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ESTHETIC REHABILITATION OF DISCOLORED MAXILLARY ANTERIORS WITH MINIMALLY INVASIVE PORCELAIN LAMINATE VENEERS – A CASE REPORT

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ABSTRACT

Discoloration and the surface defects are the most common challenges encountered by the clinician in a day to day practice. Discolored anterior teeth are an integrated part of facial esthetics and have a major impact on the social, cultural and psychological interaction. Achievement of an optimal long-term esthetic result in such cases needs careful diagnosis, visualization of the final outcome followed by comprehensive treatment planning with minimally invasive technique. It is important to understand the self-perceived opinion of the patient in the treatment planning and sometimes two or more treatment options are combined for a more successful outcome.

KEYWORDS: Porcelain laminate veneers (PLV), Discolored teeth, Esthetics, Minimal preparation.

INTRODUCTION

Discoloration may be limited to a single tooth or several teeth in a single arch or it may be generalized. Treatment options for such conditions include bleaching, micro-abrasion, cosmetic-contouring, complete crowns and laminates. Among them Porcelain laminate veneers (PLV) is one of the most successful, conservative and feasible alternatives to restore teeth with high esthetic demand. This Case report aimed to describe prosthetic rehabilitation with PLV for the patient with discolored maxillary anteriors to restore esthetics and function. The patient was very satisfied with the final outcome and had no complaints during 1 year of follow-up.

CASE REPORT

A 32-year old patient reported to our clinic with the chief complaint of discolored upper front teeth and wanted cosmetic rehabilitation. She was of average built, normal gait and stature and showed characteristic feature of a reduced social interaction and general confidence. She was displeased with her smile and was also habitual in hiding her mouth during the smiling due to discoloration.

A thorough history, diagnostic impression and radiographs were taken. Intra-oral examination showed a high lip-line exposing the maxillary teeth and continuous band of gingiva on smiling (Figure 1). Patient had no sensitivity to hot and cold.

A provisional diagnosis of enamel hypoplasia due to moderate flourosis was made.

Many options were available in choice of restorative material. In this case, it was decided to treat with an IPS Empress all ceramic laminates. (IPS E.max Press, Ivoclar Vivadent). Patient was informed about the treatment procedure, precautions to be taken and consent was taken.

Figure 1: Intra-oral examination showed a high lip line exposing the maxillary teeth and continuous band of gingiva on smiling.

Figure 2: A smooth preparation free of sharp internal line-angles to avoid the stress concentration within the ceramic.

Figure 3.a: Multilink® N system used for cementation.

Figure 3.b Multilink® N system used for cementation.

Figure 4: The mixed Multilink® Primer A/B in 1:1 Ratio.

Figure 5.a. IPS Ceramic etching gelAfter that the air is blown to evenly spread on the surface of the laminate. The laminate is now ready for the cementation Variolink-NLC Automix (Figure 10) is dispensed from the automix syringe.

