

Esthetic Correction of Dental Fluorosis and Midline Diastema with Lithium Disilicate Ceramic Veneers: A Case Report

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Abstract

Reestablishing the lost esthetic appearance is one of the important topics in contemporary dentistry. To achieve this, there are various advanced treatment options and materials. Instead of full ceramic crowns, dentists prefer more conservative treatments such as direct and indirect veneers.

Veneers can be used to correct discolorations, abnormalities in morphologies, and spacing between the teeth. Direct veneers are directly applied to the tooth surface in the mouth using composite whereas indirect veneers are fabricated in the laboratory and cemented to the tooth using self-adhesive resin cement. Indirect veneers can be fabricated using either composite or porcelain. The present case report discusses esthetic rehabilitation of the patient with midline diastema and dental fluorosis with lithium disilicate porcelain veneers.

Keywords: Dental fluorosis, Indirect veneers, Lithium disilicate.

INTRODUCTION

Porcelain ceramic veneers are well known esthetic and conservative treatment for anterior teeth presenting wear, fractures, interdental spaces facial defects, and fluorosis.^[1] The restoration of anterior teeth is one of the great challenges of esthetic dentistry.^[2] If the right indications are in place with correct techniques, longevity and durability of veneers are good.^[1] Veneers finished surface is very similar to the natural teeth and shows excellent tissue response. Veneers as natural teeth absorb, reflect, transmit light, and exhibit natural fluorescence.^[3] Full crowns have been the most durable esthetic correction and predictable treatment for many years. However, full crown leads to the removal of more amount of the tooth structure. Veneers can be either composite or porcelain. However, the major drawback of composite veneers includes susceptibility, short lifespan, wear, marginal fracture, and susceptibility to discoloration. These reduce the long-term esthetics of composite veneers so to subdue these limitations porcelain veneers are used.^[4]

Various clinical studies have concluded that veneers showed excellent results for 10 years and more. The improved adhesive systems, composite cements, and cementation procedures enable the use of this treatment approach among dentists.^[5] The present case report describes the treatment of discolored teeth due to fluorosis in the anterior teeth with lithium disilicate veneers to restore function and esthetics.

CASE REPORT

A 27-year-old female reported to the department of prosthodontics with the chief complaint of discolored teeth and midline diastema. No relevant medical history. No abnormal extraoral findings. Intraoral examination revealed fair oral hygiene with moderate dental fluorosis (Dean's Index). Spacing between two centrals, lateral and canine are observed (Figure 1). Teeth are vital and not hypersensitive. Overjet and overbite of 2 mm are seen in maximum intercuspation. No protrusive or lateral interferences are seen. Based on clinical and radiographic findings, the present case is diagnosed as moderate dental fluorosis. The treatment options were discussed with the patient such as bleaching, microabrasion, composite veneers, and indirect veneers.

After taking the patient consent, rehabilitation with porcelain veneers with incisal lingual wrap type was finalized for maxillary anterior teeth canine to canine (13,12,11,21,22,23).

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Figure 1: (a) Pre-operative extra oral, (b) pre-operative intraoral, (c) diagnostic wax up

Clinical procedure

After the completion of the examination, diagnostic impressions were taken with alginate (Dentsply Zelgan) and diagnostic casts were poured in dental plaster. The casts were mounted on a mean value articulator in maximum intercuspation. For uniform reduction of tooth structure, silicone putty index (Dentsply Aquasil Soft Putty) of the diagnostic cast was taken.

Diagnostic wax-up was done for six anteriors with diagnostic wax (Figure 1). Shade selection was done under natural light using VITA Classical shade guide.

Tooth preparation

Preparation was started with depth cutting grooves of 0.3 mm on the gingival third and 0.5 mm on the incisal half using depth cutting diamond bur. Using round end tapered diamond bur, the remaining tooth structure was removed. Two-plane reduction was done to impersonate the natural curvature of the tooth and also to provide even thickness of porcelain. Using silicone matrix tooth, reduction was verified. To conserve enamel, interproximally tooth preparation was extended without breaking contact to the contact areas. To improve translucency and to provide a positive seat for luting, incisal reduction of 1 mm was done with incisal overlap. At the level of the gingival crest chamfer, finish line was given with 0.4 mm maximum depth. To reduce stress in the margins of the veneers, all the internal line angles were rounded (Figure 2).

Recording an impression and temporization

A retraction cord (No.000) was placed in the labial gingival sulcus for 5 min. Full arch impression was made in two-stage technique using polyvinyl siloxane material (Aquasil Soft Putty/regular set, Dentsply, Germany) (Figure 2).

Temporization was done using temporary crown and bridge acrylic resin and flowable composite resin with spot etching was used to temporize (Figure 2).

In the dental laboratory, the maxillary and mandibular impressions were poured, dies were formed and veneers were fabricated lithium disilicate (IPS e. max CAD; Ivoclar Vivadent AG) (Figure 3).

