Case study

"Esthetic rehabilitation in maxillary anterior zone in patient with fluorosis and congenitally missing lateral incisors with space closure using laminate veneers-A Case Report"

ABSTRACT

Cosmetic dentistry has broadened significantly in recent decades and restoring aesthetic appearance is a clinical challenge. Veneers is a minimally invasive method of restoring discoloured, fluorosed teeth and teeth with spacing. One of the main reasons causing teeth discoloration is dental fluorosis, which is significant problem compromising dental aesthetics. Laminate veneers offer great assurance in this regard as they provide perfect aesthetic results in a very conservative way and simultaneously meet the structural, functional, biological and mechanical requirements necessary to ensure long term clinical performance. This case report describes the case of congenitally missing lateral incisors and severe dental fluorosis causing brownish patchy discoloration of the teeth which were contoured and restored with porcelain laminate veneers to achieve the desired aesthetic outcome.

Comment [FS1]: Two lateral incisors are missing

Key Words- Aesthetics, Fluorosis, Laminate veneer, Tooth Discoloration.

INTRODUCTION

In today's aesthetic ambitious modern world, teeth discoloration is a potential source of concern in some patients. Several factors can cause teeth discoloration which lead to unpleasing smiles in such patients. Mainly caused by extrinsic stains present in some foods and beverages while others result from intrinsic discolorations caused due to devitalisation of pulp, excessive fluoride intake during childhood, use of tetracycline antibiotics in children under 8 yrs. of age and trauma to the tooth bud during development [1,2].

Long term clinical success of laminate veneers completely depends on the suitable indications of the patients and the correct application of the materials and techniques [3]. Their indications apart from teeth discolorations include non- aesthetic tooth shape or contour requiring morphologic changes, minor tooth alignment, diastema closure, dental fluorosis with enamel mottling, minor chippings or fracture of teeth [4,5]. Contraindications to placement of veneers include patients with anterior deep bite, severe bruxism or other para-functional habit, presence of any soft tissue disease, severely misaligned teeth and teeth with existing periapical pathologies [6].

CASE PRESENTATION

A 24 yrs. old female patient reported to the Department of Prosthodontics, with the chief complaint of unpleasing smile due to severe brownish discoloration and spacing between anterior teeth. Clinical

examination revealed missing right and left upper lateral incisors and generalized fluorosis representing as opaque patches, subsurface brown staining and small pits in enamel (Fig. 1)

Figure 1: Preoperative clinical photographs: (a) frontal view, (b) lateral view: left side, and (c) lateral view: right side. (d) intra oral view revealing overjet.

Comment [FS2]: The angle of the photos can be adjusted so that the occlusal plane is straight In photographs

The patient was informed about treatment options, which includes ceramic or composite veneers, along with the advantages and disadvantages of each option. Patient was convinced for eight porcelain laminate veneers from his upper right 2nd premolar to upper left 2nd premolar.

After the clinical examination, upper and lower alginate (Algitex; Dental Products of India) impressions were made and 3D Printed diagnostic mock-up cast was made to predict the correct values and to ensure symmetry and proportion to the patient smile (Fig. 2a). As the upper right and left lateral incisors were missing, right and left canines were recontoured into lateral incisors and right and left first premolars were recontoured into canines.

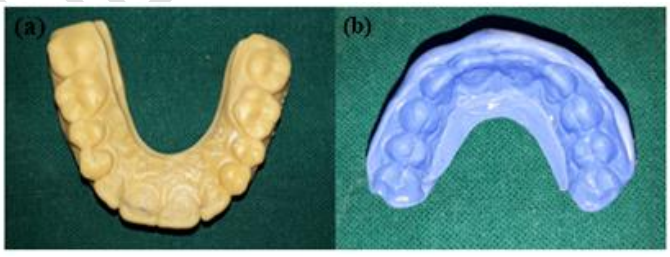

Figure 2. (a) 3D Printed Mock up Cast (b) Putty Index

The shade was selected using the VITAPAN classical shade guide. The enamel of the selected maxillary teeth was prepared using a flat-end tapered diamond bur to a depth of 0.5–0.75 mm facial reduction and 1.5 mm incisal reduction (Fig.3a). A chamfer finish line was placed at the level of gingival margin. The proximal margins were extended into the facial and gingival embrasures.

Following tooth preparation, gingival retraction was done using retraction cords (Fig.3b). Impressions were made with a polyvinylsiloxane material (Silicone Impression material; Avue). Direct method of temporization was followed and provisional restoration was polished using burs and polishing discs and cemented using light cured composite (Fig.4).

