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Esthetic smile designing with porcelain laminates – A case report

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ABSTRACT

Porcelain laminate restorations are one of the most successful treatment modalities for cosmetic improvement of unsightly anterior teeth. Porcelain veneers within reason allow for the alteration of tooth position, shape, size and color. They require a minimal amount of tooth preparation. This case report describes the management of a case of dental fluorosis and unaesthetic gingival contours by gingival reshaping and final esthetic rehabilitation with porcelain laminates.

1. Introduction

Teeth contribute an important part to one's appearance. A person's appearance and more importantly self perception of his own appearance have a vast influence on his confidence.[1]

Porcelain laminates are one of the most successful treatment modalities for cosmetic improvement of unsightly anterior teeth. Conventionally, laminates were indicated to correct problems such as unacceptable or peculiar tooth contours, interdental spacing, gingival recession, malpositioned teeth, and discolored teeth or to address minor tooth alignment issues.[2]

This case report describes the management of a case of dental fluorosis and unaesthetic gingival contours by gingival reshaping and final esthetic rehabilitation with porcelain laminates.

2. Case report

A 22 year old girl reported to Department of Prosthodontics with the chief complaint of discolored teeth and unattractive smile thereof. On clinical examination, the patient had generalized enamel fluorosis affecting all the permanent teeth [Fig. 1]. Confluent pitting was present on most of the surfaces of the upper and lower teeth with wide spread yellow-brown stains. She had an Angles Class-I occlusal relationship. Oral hygiene was satisfactory but gingival zenith was squarish giving an unaesthetic appearance. A discrepancy in plane of orientation of the maxillary teeth was also noted on the left side. Radiographic examination showed no caries or alveolar bone loss. Oral prophylaxis was carried out followed by bleaching (Pola Office+, SDI, Australia) but no reduction in the intensity of stains was achieved. After explaining all the

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Fig. 1 – Intraoral picture showing generalized enamel fluorosis.

Fig. 2 – Diagnostic wax up.

existing treatment modalities to the patient, it was decided to reshape the maxillary gingival zenith with soft tissue laser and restore maxillary anterior teeth upto first premolars and mandibular anterior teeth with porcelain laminates.

3. Procedure

Maxillary and mandibular diagnostic impressions were made with irreversible hydrocolloid material (Plastalgin, Septodont, France). Diagnostic casts were prepared and mounted on Hanau H2 articulator using a facebow transfer and a diagnostic mock wax up was done [Fig. 2]. A soft tissue diode laser was used for gingival reshaping of maxillary anterior teeth [Fig. 3]. Patient was recalled after a healing period of 2 weeks. An orientation depth groove of 0.5–0.8 mm was made labially with a three tier diamond cutter for maxillary and mandibular anteriors and maxillary first premolars. The remainder of the tooth surface was prepared using round end tapered diamond bur. Care was taken to restrict the tooth preparation in enamel only. This is because bonding to enamel is most reliable and ensures long lasting and strong bonds. Proximally, the preparation was extended till the mesiodistal contact areas without involving the contact points. The incisal edges of the teeth were reduced approximately 1 mm to allow for adequate bulk of restorative material and were extended lingually to form an incisal wrap with a chamfer finish line. It was ensured that finish line was relieved from opposing centric contacts [Fig. 4]. The final finishing of the tooth preparation was done using extra-fine diamond bur. Gingival retraction was done using single cord (Siltrax, 000, USA) technique and final impressions were made using putty-wash (Aquaqsil, Dentsply) double mix technique [Fig. 5]. Chairside provisionalization was done with tooth colored resin (Protemp, 3M ESPE) [Fig. 6]. Occlusion was checked in centric, lateral, and protrusive movements.

Dies were fabricated from type IV dental stone (Kalstone, Kalabhai, India) using Dilok trays. The cervico-incisal dimensions of the maxillary left anterior teeth were accordingly increased during the wax up stage to rectify the discrepancy in the plane of orientation [Fig. 7]. The laminates were fabricated from IPS Empress (Cergo, Degudent, Germany) using the lost wax technique. The restorations were adjusted to the master die and then tried on the patient to check for marginal fit, contours and aesthetics. After patient's approval, internal surface of the laminates was microetched with 8% hydrofluoric acid and silane coupling agent was applied and air dried. The teeth were cleaned using pumice slurry. They were acid etched with 37% phosphoric acid for 15 s and rinsed thoroughly. All the teeth surfaces were then coated with bonding agent and light polymerized for 15 s. Dual cure composite luting agent (Variolink-II, Ivoclar) of appropriate shade was selected and coated on the internal surface of the laminates. These were then placed over the teeth and initial polymerization was carried out for 5 s. Excess luting agent was removed with floss and explorer followed by curing for 60 s on each tooth. The laminates were cemented contralaterally one after the other. Laminate margins were refined with extra-fine diamond burs and polished after 24 h [Fig. 8] with a ceramic polishing kit.

4. Discussion

The primary objectives of cosmetic dentistry are to attain the best possible esthetic results and at the same time preserve

Fig. 3 – Gingival zenith reshaping with diode laser.