Aesthetic management of enamel hypoplasia in maxillary lateral incisor with prefabricated composite veneer

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Abstract

Enamel hypoplasia is a developmental defect that occurs due to disturbances in enamel matrix formation. Disorders occurring during developmental and maturation stages of enamel can lead to reduced enamel thickness that can result in depressions and fissures in the surface of enamel. The characteristics of enamel hypoplasia may be depressions, grooves and surface cracks in the enamel. This case report presents a conservative restorative treatment of enamel hypoplasia using prefabricated composite veneer to mask color changes and defects of enamel of the maxillary lateral incisor.

Keywords: *Enamel hypoplasia, Enamel defects, Composite veneers*

Introduction

Aesthetics in dentistry is more of subjective than objective concern and it mainly relates to the patient needs. Dental structures can be reproduced along with proper form and function by the use of new restorative materials and new techniques making it difficult to perceive any restorative procedure.[1,2] Aesthetically compromised teeth may have additional clinical situations that may be unfavorable and can lead to deep invasion of mineralized tissue. An ample knowledge of recently available restorative materials and techniques is required to depict the optical properties of teeth (viz. translucency, fluorescence etc.)[3, 4]. Defects of tooth enamel may have wide range of etiologies including systemic, local and environmental factors.[5] The quality and quantity of enamel may be affected by any disturbance during its formation which in turn depends upon the phase of enamel formation that has been affected and, the duration for which stimulus was subjected to ameloblasts.[5] Enamel hypoplasia is a sequel to these disturbances during enamel matrix formation. The characteristics of enamel hypoplasia may be depressions, grooves and surface cracks in the enamel.

This case report presents a conservative restorative treatment of enamel hypoplasia using prefabricated composite veneer to mask color changes and defects of enamel of the maxillary lateral incisor.

Case Report

A 22 year old female patient reported to department of conservative dentistry with major complaint about unaesthetic appearance of her smile due to discoloration and surface irregularity in maxillary anterior tooth (Fig. 1). History and clinical examination revealed an enamel defect with irregular surfaces in the maxillary lateral incisor of second quadrant that was present since eruption of the tooth. Patient's dental as well as medical history was otherwise insignificant. The clinical status of tooth revealed it to be enamel hypoplasia. A restorative procedure was required to restore its aesthetics and function. After explaining all the available treatment options (viz. composite veneers, ceramic veneers, ceramic laminates) to the patient, prefabricated composite veneer (componeer) were decided as the most reliable option for this case due to their virtue of mimicking better optical characteristics and better surface finish.

Patient's oral hygiene and periodontal condition were excellent. The dentin shade selected from the Synergy D6 color guide was A1/B1, while the enamel shade was white opalescent. With the help of the contour guides, size "L" was selected. Teeth were prepared using a round diamond bur

(Fig. 2). The prefabricated veneers were customized with abrasive discs (Swiss Flex, Coltene) and tried-in. One Coat Bond was applied to the intaglio and left undisturbed without light-curing. After the preparations were etched with 35% phosphoric acid for 15 seconds, the etchant was thoroughly rinsed for 20 seconds (Fig. 3). The bonding substrate was gently air-dried followed by the active application of One Coat Bond for 15 seconds. The adhesive was then gently air-dried from cervical to the incisal aspect and light-cured for 20 seconds. An opaquer (Paint-on Color, Coltene) was applied to mask the discolorations of tooth (Fig. 4). After the masking agent was light-cured for 40 seconds, Synergy D6 dentin composite was applied on to the tooth surface (Fig. 5), while the enamel composite was applied on the intaglio surface of the veneers). The prefabricated veneer was gently placed (without excessive pressure). The restoration was then aligned with the proximal and the incisal position was double-checked for symmetry. The spaces are created between the composite shell and the tooth structure; they are filled with the same enamel hybrid composite resin used to seat the prefabricated composite shells. While holding the veneers in position, the obvious excess was removed and the composite smoothly adapted to the Componeer with a sable brush. The entire restorative complex was then light-cured from the lingual side for at least 40 seconds, and from the facial side for 40 seconds cervically and 40 seconds incisally (Fig. 6 & 7). For the finishing steps, the margins can be adjusted with Proxoshape oscillating diamond-coated files (Intensive SA, Montagnola, Switzerland). Finishing and polishing strips were used for the interproximal areas. Flexible aluminum oxide discs are ideal to adjust the incisal angles. Silicone rubber polishers (prepolishers and polishers or two-stage polishers) were used for the polishing steps (Fig. 8). After 6 months of follow up, patient was completely asymptomatic and satisfied with her esthetic appearance. (Fig. 9)

