



## Enhancing White and Pink Esthetics using Porcelain Laminates in a Fluorosis Patient

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### ABSTRACT

Fluorosis can cause enamel degeneration to varying extent depending on the fluoride levels prevalent in that particular area. It can range from slight mottling of enamel to severe degeneration leading to demineralization and resultant discoloration. In the latter case, treatment options are limited to bonding of the outer surface of teeth either with composite or porcelain.

**Clinical significance:** Porcelain laminates offer an excellent solution to enhance esthetics in a patient with fluorosis as it combines the advantage of being highly esthetic along with being conservative in its penetration to enamel.

**Keywords:** Enamel, Porcelain, Laminates, Conservative.

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### INTRODUCTION

Smile is a gateway to success. The magic of an improved smile can instill confidence in a patient to a degree unimaginable. Since smile is a complex phenomenon which involves colors, illusions, proportions, etc. to achieve the desired result one has to encompass all the principles of esthetics.

Fluorosis is a typical problem in certain parts of western India, where the fluoride content in water exceeds the desired levels. The problem can pose a major threat to the personality of a person since the color, shape and form may get affected to varying degrees depending upon the degree of malformation of enamel and concentration of fluoride in water.<sup>1</sup>

### CASE REPORT

A 20-year-old male patient reported to the dental office with the chief complaint of unsatisfactory esthetics due to deep yellow-brown color of teeth since childhood (Fig. 1). Also,

he complained of small size of teeth and more gum display during smiling.

Various treatment options were offered and discussed with the patient in order to restore the patients smile perfectly. This included teeth whitening, composite direct chairside bonding and porcelain laminates. Since, the predictability of teeth whitening is questionable especially due to deeply stained teeth and probability of relapse after a certain time. Thus, this treatment modality was ruled out<sup>2</sup>.

Composite bonding was also considered since it can offer immediate chairside results for such a case. But, the demerits of this technique, such as probability of chipping and tendency of staining, were factors good enough not to consider this treatment option.<sup>3</sup>

Thus, the option which is also considered the better of the rest was porcelain laminates which could offer a long-term solution for optimum esthetics since porcelain laminates are resistant to chipping, staining and can impart the most life-like esthetics. In addition, characterizations are also possible in porcelain laminates to a greater and more predictable degree to further mimic the natural teeth.<sup>4</sup>



**Fig. 1:** Preoperative photograph showing deep yellow discoloration of teeth

In addition to this, the problem of excess gum tissue resulting in a gummy smile was planned to be corrected with the help of gingivectomy to yield the correct ratio of length to width of the anterior teeth.

Preoperative photographs were taken to record the diagnostic casts to record the color, form and shape of teeth prior to treatment. Gingivectomy was done with the help of a 15-C BP blade to expose more of the clinical crown after assessment of biologic width with the help of a periodontal probe (Fig. 2). Length to width ratio was verified using vernier calipers and gingival zenith was maintained for optimum esthetics. This yielded a better and more esthetic ratio of length to width of teeth. Patient was recalled after 2 weeks for laminate preparation after placing a periodontal dressing pack. Tooth preparation was done for porcelain laminates with a deep chamfer margin (approx. 0.8 mm) with a tapered round end bur using a palatal overlap design. Preparation was done keeping the following features in mind:<sup>5,6</sup>

- a. Uniform preparation along the labial surface using a deep chamfer margin leaving no unsupported enamel keeping intact proximal contacts.
- b. Palatal overlap ending in a butt joint margin was prepared on the lingual fossa of the anterior teeth. The location of the butt joint was decided after evaluating the overbite and incisal guidance offered by the anterior teeth. This is to prevent debonding of the laminates during functional movement of the jaws.
- c. Chamfer margin was kept equigingival to prevent underlying dark yellow tooth structure from showing through at the margins.
- d. Preparation was finished with finishing diamond points and rubber disks to yield a smooth finish to the preparation (Fig. 3).
- e. Impressions were made with rubber base impression material (Express XT, 3M ESPE) using two-stage technique after gingival retraction.



**Fig. 2:** Gingivectomy to expose more clinical crown length



**Fig. 3:** Tooth preparation for porcelain laminates

- f. Provisionalization was done with composite resin using a three point etch technique. This allowed the patient to evaluate esthetics prior to the final treatment.
- g. Laboratory fabricated porcelain laminates were (e-max, Ivoclar) tried on the patients mouth (Fig. 4).
- h. Laminates were cemented onto the prepared teeth with resin luting cement (Rely X Veneer cement, 3M ESPE; Figs 5 and 6).

## DISCUSSION

Porcelain laminates offer a good solution to overcome esthetic deformities in anterior teeth by offering a long-term solution in terms of strength, resistance to staining and conservation of remaining teeth. These could be the treatment of choice in a case with fluorosis with deep brown spots, amelogenesis imperfecta, diastemas, etc.<sup>7</sup>

As a treatment modality, it scores over composite bonding in terms of overall esthetics, strength and longevity. Besides the present day resin luting cements offer good bond strengths and esthetics to match the underlying tooth



**Fig. 4:** Trial of porcelain laminates (e-max) using a try-in paste



**Fig. 5:** Postoperative photograph showing cemented porcelain laminates (e-max) showing normal overjet and overbite



**Fig. 6:** Postoperative photo with cemented porcelain laminates

structure. As mentioned earlier, it has definite advantages over other esthetic treatments in terms of overall strength, esthetics and longevity.<sup>8</sup>

The primary concern in these restorations is case selection in terms of overbite and overjet resulting in favorable incisal guidance. Besides this, the technique of tooth preparation is critical since there is mainly labial preparation unlike a full veneer crown, where there is complete encirclement.<sup>9</sup>

Another concern often is the color of the underlying tooth structure. Sometimes a devitalized tooth can pose a threat to the color of the laminate by transmitting its shade. But, this problem can be offset by either doing nonvital bleach for the tooth in case it is endodontically treated or with the help of resin cement of a particular shade.<sup>10</sup>

## CONCLUSION

Porcelain laminates are considered a long lasting esthetic alternative to a patient with discoloration due to enamel malformation. Besides being highly esthetic, it offers

excellent conservation of underlying tooth structure. After all, changing the smile of a person can change the life of a person for good... permanently!

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