

Direct composite veneers an aesthetic alternative: case series with one year follow up

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Abstract : No- or minimal-preparation veneers associated with enamel preservation offer predictable results in esthetic dentistry. Veneers are restorations which are envisioned to correct existing abnormalities, esthetic deficiencies and discolorations. It may be processed in two different ways: direct or indirect: direct additive anterior composite restorations represent a quick, minimally invasive, inexpensive, and repairable option for a smile enhancement treatment plan. In this case series, direct composite laminate veneer technique, used for three patients with esthetic problems related to peg shaped laterals, discolorations (flurosis) and diastemas, is described and success in 1 year follow-ups is discussed. As a conclusion, direct veneer restorations may be a treatment option for patients with the esthetic problems of anterior teeth in cases similar to those reported here.

Keywords: Composite resin restorations, dental esthetic, discoloration, peg lateral, veneering.

I. Introduction

Re-establishing a patient's lost natural dental esthetics is among the important topics of today's dentistry, in addition to function and phonation. Colour, shape, and structural and position abnormalities of anterior teeth might lead to important esthetic problems for patients.^[1] In order to solve such problems, Various treatment modalities are available for the treatment of anterior teeth. The whole spectrum of aesthetic procedures embraces four different types of treatments (Dietschi, Devigus, 2011). 1) Non-invasive - Bleaching, microabrasion, orthodontics. 2) Minimally-invasive - Direct composites, enamel recontouring. 3) Micro-invasive - Veneers, inlays and onlays. 4) Macro-invasive - Crowns and bridges.^[2]

Veneer is a layer of material placed over a tooth, either to improve the aesthetics of a tooth or to protect the tooth's surface from damage. Veneer restorations have two different types: direct and indirect veneers. The use of directly applied resin composite to restore worn teeth was first described by Bevenius *et al.* in this method direct composite resin is applied on prepared tooth surfaces. Among all the treatment options direct composite veneering have few advantages like- Preserve sound tooth structure (Inzgi 2005), placed directly onto the tooth surface, easily change the emergence profile and angle, alter the shapes and length of the tooth, repaired easily and can be polished and repolished to a high shine, long lasting, inexpensive option. But it has few disadvantages like chip and break easily, discolouration after aging, marginal leakage due to polymerization shrinkage (Walls 1988) which may result in estimated longevity of the restoration of 4 to 8 years, pick up stain easily in those patients who smoke and have poor oral hygiene.(Walls 1988). But successful esthetic and functional results are dependent primarily on the operators understanding of adhesive technology and components of the colour, including their relationship to natural tooth structure and composite resin restorative material.^[3]

Direct composite additions or direct composite veneers have often been heralded as a more conservative alternative to porcelain, and with the advent of microhybrid and nano-hybrid composites, the finishing and polishing of these restorations can rival that of porcelain (Fahl, 2000; Fahl, 2007). In 1997, Lambrechts *et al* found an 89% success rate in terms of aesthetics of direct composite additions to maxillary anterior teeth after five years and the aesthetics and durability of these materials has improved dramatically since then.^[2] Therefore, direct laminate veneer restorations have been developed for advanced esthetic problems of anterior teeth. Tooth discolorations, rotated teeth, coronal fractures, congenital or acquired malformations like peg shaped laterals, diastemas, discoloured restorations, palatally positioned teeth, absence of lateral incisors, abrasions and erosions are the main indications for direct laminate veneer restorations.^[4]

In this case series, direct composite laminate veneer technique, used for three patients with esthetic problems related to peg shaped laterals, discolorations (flurosis) and diastemas, is described and success in 1 year follow-ups is discussed.

II. Case Presentation

2.1) CASE -I

25 years old female patient reported to the department having a chief complain of poor facial appearance while smiling due to discoloured teeth in upper front region since childhood. Similar teeth staining history was present with her brother and sister. There was no history of tetracycline intake in childhood and chewing habits. Medical history was not significant.

Examination revealed moderate brown stained enamel surfaces in all teeth with a good periodontal status. Class III caries were present mesially on both maxillary central incisors. Both the maxillary lateral incisors were peg shaped. "Fig-1 A" On electrical and thermal pulp testing all maxillary incisors showed normal vitality response. On radiograph, radiolucency seen in coronal aspect of both central incisors involving enamel and dentin. Temporomandibular joint was asymptomatic. Facial profile was bilaterally symmetrical without any proclination.

