

Aesthetic Management Of Midline Diastema Closure With Direct Composite Restoration- A Case Report

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ABSTRACT

Maxillary anterior spacing is a common aesthetic concern among patients. Labial frenulum, microdontia, mesiodens, peg-shaped lateral incisors, agenesis, cysts, and habits such as finger sucking, tongue thrusting, or lip sucking, dental malformations, genetics, proclinations, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum all contribute to midline diastema. Appropriate technique and material for effective treatment are determined by time, physical, psychological, and financial constraints. In diastema cases, direct composite resins provide the dentist and patient complete control over these limitations and the development of a confident smile. In this case report a midline diastema in the maxillary arch was aesthetically managed with direct composite resin in two appointments.

Keywords: Spacing, Composite, aesthetic, Midline diastema

INTRODUCTION

Patients frequently express aesthetic concerns about maxillary midline diastema.^[1] Midline diastema was defined by Keene as anterior midline gap more than 0.5 mm between the proximal surfaces of adjacent teeth.^[2] The maxilla has a higher prevalence of midline diastema than the mandible.^[3] The width to length ratio of the central incisors determines the treatment plan in difficult midline diastema closure cases. The level of distal proximal reduction, the number of teeth to be treated, the placement and location of prominences and concavities to produce the illusion, and whether to utilise full-veneers or merely add to the interproximal are all influenced by that ratio.^[4] The right technique and material for a patient are also determined by time, physical, psychological, and financial constraints.^[5] Improved materials and methods are commonly encountered, enabling professionals to endless improvement while meeting the aesthetic demands of their patients.

Recent aesthetic composite resin materials have physical and mechanical properties similar to natural teeth, as well as an appearance identical to natural dentin and enamel.^[6,7]

Case Report

A 30-year-old male patient reported to the department of operative dentistry with a chief complaint of broken upper front tooth along with spacing. Intraoral examination revealed Ellis and Davey class 2 fracture in #11 and spacing between #11 and #21 (~2mm). As a conservative and aesthetic management, direct composite restoration was indicated in 2 appointments. Pre-operative photographs were taken [Figure 1A]. A study model was fabricated to determine the length of the spacing and a wax mock-up was done in the study model. [Figure 1B]. Then, a putty index was fabricated which was used as a guide during the procedure. [Figure 1C]. In the next visit the teeth were isolated with rubber dam, the shade was selected which was A2 for #11 and A1 for #21 respectively. Acid etching with 37% phosphoric acid was carried out followed by application of bonding agent. A palatal shell was constructed using putty Index. [Figure 1D]. The diastema closure was performed with direct composite resin by layering technique. [Figure 1E]. Finishing and polishing was carried out with composite polishing discs and post-operative photographs were taken. [Figure 1F].

