).

21) Patient was recalled after 6 months for follow-up (Fig. no. 8).

22) An aesthetic and natural restoration was achieved, fully satisfying the functional and aesthetic expectations of the patient.

Discussion

Several studies have reported that indirect composite restorations result in less microleakage than direct composite resins [Hasanreisoğlu, 1996] depending on the interaction between the dentin system and the restorative used.

In a study, the restorative method used produced a significant effect only when the gingival margin was placed in dentin.

Alavi Kianimanesh (2002) reported that, when bonding agents are properly applied, there is no advantage to the indirect technique in small class V cavities, but when large Class II cavities are restored, the effect of the shrinkage stress at the cervical margin placed dentin-cementum is most significant.

Irrespective of the restorative technique used, a study showed a significant difference between dentin and enamel margins, which is in agreement with the findings of Alavi, Kianimanesh (2002), Gerdolle et al. (2005).

Adhesive bonding of composites to dentinal surfaces is far more complex and less reliable [Eick JD 1997]. Dentin is a substrate with a highly oriented microstructure, dominated by tubules that converge from the dentine-enamel junction in the crown and from the cementum in the root.

The orientation of the tubules toward the cavity wall depends on its location. [Cagidiaco MC, 1997]. In the gingival wall, the tubules are perpendicular to the interface, but the influence of their direction on bond strength to dentin is still unclear. The direction of tubules appears to be an important variable in determining bond strength. This may determine the intrinsic wetness of the surface.[Ogata M, 2001].

On the isolation of the restoration site, it could be carried out using different methods. In some clinical studies on posterior composites, rubber dam was used to isolate the teeth [Bottenberg, 2007], whereas Turkun 2003, Kohler et al. and Pallesen and Qvist [Pallesen U, 2003] opted for cotton rolls and saliva suction device. Raskin et al in a 10-year evaluation of
posterior composites, did not observe significant differences between these two isolation methods.

According to Mitra et al.[ Mitra SB, 2003], the nanofilled composites was shown to have equivalent — if not higher — mechanical properties than the hybrid composite, since the nanocomposite showed high translucency, high polish and polish retention similar to those of microfilled composite in a study by Loguerico et al. in 2007, the nanofilled and microfilled composites showed the best surface appearance after 12 months.

**Conclusion**

The indirect composite resin veneer technique is practical and reliable in treating most of the single tooth discolorations. It allows the clinician to artistically treat aesthetically compromised dentition by using restorative material that can be fabricated intraorally, heat-treated to enhance its physical properties, and bonded with resin cements that provide improved shade matching properties. The indirect veneer is a viable treatment modality for clinician who enjoy free-hand bonding and the artistry that is associated with it, for it permits the operator to create natural restorations that meet the aesthetic and functional expectations of the patient in a single appointment.

**References:**


Pictures

![Fig.no. 1 Pre-operative view](image-url)
Fig.no.2 Pre-operative IOPAR

Fig.no.3 Tooth preparation

Fig.no.4 ADORO Indirect composite materials
Fig.no. 5  Lumamat 100

Fig.no. 6 Try-in of veneer
Fig. no. 7  Post-operative view

Fig. no. 8  6 months follow-up