Try-in and cementation procedure

Temporaries were removed and teeth were cleaned and dried before the trial procedure. The veneers were verified for fit,

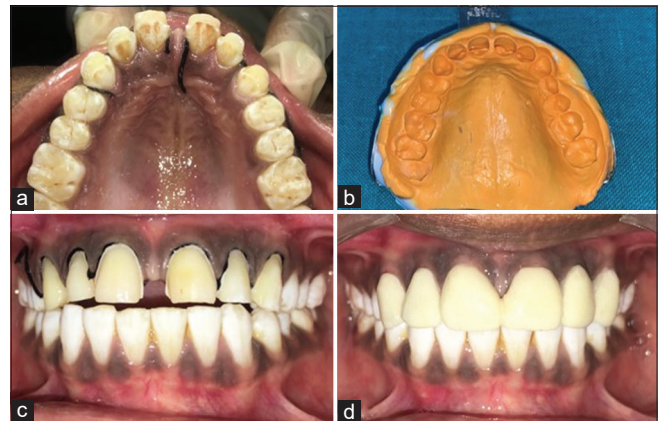


Figure 2: (a) Tooth preparation – palatal view, (b) two-stage polyvinyl siloxane impression, (c) prepared teeth with retraction cord placed, (d) temporization

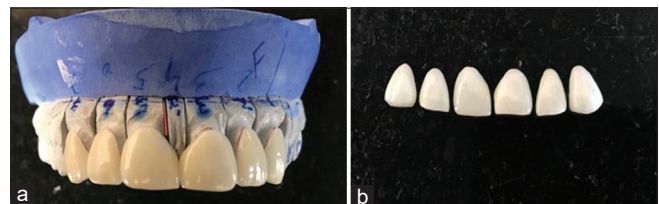


Figure 3: (a) Lithium disilicate veneers on the cast, (b) finished and polished veneers

marginal adaptation, shade, and contour. After the try-in check was complete, the veneers were etched with 10% hydrofluoric acid (Angelus Porcelain Conditioner) for 20 s. Veneers were washed and air-dried. Then, silane coupling agent (Angelus Silano Silane Coupling Agent) was applied on the intaglio surface and air-dried for 60 s. The teeth and the adjacent tissues were isolated. The prepared tooth was etched by applying 37% phosphoric acid for 15 s after which they were rinsed and dried. Following etching, the bonding agent was applied, gently air-dried, and cured for 40 s for polymerization. Dual-cure resin cement (RelyXTTM U200, 3M ESPE, St. Paul, MN, USA) was used for luting the veneers. The luting resin was cured for 40 s for polymerization. Excess cement was removed using explorer. Using aluminum oxide disks, the cement margins were finished. The pre-operative and post-operative pictures of the patient are shown (Figure 4).

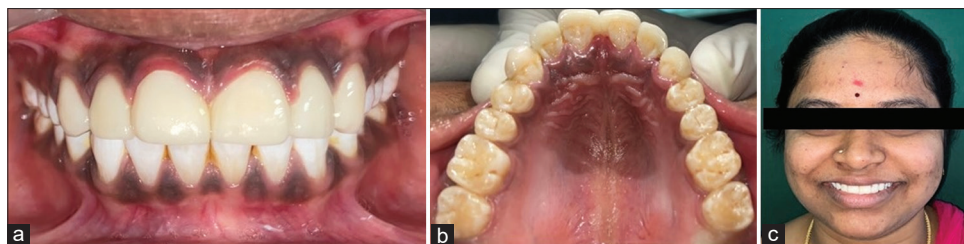


Figure 4: (a) Cemented prosthesis, (b) cemented prosthesis – palatal view, (c) post-operative – extraoral

DISCUSSION

Porcelain veneers due its minimal tooth removal are the preferred restorative options for anterior teeth and also due to the advanced adhesive systems that enhance the bonding of thin veneers to the tooth structure.^[6] Four types of incisal edge preparation have been described for porcelain veneers – Window preparation, Feathered-edge preparation, Palatal chamfer preparation, and Butt joint Preparation.^[7] The choice of preparation and material depends on the tooth being restored, esthetics, and function.^[6] The longevity of veneers pivots on the right case selection and treatment plan.^[8] Isolation is pivotal to prevent contamination during cementation procedures. Proper isolation during procedures will increase the longevity of the veneers.^[9] According to Alenezi *et al.*, “the 10-year estimated cumulative survival rate (CSR) of PLVs was 95.5%. The 10-year CSR of PLVs when fracture, debonding, the occurrence of secondary caries, and the need for endodontic treatment was considered as isolated reasons for failure were 96.3%, 99.2%, 99.3%, and 99.0%, respectively. PLVs without incisal overlap had a higher failure rate than PLVs with incisal overlap.”^[10] Veneers should not be given in cases with insufficient enamel, endodontically treated teeth, parafunctional habits, and poor oral care.^[3] Therefore, the case must be selected cautiously and treatment should be done with a properly formulated treatment plan.^[8]

CONCLUSION

Porcelain veneers are indicated in cases with discoloration, spacings in between teeth, Midline diastema, malformed

or malposed teeth, and teeth with extensive restorations. Lithium disilicate ceramic veneers are most thin and can be used with conservative preparation, tissue acceptance, and patient satisfaction. The treatment enhances self-esteem by enhance patients ‘smile and has constructive psychological effects.

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