Fig. 1: Initial clinical aspect showing hypoplastic alteration of maxillary lateral incisor

Fig. 2: After tooth preparation with diamond bur

Fig. 3: After acid etching with 35% phosphoric acid

Fig. 4: Application of opaquer on tooth surface

Fig. 5: Dentine composite application on tooth surface

Fig. 6: Light curing of composite on tooth surface

Fig. 7: Placement of componeer on tooth surface (before finishing)

Fig. 8: Placement of componeer on tooth surface (after finishing)

Fig. 9: 6 Months follow up

Discussion

Minimal intervention in restorative dentistry is providing extension of current philosophy of conservation of tooth structure with increasing demand of aesthetics.[1,6] Numerous adverse clinical conditions can be encountered while dealing with aesthetically compromised teeth that may sometimes lead to deep invasion of mineralized structures. The presence of irregularities in enamel hypoplasia may facilitate plaque retention leading to early decay of tooth by deep progression into enamel and dentine.[7] Enamel hypoplasia is defined as defective organic matrix formation of enamel and increased susceptibility to decay for remaining areas, which form major portion of lesion. Hypo plastic lesion can be characterized by reduced enamel luster, erosion and cavitation of tooth surface caused by lost microanatomy affecting color and texture of tooth. Enamel hypoplasia may sometimes be misdiagnosed as dental fluorosis but, it is defective organic matrix formation of enamel that may have etiology of trauma or infection of deciduous pulp tissue or some systemic disorder.[6] Enamel hypoplasia can cause partial or complete loss of enamel that may be systemic(affecting multiple teeth) or local(affecting single tooth).[6] Optical characteristics similar to enamel are very difficult to reproduce but optical properties similar to natural teeth have been shown by some modern

composites with acceptable level of hue, value and chroma.[3,4] Several treatment modalities are available according to severity of lesion. Different available approaches are micro abrasion, tooth whitening and aesthetic restorations.[6,8] Different shades and opacities of composite resins are available simulating optical characteristics of enamel and dentin. The greatest advantage of direct composite veneers is reduced patient appointments since no impression is required as in laboratory processed veneers. Many clinical studies have discussed the success of composite resin as direct veneer. However problems of wear and marginal and surface discoloration have been reported in direct composites[8-10]. Surface quality changes were more frequently observed in the composite veneer material, which required maintenance over time.[13]

Ruston et al[2] described a minimal intervention procedure for enamel hypoplasia based on enamel micro abrasion followed by direct composite resin restoration but it may cause staining. Clinical studies have confirmed good performance of porcelain veneer restorations, with excellent esthetics, overall patient satisfaction, and no adverse effects on the periodontal tissues[11]. A recent study[12] evaluated 318 ceramic veneers in 84 patients over 10 years. The estimated survival probability was 93.5% at 10 years. Whereas the main reason for failure was fracture of the ceramic, increased failure rates were associated with bruxism and non-vital teeth. No significant differences in absolute failures were found between indirect composite veneers and ceramic veneers at up to 36 months.

Indirect composite veneers were found easy to finish and polish with possibility of modifications without compromising their adhesive or mechanical properties. Prefabricated composite veneers have advantages of single session procedure similar to direct composite restorations. Customization of the restoration and affordability are additional advantages compared to alternative indirect restorations, resulting in very esthetic outcome[14]. All these advantages of prefabricated composite veneers along with the level of results were also observed in the present case.

Conclusion

In conclusion, this case report demonstrates a non-invasive treatment of hypo mineralized lesion of tooth providing an immediate favorable aesthetic appearance along with optical properties of tooth and moreover boosting patient's self-esteem.

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