

Management of midline diastema using pressable ceramics and zirconia crowns: a case series

Sunil Rayavarapu^{1*}, Kalyan Yelisetty¹, Anil Budumuru², N V Teja Varma¹, Prem Sagar Yekula³

¹Private Practitioner, Amalapuram, Andhra Pradesh, India.

²Reader, Department of Oral and Maxillofacial Surgery, Vishnu Dental College, Bhimavaram, Andhra Pradesh, India.

³Reader, Department of Prosthodontics, Sibar Institute of Dental Sciences, Guntur, Andhra Pradesh, India.

Article History

Received 6th July 2023

Accepted 29th December 2023

Available online 31st December 2023

*Correspondence

Sunil Rayavarapu

Private Practitioner,
Amalapuram, Andhra Pradesh, India.

E-mail: sunilavengersi@gmail.com

DOI: <http://dx.doi.org/10.37983/IJDM.2023.5404>

Abstract

Maxillary and mandibular midline diastema (MMD) is frequently observed in various populations. The occurrence of MMD can be attributed to multiple factors, including etiological, developmental, and patient habits. The diverse options to treat MMD are orthodontic correction, direct and indirect restorations, crowns, and veneers. This case series presents instances of closing maxillary and mandibular midline diastema using e.max veneers and zirconia crowns.

Keywords: Midline diastema, e.max veneers, Zirconia crowns, Aesthetics.

1. Introduction

Individuals with missing teeth or gaps between teeth are easily recognized by others. This can adversely affect the physiological and social behaviour of the individual. Often individuals want their teeth to look natural and beautiful. Midline diastemas are treated to ensure satisfactory long-lasting aesthetic results [1]. A gap of 0.5 mm or more between two maxillary centrals can be defined as midline diastema [2,3].

Seaeralathan S *et al.* introduced a classification system known as Anatomic and Therapeutic classification, which is based on the restorative perio approach [3]. Treatment options for diastema include both restorative and orthodontic approaches [4,5]. This series of cases outline the process of closing midline diastema using e.max veneers and zirconia crowns.

2. Case 1

A 50-year-old male reported to our clinic with maxillary midline diastema between the two central incisors (Figure 1). Clinical examination revealed a 3mm gap between the two central incisors (Figure 2) and class 1 dental relationship. Intraoral photographs were taken along with shade tabs to determine the shade of the tooth (Figure 3). The patient was given multiple options for closing the diastema, including orthodontic and restorative procedures. Due to the prolonged time for the orthodontic procedure, the patient chose to restore the teeth with e.max (pressable) veneers.

A putty index was made before tooth preparation to check the labial reduction. Tooth preparation was performed at an enamel depth of 0.5-1 mm on the buccal side and 1.5 mm on the incisal side using a depth-cutting tapered diamond bur [4] (Figure 4). The chamfer finish line was given at the

cervical region. Proximal reduction was performed beyond the contact point on the mesial surface to avoid black triangles.

2.1 Chair-side impression

Impression was made using A-silicone (Photosil putty and light body, DPI, Mumbai) impression material. A two-step technique was followed during the impression procedure. Putty impression was made initially and allowed to set as per manufacturer's instructions. Space was created in the impression and a light body was injected onto the tooth surface and also into the impression tray and seated in the patient's mouth. It was removed after the complete setting of the light body. Impressions were sent to the lab, and veneers were received after one week. Cementation of the veneers was done using self-cure resin cement (RelyX U100, 3M, ESPE), and margins were cured with UV light (Figure 5). Excess cement was removed using an explorer.

3. Case 2

A male patient reported to our clinic with the chief complaint of the gap between his upper and lower teeth (Figure 6). Upon intra-oral examination, diastemas were present between central, lateral and canines in both upper and lower teeth. Radiographic and intraoral examination revealed a prognathic mandible. The patient underwent orthodontic treatment but discontinued the treatment. The patient was given different treatment options, but the patient chose complete coverage crowns for both upper and lower anterior teeth.

Tooth preparations were done for teeth 13 to 23 and 33 to 43 (Figure 7). Root canals were done for teeth 11,12, 21 and 22. Putty impressions were made with A- silicone (Photosil putty and light body, DPI, Mumbai) impression material.

Bite registration was made using jet bite registration paste (Coltene, Whaldent, Switzerland). Temporary crowns were made for a trail look and cemented with Freeugenol cement (GC Corporation, Tokyo, Japan). Final impressions were sent to the lab for fabrication of zirconia crowns after the trail

was checked (Figure 8). Cementation of zirconia crowns was done using self-cure resin cement (RelyX U100, 3M, ESPE), and excess cement was removed using an explorer (Figure 9).



Figures 1 - 5. 1. Pre-operative photograph, 2. 3mm diastema, 3. Shade selection, 4. Tooth preparation, and 5. Post-operative photograph.



Figures 6-9. 6. Pre-operative photograph, 7. Tooth preparations, 8. Bisque trail, and 9. Post-operative photograph.

