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Midline Diastema: Treatment With Resin Based Direct Restorative

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Abstract: *Maxillary anterior spacing is one of the major concern issues among the adults. The treatment of this is mainly attributed due to esthetical and psychological reasons. The purpose of this case report is to present the clinical management of midline diastema in the upper anterior region with the help of resin based direct restorative in a healthy adult.*

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I. Introduction

Midline diastema refers to anterior midline spacing between the two central incisors of more than 0.5mm [1].Midline diastema can be physiological, dentoalveolar, due to a missing tooth, due to peg lateral, midline supernumerary teeth, proclination of the upper labial segment, prominent frenum or due to a self-inflicted pathology by tongue piercing [2]. There are wide variations of perception in different cultures and ethnic background. During the early mixed dentition this condition appears in 48.8% of children and decreases with age. In adults, the prevalence of maxillary midline diastema ranges from 1.6% to 25.4% [3].

II. Case Report

A healthy male aged20 years, presented with a complaint of spacing in the upper front teeth for 2 years when he first noticed space in upper anterior region (Fig.1 & 2). Patient's medical history did not reveal any systemic diseases and intraoral examination revealed presence of midline spacing between maxillary central incisors. On intra oral examination, no caries or sinus was observed and on extra oral examination, no significant findings were noted.

Figure 1: Intraoral Facial View Showing Midline Diastema Wrt 11 And 21

Figure 2: Intraoral Palatal View Showing Midline Diastema Wrt 11 And 21

Treatment plan- As a more conservative, economical, aesthetic, and quicker option, direct aesthetic partial composite laminate veneers as build-ups for both maxillary central incisors were considered.

III. Procedure

The topical anesthesia was administered with Lido jelly 2%-GCPC (2% lidocaine Hydrochloride) followed by infiltrating anesthesia of Xylestesin- A (2% lidocaine with epinephrine 1/8000; Espe, seefeld, Germany) in small amount. Analgesics were not given since no postoperative discomfort was expected.The tooth surfaces were cleaned with slurry of fine pumice. Enamel and dentin shades were determined to accurately match with the adjacent tooth structure. The restorations were done taking one incisor at a time. The teeth were isolated with rubber dam (Fig.3). The enamel was cleaned and roughened by airborne-particle abrasion with 27 µm aluminum oxide powder. The uncut enamel was then etched for 30 sec. with 37% phosphoric acid,rinsed for 20 sec. with air/water spray and lightly air-dried. A filled ethanol-based adhesive system (Optibond FL, Kerr, Orange CA, USA) was applied to the etched enamel and light polymerized for 20secs, methacrylate-based nano-hybrid composite was used for the composite build-ups. Firstly, athin layer of palatal/lingual enamel (TetricEvo Ceram A3, Ivoclar Vivadent, US) was carefully shaped with transparent material using the silicone mold as a guide. This layer was then light cured for 15 sec. In order to avoida translucent shine-through-effect, a small amount of opaque dentin shade (TetricEvo Ceram A3, Ivoclar Vivadent, US) was added on the proximaland incisal part, leaving space for subsequent characterization in this area. Therefore, a more translucent shade (TetricEvo Ceram Bleach m) was added characterizing the incisal edge. A single layer of a lighter shade of enamel(TetricEvo Ceram A2, Ivoclar Vivadent, US) was applied onto the incisallabialand incisal-proximal surfaces. Each restoration wasthen fully light-polymerized for 60 sec. from multiple directions. Excess material was cut and removed with the aid of a size 12 scalpel and interproximal finishing was done with finishing strips. Further finishing was carried out with red diamond burs and abrasive discs (Soflex, 3M Dental Products, St. Paul, Minnesota, USA) in order to create a surface macro- and micro texture. Final polishing was accomplished with silicone-impregnated polishing devices (Brownie/Greenie Shofu, Kioto, Japan). At this stage the incisal adjustment was also performed. (Fig. 4,5,6).

Figure 3 Preoperative picture with rubber dam isolation w.r.t. 11, 21.

Figure 4: Post-operative clinical photograph w.r.t 11 and 21

Figure 5: Post-operative facial view showing closure of midline diastema

Figure 6: Post-operative palatal view showing contact between 11 & 21

IV. Discussion

The Treatment For Midline Diastema Depends On The Basis Of Etiology [4]. The some of the common cause of midline diastema can be labial frenulum, microdontia, mesiodens, peg-shaped lateral incisors, lateral incisor agenesis, cysts in the midline region, habits such as finger sucking, tongue thrusting and/or lip sucking, dental malformations, genetics, maxillary incisor proclination, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum [5].Diastemas can be closed orthodontically or restoratively. Restoration includes porcelain laminate veneers, composites, metal free ceramic crowns, and by metal ceramic crowns. The resin based restorations are preferred over orthodontic treatment and porcelain crowns as they can be done in a single visit and no laboratory techniques are needed in this. They are much more cost effective than the other treatment options. Some added advantages that these restorations have over other common treatment modalities are that (a) they are gentle towards the opposing dentition, unlike ceramic materials and (b) they are easy to repair in case of fracture. With porcelain restorations, any modification means a return-trip to the laboratory for correction[6]The composite resins used for anterior restorations must demonstrate good handling (nonsticky and nonslumping) and aesthetic (polishability) characteristics. Few commercially available resin composites (e.g., Estelite Sigma, Tokuyama [Tokyo, Japan]; Filtek Supreme Ultra, 3M ESPE [St. Paul, MN]; Premise, Kerr [Orange, CA]; Renamel Microfill, Cosmedent [Chicago, IL]) are well suited for this purpose [7]. Also, they should contain a high filler content by volume (>65%) and particle size smaller than 5μm [8].In contrast to other treatment alternatives, composite restoration can be easily repaired if there is any cases of fracture observed in a long term follow up so there is the possible need for multiple replacements during the lifetime of the patient [9]. Although direct resin restorations are considered to be stable, the color stability of ceramic restorations is still much better so in order to overcome this issue, the best solution is regular follow ups with proper finishing and polishing is advised [10].

V. Conclusion

Presence of midline diastema is a common aesthetic problem in adults. There are many innovative treatment procedures available varying from restorative buildup, porcelain veneers toorthodontic approach. Composite restorations are very conservative, less time consuming and mimic the natural tooth structure. The cost of treatment is very less in comparison with other treatment options like orthodontic treatment, veneers and crown. The time taken to close the gap is also very less as it can be done in a single visit when compared to other treatment option like indirect veneer and crowns which cannot be done in single visit and requires minimum of two to three visits whereas orthodontic treatment will take around few months to years. Thus, the resin based direct restoratives are more useful criteria according to esthetics, time as well as finance.

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