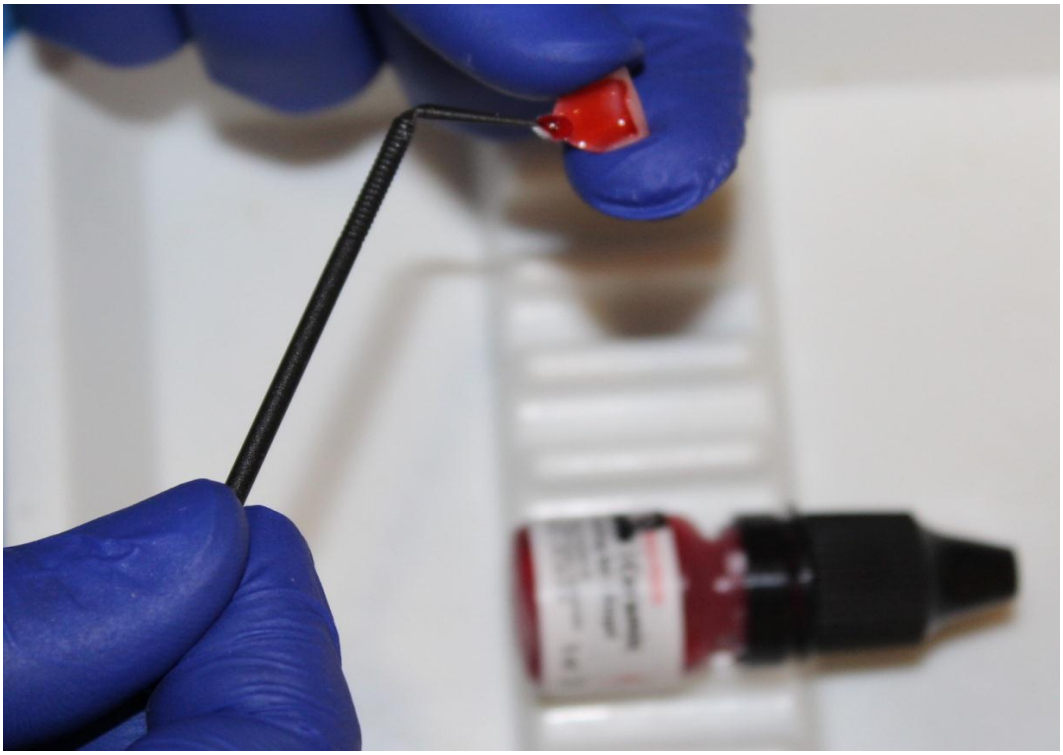

Figure 5.b: The cementing surface of the laminate is etched with 5% hydrofluoric acid (IPS Ceramic etching gel) for 20 seconds.

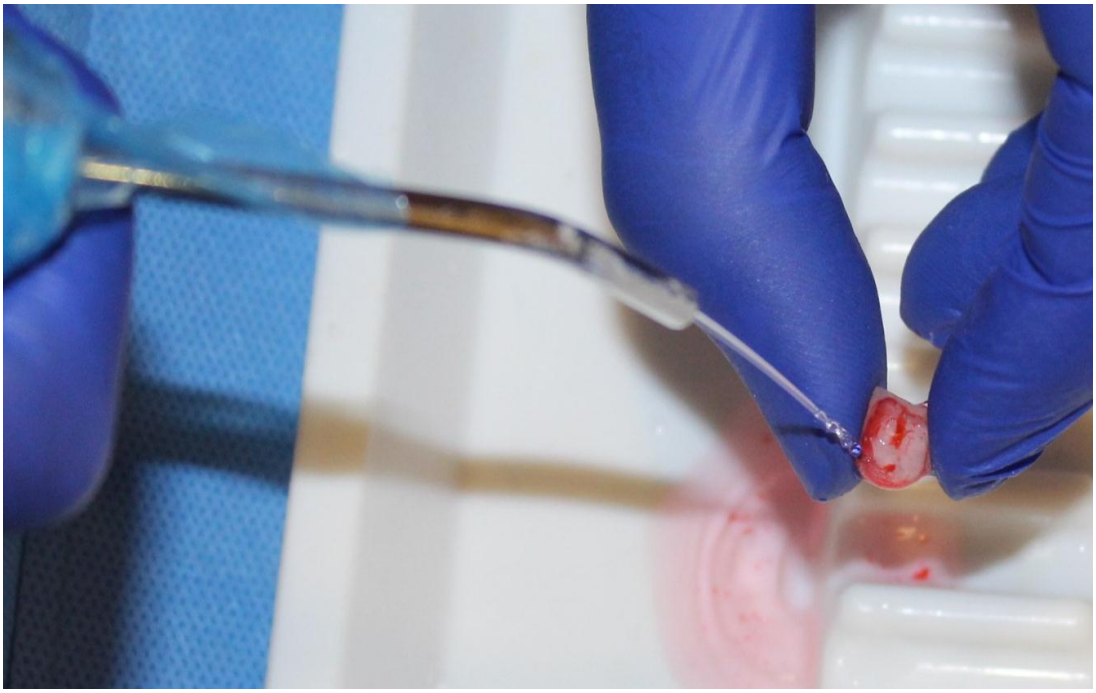

Figure 5.c: Laminate is rinsed thoroughly and then gently air dried.

Figure 6: The application of primer agentto the fitting surface and remained to stay for 1 minute (Monobond -N, Ivoclar Vivadent).

Figure 7: Variolink-NLC Automixis dispensed from the automix syringe and directly loaded on the restoration.

Figure 8: After the complete setting of the cement the margins were finished with ceramic finishing kit.

Figure 9: Occlusion is carefully checked initially with centric occlusion followed by other excursive movements.

Procedure

The preparation was carried out according to the standard principles required for all ceramic veneering.

Labial reduction

The depth orientation grooves were placed horizontally perpendicular to the long axis and in two planes (cervical 3rd and incisal 2/3rd). The enamel was then removed

between the grooves to achieve the required uniform depth. A careful labial reduction was done to provide a minimum of 0.3-0.6 mm thickness.

A minimal preparation of 0.5 mm was used to allow a place for PLV, be able to get the desired esthetics or to mask unaesthetic areas.[1]

Incisal preparation
1.5-2 mm reduction was performed over the incisal edge and was extended to the palatal surface to give wrapped-around preparation to protect the palatal surface and cover the incisal edge with restoration.

