

## **Interdisciplinary approach to smile designing**

**Dr. Sheetal Parab**

**Associate Professor, Department of Prosthodontics, D.Y. Patil Deemed to be University  
School of Dentistry , Navi Mumbai**

**Dr. Rajeev Singh**

**Professor and PG Guide, Department of Prosthodontics, D.Y. Patil Deemed to be  
University School of Dentistry , Navi Mumbai**

**Dr. Swapnita Vaity**

**Lecturer, Department of Prosthodontics, D.Y. Patil Deemed to be University School of  
Dentistry , Navi Mumbai**

**Dr. Ashmita Chabria**

**PostGraduate Student, Department of Prosthodontics, D.Y. Patil Deemed to be  
University School of Dentistry , Navi Mumbai**

**Dr. Simran Khan**

**PostGraduate Student, Department of Prosthodontics, D.Y. Patil Deemed to be  
University School of Dentistry, Navi Mumbai**

**Dr. Saloni Shah**

**PostGraduate Student, Department of Prosthodontics , D.Y. Patil Deemed to be  
University School of Dentistry , Navi Mumbai**

### **Abstract**

A midline diastema is a space between the central incisors of the maxilla. Midline diastema can result from a number of factors. Proper history-taking and accurate diagnosis of the aetiology of the diastema is crucial to ensure that the prosthodontic treatment is successful and there is no relapse. Veneers are now among the most effective treatment options for diastema closure, thanks to significant evolution and development. This paper Presents a case report on Diastema closure using Porcelain Laminate Veneers.

**Keywords: Frenectomy, diastema, veneers, crown lengthening**

### **Introduction**

A space between the maxillary and, less frequently, the mandibular central incisors characterise the dental midline diastema, which Angle describes as a somewhat common type of incomplete occlusion. Hypertrophic labial frenum causes maxillary midline diastema frequently. When the labial frenum is attached to the notch in the alveolar bone, a band of

dense fibrous tissue may develop between the central incisors, which might result in a maxillary midline diastema<sup>1</sup>.

It can be difficult in clinical practise to treat diastema closure aesthetically. Porcelain laminate veneers (PLVs), which are thin ceramic shells that may be bonded to the labial surfaces of anterior teeth using modern bonding agents and dual cure cements, are one of the most popular treatment choices for such clinical conditions<sup>2</sup>. With minimal tooth preparation required, this treatment is incredibly conservative and produces great aesthetic results. These acquire the strength of enamel when they are bonded to enamel and match the strength of the original tooth structure<sup>2</sup>. The majority of individuals do not want to spend several years and numerous appointments to improve their smiles, even though orthodontic treatment is a viable alternative. Any of the methods mentioned composite veneers, indirect composite veneers, porcelain laminate veneers, all-ceramic crowns, metal ceramic crowns, and composite crowns—can be used to restore the closure of a diastema<sup>2</sup>. Glass ceramics known as lithium disilicates are currently advised for porcelain laminate veneers (PLVs) due to their capacity to generate thin layers, which increases their translucency and aesthetics. In cases of anterior dental wear, discolouration, slight changes in tooth contour, diastema closure, and sufficient remaining sound tooth structure, ceramic veneers are recommended<sup>3</sup>. Etched porcelain veneer restoration has gained popularity since it was first introduced more than 20 years ago and has established itself as a reliable and attractive form of care<sup>4</sup>.

## **Case Report:**

A 30-year-old male patient named Mr. Siddhesh, reported to Department of Prosthodontics, Crown and Bridge, D. Y. Patil University, School of Dentistry, Navi Mumbai. Patient's chief complaint was spacing in the upper front teeth and an unhappy smile. On examination, spacing was seen between the upper central incisors and lateral incisors 21,22,11,12 (fig.1). Abnormal frenal attachment (figure 2) was seen labially which may have caused the midline diastema. Frenectomy and crown lengthening procedure followed by veneers was planned for the patient. The entire treatment plan was explained to the patient and he agreed for the same. High frenal attachment was the cause of diastema, therefore frenectomy was planned (figure 3.).

Width of the diastema was 2 mm, which was , so teeth would appear broader after the diastema closure. Hence Crown Lengthening procedure was planned to achieve ideal crown to width ratio (figure 4.). Probing depth of the sulcus was 2 mm, therefore osseous reduction

was done. Digital mockup (figure 6.) was done using Exocad software and a 3D model (figure 7.) was printed. Shade selection was done using Vitapan Classical shade guide and A2 shade was selected for the patient. Putty Index (Densply, Aquasil Soft putty) was prepared and intra oral transfer of mock up (Figure 8.) was done which was used as a preparation guide. Depth grooves were placed and veneer preparation was done using Guriel's Technique and chamfer margins were given.

Final impression was made using addition silicone putty (Densply, Aquasil Soft putty) using double stage and was sent to the lab (figure 9). Provisional restoration was given using self cure acrylic resin- Cool temp (Cotlene Whaledent) by spot etching. Lithium Disilicate veneers were fabricated.

Before bonding, the veneers were silanized with a silane coupling agent (Monobond Plus, Ivoclar Vivadent) and their internal surfaces were etched with 9.5% hydrofluoric acid (Ultradent, Germany) for 20 seconds. Teeth 11,12,21,22 were etched using 37% phosphoric acid (Total Etch, Ivoclar Vivadent) and the etchant was properly washed off after 15 seconds. A thin layer of bonding agent was applied to the inner surface of veneers as well as all tooth surfaces. A suitable shade of dual cure composite luting agent (Variolink-II, Ivoclar) was chosen. The surfaces of the teeth were covered with veneers using luting cement and tack cured for 5 seconds. Excess material was removed and final curing was done for 60s. Patient was recalled after a week (figure 10.).

