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### MANAGEMENT OF ENAMEL HYPOPLASIA USING INDIRECT COMPOSITE VENEERS- A CASE REPORT

#### ABSTRACT

Esthetics denotes the beauty and youthful appearance of an individual. Many a times the beautiful smiles are masked by discolorations due to various reasons. One of common etiologies of tooth discoloration is dentinal fluorosis. Dental fluorosis can be treated various treatment modalities ranging from minimally invasive techniques like bleaching and veneers to full crowns restorations that require an extensive preparation. The present case report describes the management of enamel hypoplasia due to dental fluorosis with indirect composite veneers which broaden the range of restorative treatment alternatives.

KEY WORDS: Enamel Hypoplasia, Fluorosis, Indirect Composites, Veneer.

#### INTRODUCTION

Enamel hypoplasia is as an incomplete or defective formation of the organic enamel matrix of the teeth in the embryonic stage of the tooth<sup>1</sup>.

Enamel hypoplasia exists in two basic types which includes hereditary enamel hypoplasia and environmental enamel hypoplasia<sup>1</sup>. One among of environmental enamel hypoplasia is the ingestion of excess amount of fluoride leading to fluorosis.

This condition can be treated with various treatment modalities like bleaching, micro-abrasion, macro-abrasion ceramic veneers, direct composite veneers, indirect composite veneers, porcelain crowns etc.

The present case reports highlight the management of enamel hypoplasia due to dentinal fluorosis with new generation indirect composite restorative technique - an Adoro system.

#### Case report 1

An 18 year old male patient reported to the department of conservative dentistry and endodontics with a chief complaint of discoloration of his teeth. (Figure1)



Figure-1-Preoperative photograph

On thorough Clinical examination and after taking the past history into account it was diagnosed as enamel hypoplasia due to dental fluorosis. Treatment plan was established with the goal of improving the appearance of the patient with indirect composite veneers.

#### First clinical appointment

Impressions for upper and lower arch were made and study models were poured.

#### **Shade selection**

A1 SHADE is selected for this case using VITA Classical Shade Guide (vident, Baldwin Park, California).(figure2)



Figure2-Shade selection with vita shade guide

### Tooth preparation

Tooth preparation is limited to enamel with the depth of approximately 0.5-0.75mm mid facially and 0.3-0.5mm along the gingival margin depending on the thickness of the enamel. Chamfer finish line was given within the enamel to ensure an adequate seal of indirect composite veneers. Facial reduction was extended proximally to end facial to the contact area. (figure3)



Figure 3-Tooth preparation for indirect composite veneer

### Final impression

Final impressions were made with elastomeric impression materials and Stone working casts were generated from the impressions. Provisional restorations are usually not required since the preparation remains in the enamel. Composite veneers were fabricated by placing SR ADORO indirect composite material.(figure4 and 5). Final polymerization / tempering is performed in the Lumamat 100 unit by means of light and at a temperature of 104°C. (figure 6)



Figure 4- composite buildup

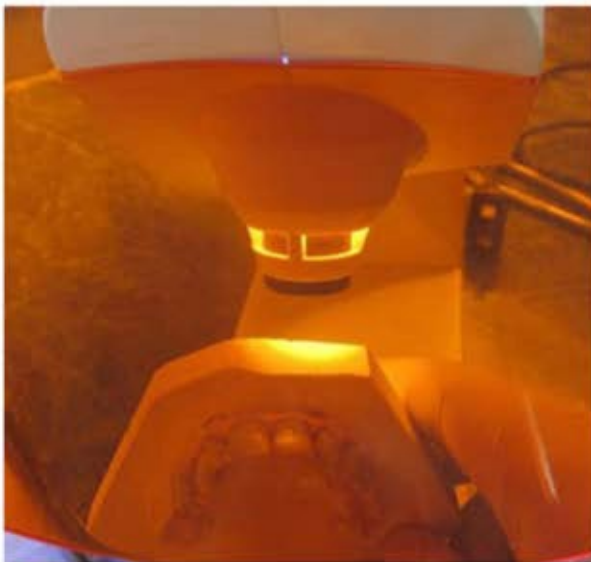


Figure 5- light curing



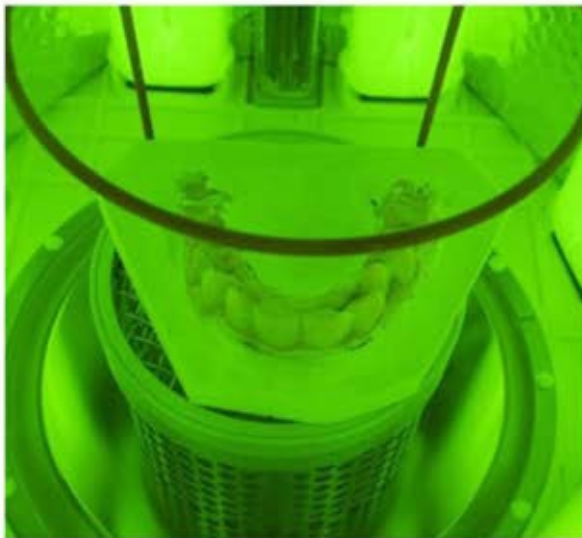


Figure 6- Heat curing at 104°C

#### Second clinical appointment

Veneers were inspected and the fit of the veneers was evaluated on the dried individual teeth were then finished and polished.

Surface conditioning with 10% hydrofluoric acid (Ceramic conditioner; DENTSPLY) was on the inner surface of the veneer to enhance the retention (FIGURE7).



Figure 7-Acid etching the veneer with 10% hydrofluoric acid

Polyester strips were placed in the interproximal surfaces and isolation was done with cotton rolls.