The wrapped-around preparation provide an excellent esthetic outcome involving color and morphology modifications to create a life-like appearance.[2]

The main rule to respect is to avoid the palatal extension in the zone of palatal concavity due to the maximum tensile stresses generated during loading.[3]

Interproximal preparation
The adjacent tooth was protected with a metal matrix. Care was taken to ensure that the tooth- restoration interface was hidden and the preparation was kept just short of breaking the contact as the contour of the tooth does not need to be changed.

Finish Line
The gingival finish line was taken subgingivally after retraction of the gingiva to mask the dark staining in the cervical region and to attain emergence profile of the tooth. A chamfer finish line was made and was kept restricted to the labial surface as no change of anatomy was required. The lingual finish line was maintained 1mm away from centric contacts.

The veneer extended onto the lingual surface will enhance mechanical retention and increase the surface area for bonding.[4]

Finishing the prepared surface
The preparation was finished with finishing burs and pumice abrasive paste. A smooth preparation which was free of any sharp internal line-angles was made to avoid the stress concentration within the ceramic (Figure 2).

Impression making
The final impression was made with polyvinyl siloxane impression material using putty wash technique, after gingival retraction (Kerr Expasyl material). Since the preparation remains in enamel, a provisional restoration was not planned in this case.

Try in
The teeth were cleaned with slurry of pumice and rubber cups and were dried. The veneers were tried to verify their color and fit that simulated the final shade of restorations. After try-in, the restoration was dried with oil free air.

Cementation
Multilink N system was used for cementation (Figure 3.a, 3.b). Isolation was done with cellophane strips and cotton rolls. The mixed Multilink Primer A/B (1:1 Ratio) (Figure 4) was applied on the entire bonding surface of the teeth using a microbrush and allowed to set for 30 seconds. Excess Primer was dispersed with air until the mobile liquid film was no longer visible.

The cementing surface of the laminate was etched with 5% hydrofluoric acid (IPS Ceramic etching gel) for 20 seconds (Figure 5.a,5.b) and then rinsed thoroughly with water and then gently air dried (Figure 5.c). The bonding agent (Monobond -N, Ivoclar Vivadent) was applied on to the fitting surface of the laminate and the air was blown gently to spread it evenly and remained to stay for 1 minute (Figure 6).

Variolink-N LC Automix (Figure 7) was dispensed from the automix syringe and directly loaded on the restoration, taking care not to incorporate any air bubbles. The restoration was gently placed maintaining stable pressure till it was completely seated till the finish line. Partial curing was done for 3-4 seconds at a distance of 10 mm to remove the excess cement with a perio-scaler using the quarter technique. Excess cement was light-cured with a polymerization device. In order to prevent oxygen inhibition, the restoration margins were covered with glycerine gel immediately after the removal of excess. Subsequently, all cementation joints were completely light-cured for 20 seconds.

Finishing and polishing
After the complete setting of the cement the margins were finished with ceramic finishing kit (Figure 8). Centric occlusion followed by other excursive movements was checked (Figure 9). The patient was given all the instructions necessary for the proper maintenance of the laminate.

DISCUSSION

The use of PLV is known to be a durable treatment modality to solve aesthetic and functional problems especially in the anterior aesthetic zone. They are esthetically superior, conservative as it requires minimal tooth preparation of approximately 0.5-0.7 mm of surface enamel reduction. Therefore it is considered as more conservative restoration than a crown, which requires significant removal of sound tooth structure.[5,6] When a porcelain veneer restoration is bordered on all margins by enamel, microleakage or debonding of these restorations is not likely to occur.[7]

The introduction of new dental technology, high strength adhesive systems and reliable resin cements simplified the cementation procedures, enabling the promotion of

this effective treatment approach among the dentists which has shown excellent retention rates to date.[8]

Light-polymerized resin-based cement is preferred for thin laminate veneers because of the increased working time.[9] The color and integrity of dental tissue substrates to which veneers will be bonded are important for clinical success.[10]

Using additional veneers with a thickness between 0.3-0.5mm, 95-100% of enamel volume remains after preparation and no dentin is exposed. Ideally, 0.3mm thickness is required for each shade change.[11]

With veneers thicker than 1.5mm, the polymerization of light-polymerized cements may be jeopardized, depending on the type and opacity of the ceramic.[12]

The final success of functional and/or esthetic treatments is only achieved when the patient is well informed and motivated to maintain good oral hygiene.

CONCLUSION

PLV used for anterior discolored teeth provide an excellent esthetic outcome involving color and morphology modifications to create a life-like teeth appearance with pleasant smile and minimal tooth preparation.

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