Differential diagnoses were- dental fluorosis, idiopathic stains, discoloration from tetracycline and hypoplasia was formed. Final diagnosis of dental fluorosis classified as Dean's moderate type with peg shaped laterals was reached. The treatment options included the use of vital bleaching, microabrasion, direct resin composite veneering, porcelain veneering and full coverage prosthesis. In order to convince the patient, virtual central and lateral incisors were build according to golden mean proportion using computerised software "Fig-1 B" and diagnostic casts were prepared and mock up with wax was done "Fig-1 C". Based on discussions with the patient about treatment plan, resin composite veneering with minimal tooth preparation was planned.

Before beginning with the procedure, a palatal silicone putty index (DMG America) was made. It was made to assist in guiding the application of the first palatal composite layer. Supragingival scaling followed by shade selection was performed. Isolation of the operating area was achieved with cotton rolls as patient was experiencing gagging with rubber dam and gingival retraction cord was placed. Caries was removed from both the central incisors using round carbide bur and spoon excavator. Then both maxillary centrals were prepared for direct composite veneering without incisal lapping and lateral incisors were minimally prepared with a coarse diamond bur "Fig-1 D". A light chamfer finish gingival margin line was given and the preparation cleaned, water washed and dried. The preparation was etched -with 37% phosphoric acid for 30 seconds, rinsed with water and air dried. The adjacent tooth was separated by using Mylar strips. A single layer of bonding agent (Tetric N Bond, Ivoclar Vivadent) was applied according to the manufacturer direction and cured for 20 seconds with the LED composite curing unit. A thin layer of nanohybrid composite (Tetric N Ceram, Ivoclar Vivadent) was incrementally applied to the tooth surface and light cured for 40 seconds. Finally shaping was done with afluted carbide bur on the facial surfaces, excess was removed and contouring at the gingival and labial margin performed. Finishing, contouring and polishing were done with a super snap mini kit (Shofu) and composite polishing paste "Fig-1 E". After completing the procedure Oral hygiene instructions were given. And patient was recalled after 1 week, 6 months and 1 year for follow up "Fig-1 F".

2.2) CASE -II

28 years old female patient came to the department having a chief complain of one small tooth in upper front region since childhood and spacing between 2 upper front teeth. There were no significant Family and medical history present.

Intra oral examination revealed peg-shaped upper right permanent lateral incisors. Midline Diastema was present between both the central incisors of 1mm "Fig-2 A". Patient had good periodontal health and a stable intercuspal position, normal vertical and horizontal overlap, and canine-protected guidance and mucosal frenum attachment. Radiographic examination revealed peg shaped lateral incisor with normal root length.

The peg-shaped lateral incisor and midline diastema was restored with direct resin composite veneers using the same technique described in case I "Fig-2 B & C". Oral hygiene instructions were given. And patient was recalled after 1 week, 6 months and 1 year "Fig-2 D".

2.3) CASE -III

35 years old female patient reported to the department having a chief complain of spacing between all the upper front teeth. Medical history was not significant.

A thorough clinical examination was then carried out to find uneven spaces between maxillary central incisors and between lateral incisors and canines on both right and left sides. Meanwhile, small spaces were present in between the mandibular anterior teeth which were not appreciable during speech or smiling. The widest interdental space was between two central incisors approximately 1.5 mm in size. Overjet and overbite were found to be normal "Fig-3 A & B".

Diagnostic impressions of both the arches were made and wax mock-up was done and shown to the patient “Fig-3 C”. She was explained about the treatment and was not willing for restorations on her mandibular anterior teeth. A palatal silicone putty index (DMG America) was made. Restorative procedure was carried out as describe in case I “Fig-3 D”. Although the space of 1.5 mm or less can be successfully restored using a relatively translucent enamel shade, multiple shades/opacities of resin composites were utilised to accurately match not just single shade, but also the adjacent tooth structure. After completing the procedure oral hygiene instructions were given. Patient follow-up was done at one week, then after 6 month and 1 year “Fig-3 E”.