4. Case 3

A 45-year-old female patient was reported to our clinic with diastema in the upper and lower teeth. Intraoral examination revealed mild diastema of 1 mm in the maxillary anterior teeth and 2 mm diastema between the lower central incisors (Figure 10). The patient chose to have

zirconia veneers for the upper anterior teeth i.e., from 13 to 23 and zirconia crowns for lower anterior teeth i.e., from 41 to 32. Tooth preparations were done to receive veneers for 13 to 23 and full coverage crowns from 41 to 32. Putty impressions were made using A-silicone (Photosil putty and light body, DPI, Mumbai) impression material. Impressions

were sent to the lab, and the prosthesis was received after one week. Cementation of veneers and crowns was done using self-adhesive resin cement (RelyX U100, 3M, ESPE) (Figure 11).

5. Discussion

Anterior diastema is defined as anterior midline spacing greater than 0.5mm between the proximal surfaces of the adjacent teeth. Composite restorations are most often used as the first line of treatment due to their minimally invasive technique and low cost. But major disadvantages are low strength and more susceptibility to staining resulting in an unaesthetic appearance.

The preferred method for achieving aesthetic restorations is through full coverage restorations. The landscape of ceramic restorations underwent a significant transformation in the early 2000s with the introduction of CAD/CAM techniques and the transformation toughened zirconia. Initial all-ceramic restorations were aesthetically pleasing but prone to brittleness, limiting their use to anterior restorations. The advent of zirconia addressed both aesthetic and strength requirements. As technology

progressed, minimally invasive procedures gained popularity. Rectifying midline diastema presents a challenging task. Among the available options, orthodontic treatment is the most conservative approach. However, due to drawbacks such as prolonged treatment duration and financial considerations, many patients opt for full-coverage crowns or veneers as their primary choice of treatment [6,7].

Gresnigt *et al.* [8] documented a case involving partial veneers crafted from pressable ceramics. In this case series, a comparable method was employed in the veneer fabrication process. Pressable ceramics offer several advantages, including safety, high aesthetics, reduced working time, a secure fit, long-term success, and broad applicability [4]. The projected survival rate of veneers over a 10-year period is reported to be 91% [9,10]. This series of cases highlights the significance of careful planning, appropriate material selection, and effective communication with the laboratory technician in achieving a balanced smile and complete satisfaction for both the patient and the dentist [4].



Figure 10. Pre-operative photograph, and Figure 11. Post-operative photograph.

6. Conclusion

This series of cases demonstrated that zirconia and glass ceramic veneers and crowns are viable options for closing diastemas. Consequently, they are recognized as primary considerations in the treatment planning for midline diastemas.

Conflicts of interest: Authors declared no conflicts of interest.

Financial support: None

References

- Şen N, İşler S. Multidisciplinary management of a severe maxillary midline diastema: a clinical report. *J Prosthodont.* 2019;28(3):239-43. <https://doi.org/10.1111/jopr.12979>
- Nadgouda M, Patel A, Nikhade P, Chandak M, Gupta R, Nikhade PP. Bridging Gaps: A Comparative Approach to Managing Midline Diastema. *Cureus.* 2022 Aug 24;14(8):e28355. <https://doi.org/10.7759/cureus.28355>
- Saeralathan S, Lavu V, Rajan M, Balaji SK, Ganesh A. An interdisciplinary approach to management of diastemas: A novel classification and a case report. *Indian J Dent Res* 2021;32(2):250-5. https://doi.org/10.4103/ijdr.IJDR_952_20
- Geeta IB, Sadiya Naaz A, Sreejith S, Apoorva Saxsena. Esthetic management of diastema closure using porcelain laminate veneers and all ceramic crowns. *Int J Curr Res.* 2018;10(3):66584-66587.
- Jaber A. Esthetic management of diastema closure using metal ceramic crowns: A case report. *Oral Health Care.* 2018;3(2):1-3. <https://doi.org/10.15761/OHC.1000144>
- Gupta R, Miglani A, Gandhi A, Kapoor N. Esthetic Management of Diastema Closure: An Innovative Technique Utilizing Putty Index Method. *Int J Oral Care Res* 2018;6(1):S104-108.
- Akan E, Bagis B. Midline diastema closure with partial laminate veneers: A case report. *Balk J Dent Med.* 2016;20(1):59-62. <https://doi.org/10.1515/bjdm-2016-0010>
- Gresnigt M, Ozcan M. Esthetic rehabilitation of anterior teeth with porcelain laminates and sectional veneers. *J Can Dent Assoc.* 2011; 77:b143.
- Dumfahrt H, Schaffer H. Porcelain laminate veneers. A retrospective evaluation after 1 to 10 years of service: part II clinical results. *Int J Prosthodont.* 2000;13(1):9-18.
- Frese C, Staehle HJ, Wolff D. The assessment of dentofacial esthetics in restorative dentistry: a review of the literature. *J Am Dent Assoc.* 2012;143(5):461-466. <https://doi.org/10.14219/jada.archive.2012.0205>

How to cite this article: Rayavarapu S, Yelisetty K, Budumuru A, Varma N V T, Yekula P S. Management of midline diastema using pressable ceramics and zirconia crowns: a case series. *Int J Dent Mater.* 2023;5(4):111-113. DOI:<http://dx.doi.org/10.37983/IJDM.2023.5404>