Following this acid etching (D-tech Etching Gel-37% phosphoric acid) was done for 15 seconds (figure8).



Figure 8-Acid etching the tooth



Figure 9- Application of bonding agent

Dentin bonding agent was applied to the etched enamel and lightly blown with air and left uncured until the placement of veneer (figure9). Dual cure resin cement (Variolink Dual Curing Cement from Ivoclar Vivadent Inc) was applied on the inner surface of the veneer (figure10). And was placed on the corresponding tooth and vibrated into position with a blunt instrument (figure11 and figure12).

Then the veneer Excess resin was removed with a micro brush and cured for a minimum exposure time of 40-60 seconds on facial and lingual sides each (figure13).

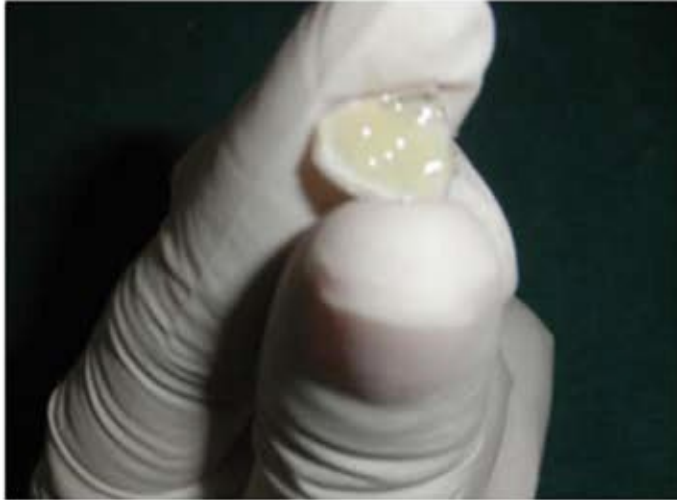


Figure10-coating the inner surface of veneer with varulink resin cement



Figure11- carrying the veneer on the tooth



Figure 12-Tapping the veneer with blunt instrument

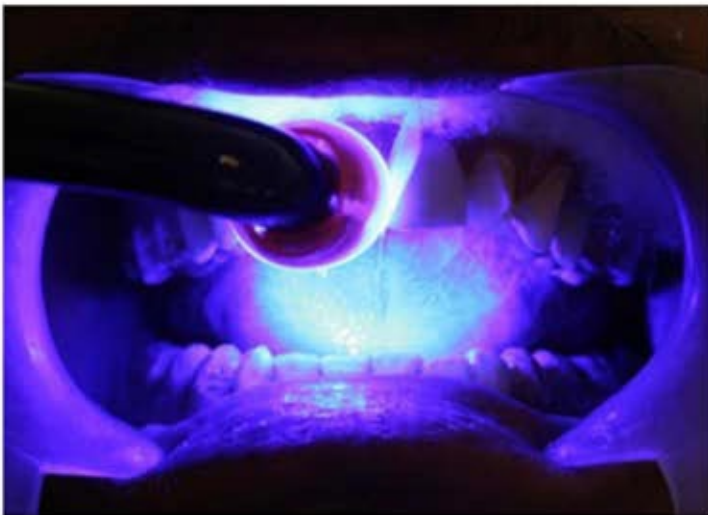


Figure 13-light curing





Figure 14-postoperative photograph

## **DISCUSSION**

A veneer is a layer of tooth colored material that is applied to a tooth to restore any localized or generalized defects and intrinsic discolorations<sup>2</sup>. Veneers are made of direct composites, indirect composites, porcelain or pressed ceramic materials.

Touati and pissanis and mormann<sup>3</sup> et al were first to introduce indirect composite resins in 1980. There are two generations of indirect composites.

Second generation indirect composite materials differs from first generation indirect composites in three ways, in structure and composition, polymerization technique and fiber reinforcement<sup>3,4</sup>.

Advantages of second generation indirect composite resin restorations include they have better marginal integrity, ideal proximal contacts, optimal aesthetics, color stability<sup>5</sup>, and excellent anatomical morphology<sup>6</sup>. They have wear resistance which is similar to the enamel hence compatible with opposing natural dentition<sup>6</sup>.

Polymerization of second generation indirect composites is done under special conditions like heat, vacuum, pressure and oxygen free environment exhibiting various advantages.<sup>7,8,9,10</sup>

In the present case reports we have used an ADORO which is microfilled composite veneering system. SR Adoro have advantages of the large filler particles and which are combined to microfillers using splinter polymers (copolymers) which allows the favorable properties of

microfillers to be incorporated into a composite material like non-sticky nature, good surface finish, homogeneous and soft consistency.

Traditionally BISGMA and TEGDMA used as monomers that contain hydroxyl groups making it more water soluble and subsequently leading to discolouration. Adoro system basically consists of aromatic aliphatic UDMA (urethane dimethacrylate) which has no hydroxyl group making it less susceptible to water absorption and solubility.

These restorations are cured at a temperature of 104°C, which gives excellent surface quality to the restorations and enhances the material properties. Indirect composite veneers were luted to the tooth structure by Variolink which provide higher bond strength and long-term colour stability for high-quality esthetics.

The cases presented were reviewed at the end of one year follow up period for color stability, marginal integrity and surface characteristics. All presented clinical cases showed successful clinical outcome.

### Conclusion

Indirect composite materials show low polymerization shrinkage due to the better conversion of monomer molecules, leading to decreased microleakage and secondary caries. They show optimal mechanical properties, good color stability and ideal interproximal contacts and contours. Being more conservative in the preparation, economical, less technique sensitive, easy to repair chairside with direct composites and easy to place they can serve as a viable alternative to the ceramic materials.

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