III. Figures



Figure 1 – A) Preoperative intra oral photograph, B) Computerised mock up according to golden proportion, C) Mock up on cast with palatal silicone putty index, D) Tooth preparation for veneering, E) Post operative intra oral photograph, F) 1 year follow up.

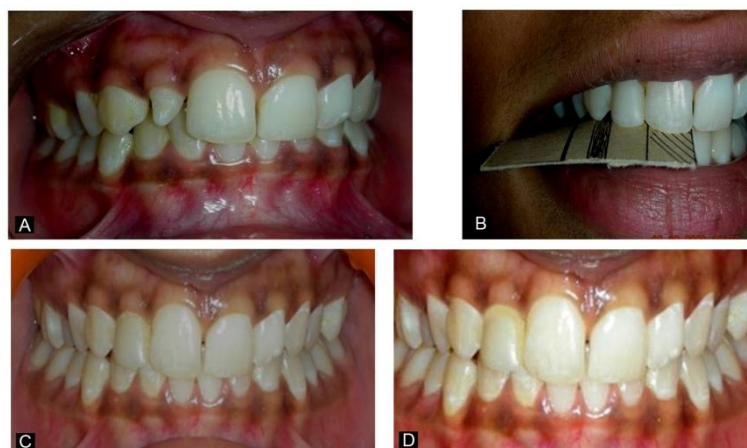


Figure 2- A) Preoperative intra oral photograph, B) build up done according to golden proportion, C) Post operative intra oral photograph, D) 1 year follow up.



Figure 3- A & B) Preoperative intra oral photograph, C) Mock up according to golden proportion, D) Post operative intra oral photograph, E) 1 year follow up.

IV. Discussion

Maxillary anterior teeth malformation such as enamel hypoplasia, peg shape laterals can present esthetic problems. Such situations also can demand expeditious treatment from a psychosocial point of view^[5].

Discoloration due to flurosis can affect both vital and non vital teeth. Vital teeth may be discoloured at the time the crown formation. First choice is vital bleaching which can be done in superficial staining; it does not however respond in case of severe intrinsic stains. Its main disadvantage is prolonged sensitivity because of the increased intra-pulpal temperature and inflammatory changes associated with use of hydrogen peroxide. In cases of severe dental flurosis the tooth enamel usually becomes porous and tooth whitening methods are not recommended as treatment. Treatment for severe cases of flurosis requires covering the affected teeth with restoration, such as composite veneering / porcelain and full coverage are crowing. In this case we discuss the ability of a minimally invasive technique using a direct composite veneer to remove the flurosis induced browns spots in an esthetic and functional manner. Direct composite veneers also have high patient satisfactory rate because they can be replaced in one day, therefore giving immediate results with minimal preparation (IDATM, 2006)^[6]. Whereas ceramic veneers are more expensive as they involve custom impression in the dental office and custom fabrication by a dental laboratory technician which is time taking.

A peg lateral is defined as “an undersized, tapered, maxillary lateral incisor” that may be associated with other dental anomalies, such as canine transposition and over-retained deciduous teeth. Individuals with malformed lateral incisors often display a diastema in the midline region caused by the distal movement of the central incisor due to small size adjacent tooth.^[7] The incidence of peg-shaped incisors was found to be 0.8% in 739 children^[8]. In another study, it was found to be 0.4%^[9]. The treatment includes 2 primary objectives: to restore or replace, and to close the diastemas. If the patient does not smoke or drink dark-coloured liquids that can alter the colour of the teeth^[7], esthetic bonding with resin composite may be the most conservative approach in comparison to all-ceramic restorations, resin composite does not have the potential for catastrophic brittle fracture, nor does it cause abrasive wear of the opposing dentition as seen in porcelain crowns.^[10-12]

The presence of a midline diastema or spaces in between anterior teeth can be a major esthetic concern for patients. There are various treatment options available for diastema closure in adults like orthodontic movement, restorative and prosthodontic treatment. Amongst these, the use of direct resin restorations seems to be conservative and more practical^[13].

In this case report patient's esthetic expectations were successfully met through conservative direct composite resin restorations.

V. Conclusion

Direct composite veneer provides good esthetic result at the lesser cost and time due to absence of laboratory procedure and completion of work in single appointments. This minimally invasive technique is a better option in treatment of dental flurosis, peg laterals and midline diastema compared to full crown.

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