**Discussion:** The majority of persistent diastemas were once thought to be caused by enlarged labial frena, however this is now only true in a small percentage of cases. Oral habits, muscular imbalances, physical impediments, abnormal maxillary arch structure, and different dental malformations are additional etiologies associated with diastema<sup>1</sup>. Diastemas have a negative impact on aesthetics, and the procedure suggested can be employed to closure a variety of midline diastemas without jeopardizing the aesthetics and stability of the treated outcome. Because of their unattractive appearance, all of the patients found it difficult to communicate with others and demanded quick results<sup>2</sup>. The treatment strategy for difficult midline diastema closure instances depends on the breadth to length ratio of the central incisors for aesthetic rehabilitation<sup>5</sup>. As there was enough keratinized gingiva width and to assure that the biologic width would be restored after the flap had healed, the crown lengthening was done using a flap with osteotomy method. Given that the patient's teeth were

broader mesiodistally, a crown lengthening surgery was required to attain the optimal crown height-to-width ratio<sup>8</sup>.

Diastemas have a negative impact on aesthetics, and the procedure suggested can be employed to closure a variety of midline diastemas without sacrificing the aesthetics and stability of the treated outcome. Over the course of ten years, porcelain laminate veneers are expected to last 91% of the time<sup>6</sup>. Although composite resin is simple to use, has fewer appointments, and is less expensive, it has worse surface stain resistance and wear resistance inferior to porcelain for teeth. In addition, porcelain laminate veneers have a great tissue response and a polished surface that closely resembles a real tooth, which can improve smiles rapidly, conservatively, and without any pain<sup>7</sup>.

### **Conclusion**

Concerns about malocclusion and aesthetics accompany the existence of a diastema between the central incisors in the adult patient. A precise diagnosis of the cause of the diastema and a treatment strategy appropriate to that cause, which may include medical and dental histories, radiographic and clinical examinations are necessary for its effective treatment.



Figure 1. Pre-operative smile



Figure 2. Low frenal attachment



Figure 3. Frenectomy

Figure 4. Crown lengthening procedure



Figure 5. Healing post frenectomy and crown lengthening



Figure 6. Digital mock up using Exocad



Figure 7. 3D printed model and putty index



Figure 8. Intra oral transfer of mockup



Figure 9. Veneer preparation using Guriel's technique

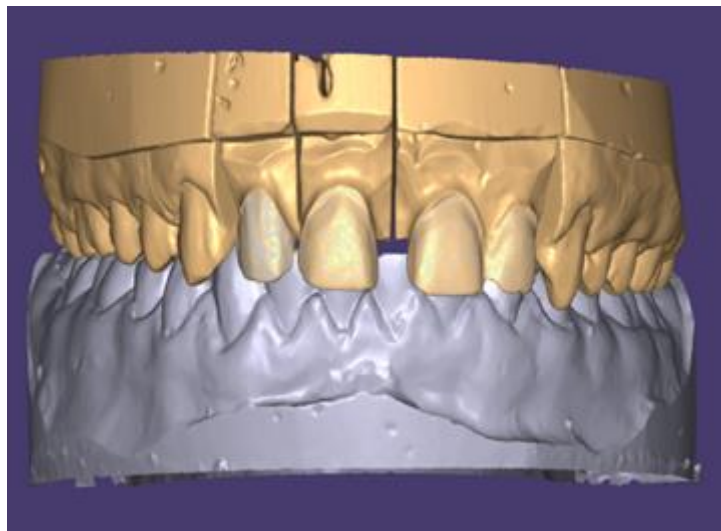


Figure 10. Scanned Model





Figure 11. Post Operative picture

### References:

- 1) Kamath M K, Arun A V. Midline diastema. *Int J Orthod Rehabil* [serial online] 2016 [cited 2022 Dec 13];7:101-4. Available from: <https://www.orthodrehab.org/text.asp?2016/7/3/101/192532>
- 2) Viswambaran M, Londhe SM, Kumar V. Conservative and esthetic management of diastema closure using porcelain laminate veneers. *Med J Armed Forces India*. 2015 Dec;71(Suppl 2):S581-5. doi: 10.1016/j.mjafi.2014.08.014. Epub 2014 Nov 6. PMID: 26843776; PMCID: PMC4705185.
- 3) Al Habdan, Al Hanouf. (2017). Three-Year Follow-Up of Diastema Closure Using Ceramic Veneers: A Case Report. *Dentistry*. 7. 440. 10.4172/2161-1122.1000440.
- 4) [https://ijshr.com/IJSHR\\_Vol.5\\_Issue.1\\_Jan2020/IJSHR0010.pdf](https://ijshr.com/IJSHR_Vol.5_Issue.1_Jan2020/IJSHR0010.pdf)
- 5) Korkut, B., Yanikoglu, F., & Tagtekin, D. (2016). Direct Midline Diastema Closure with Composite Layering Technique: A One-Year Follow-Up. *Case Reports in Dentistry*, 2016, 1–5. doi:10.1155/2016/6810984
- 6) Viswambaran, M., Londhe, S. M., & Kumar, V. (2015). Conservative and esthetic management of diastema closure using porcelain laminate veneers. *Medical Journal Armed Forces India*, 71, S581–S585. doi:10.1016/j.mjafi.2014.08.014
- 7) [https://www.thieme-connect.com/products/ejournals/pdf/10.4103/ejd.ejd\\_208\\_18.pdf](https://www.thieme-connect.com/products/ejournals/pdf/10.4103/ejd.ejd_208_18.pdf)



- 8) Saeralaathan S, Lavu V, Rajan M, Balaji S K, Ganesh A. An interdisciplinary approach to management of diastemas: A novel classification and a case report. Indian J Dent Res 2021;32:250-5