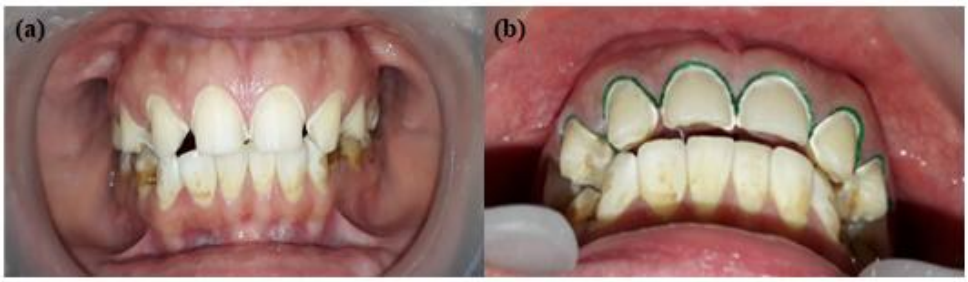

Figure 3. (a) Tooth preparation (b) Gingival Retraction Cord Placement

Laminate veneers were fabricated with a lithium disilicate-reinforced glass ceramic material. Fitting surfaces of the veneers were etched with hydrofluoric acid (Ivoclar etching gel) for 60 seconds, washed under running water and dried. Silane coupling agent agent (Monobond S; Ivoclar Vivadent) was applied on the veneers' surfaces and air-dried after one minute. Then, the prepared teeth were etched using 37% phosphoric acid for 30 seconds, rinsed, and dried. A layer of bonding agent (Monobond N; Ivoclar Vivadent) was applied on the prepared tooth surfaces. A silane coupling agent is applied to the etched surface and left to dry.

Figure.4 Temporization

After drying, a dual cured resin cement (Variolink; Ivoclar vivadent) is applied to the inner surface of the laminates and the laminates are positioned and gently pressed on to the teeth. After that, each veneer was light-cured for 30 seconds from facial aspect and 30 seconds from lingual aspect. First two veneers of the central incisors were simultaneously cemented. This was followed by cementation of the veneers of the two canines which were contoured to look like as lateral incisors. Then, first premolar veneers were cemented which were contoured to look like as canines and finally second premolar veneers were cemented. Carbide finishing burs were used to remove excess resin cement at the margins and final finishing was done with polishing cups and points (Fig.5). The patient was happy with the final result of the treatment and post treatment instructions and maintenance protocols were explained to the patient.

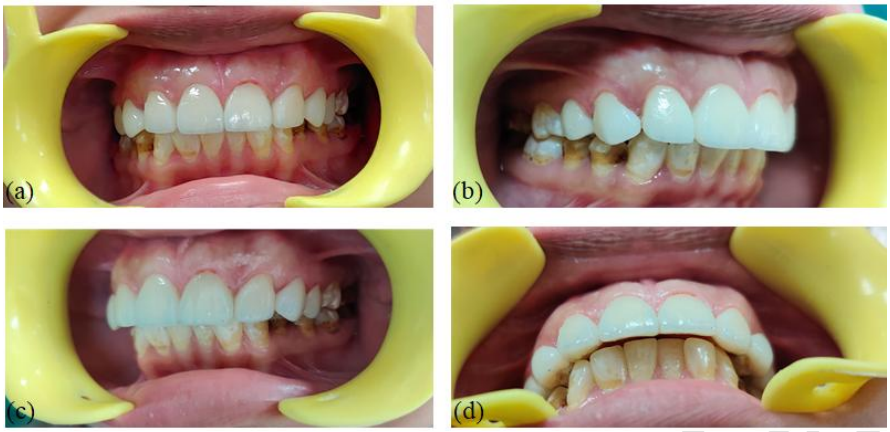

Figure 5. Post operative clinical photographs:(a) frontal view, (b) lateral view: right side, and (c) lateral view: left side (d) intra oral view revealing overjet.

DISCUSSION

The goal of the treatment in this case was to restore the patient aesthetics and self-esteem. Porcelain veneer offers precise colour match and translucency to the natural tooth. Porcelain veneers are very suitable for young adults who have large pulp chamber and pulp horns close to the outer enamel surface [(7)]. No prep veneers (thickness 0.3–0.5 mm) with the advantages of painless procedure, elimination of postoperative sensitivity, tooth structure conservation and longer-lasting restorations due to enamel bonding is the current advancement in esthetic dentistry [(8)]. There are different types of veneer materials such as feldspathic porcelain, leucite reinforced porcelain, aluminium core porcelain and lithium disilicate porcelain. According to many studies lithium disilicate has a better shear bond strength and hence the chances of ceramic chipping is less in lithium disilicate as compare to other materials [(9)].

Comment [FS3]: ?compared

There are different designs for teeth preparations namely, the window or intra-enamel preparation, the incisal overlapped preparation, and the complete veneer preparation [(10)]. In this case, Incisal overlapped preparation design was used because of its significantly higher fracture load values as compared to window and complete veneer preparation. The patient was instructed not to use aerated drinks or mouthwashes for first 48 hours, avoid hard foods and extremes in temperature.

CONCLUSION

Rehabilitation of this patient was challenging as the patient presented with discoloration, interdental spacing and congenitally missing lateral incisors which required recontouring of the canines to lateral incisors. All these are clear indications of veneers and thus it was decided as treatment of choice. Finally, patient was satisfied with her aesthetics. Ceramic veneers are one of the most popular and reliable restorative materials in aesthetic dentistry. They provide excellent aesthetic results when an appropriate treatment plan and protocol is followed. This case report reveals the importance of

laminate veneers in providing an aesthetically pleasing smile as well as confidence, thus providing an improved quality of life.

CONSENT

Written consent was obtained from the patient for the agreed dental treatment and the use of her records or photographs for publication purposes.

ETHICAL APPROVAL

Ethical approval is not applicable.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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