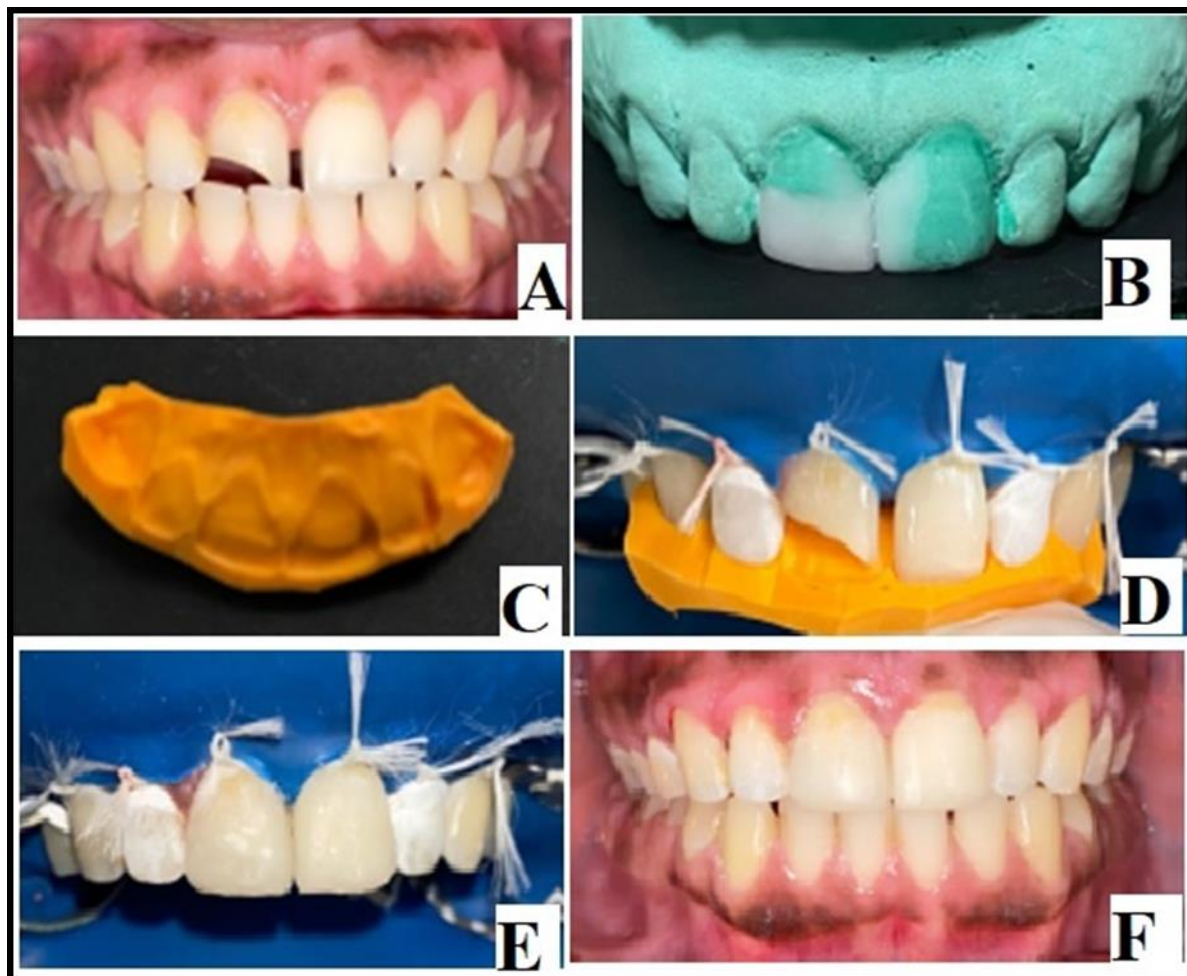


Figure1-A) Pre-operative photograph, B) Wax mock up done in study model, C) Putty index fabricated, D) Putty index used as a guide for the procedure, E) Diastema closure done, F) Finishing and polishing done.

DISCUSSION

Diastema closure with direct resin is a recommended method that is commonly performed in clinic. However, in circumstances when there is a large gap between the teeth, the basic closure may not provide the patient with a natural and pleasant solution. Before the treatment, the patient must be informed that the stability of a composite closure may not be as long-lasting as that of a veneer or crown, so adequate care must be followed, and the patient's concern is required. ^[8,9]

In terms of aesthetic dentistry, composite restorations provide various benefits that other treatment choices, including ceramic veneers and orthodontic treatment, do not. They are kinder on the opposing dentition than ceramic materials, ^[10] and if a fracture occurs, they may be quickly fixed as compared to costly and time-consuming repairs or remakes for porcelain alternatives. ^[11]

Most composite materials have low fractural toughness, shear strength, and compressive strength, making them unsuitable for ultra-high-stress areas observed in particular clinical scenarios. ^[12]

Additionally, direct composite resin restorations may not have the same colour stability as glazed ceramics; however, this is dependent on the quality of finishing and polishing procedures and can be avoided with recalls. ^[13]

Despite the fact that direct composite resin restorations have these drawbacks, developing adhesive techniques and higher quality resin materials enable dentists to build more conservative, functional, aesthetic, economical, and long-lasting restorations in a relatively short chair time. ^[14,15]

CONCLUSION

- Midline diastema has a complex aetiology.
- Management relies heavily on accurate diagnosis and timing.
- A good retention is the key to success in a midline diastema closure.

REFERENCES

1. Koora K, Muthu MS, Rathna PV. Spontaneous closure of midline diastema following frenectomy. J Indian Soc Pedod Prev Dent. 2007 Jan 1;25(1):23-6.
2. Keene HJ. Distribution of diastemas in the dentition of man. Am J Phys Anthropol. 1963; 21:

437-41.

3. Kaimenyi JT. Occurrence of midline diastema and frenum attachments amongst school children in Nairobi, Kenya. *Indian J Dent Res.* 1998 Apr-Jun;9(2):67-71.
4. Maluly-Proni AT, Oliveira-Reis B, Assunção WG, Santos PHD. Minimum intervention management of diastema closure using cordless displacement system and laminate veneers: A 2-year follow-up. *Eur J Dent.* 2018 Jul-Sep;12(3):446-49.
5. Prabhu R, Bhaskaran S, Geetha Prabhu KR, Eswaran MA, Phanikrishna G, Deepthi B. Clinical evaluation of direct composite restoration done for midline diastema closure - long-term study. *J Pharm Bioallied Sci.* 2015 Aug;7(Suppl 2):S559-62.
6. Lee YK, Lim BS, Kim CW. Effect of surface conditions on the color of dental resin composites. *J Biomed Mater Res.* 2002;63(5):657-63.
7. Khashayar G, Dozic A, Kleverlaan CJ, Feilzer AJ, Roeters J. The influence of varying layer thicknesses on the color predictability of two different composite layering concepts. *Dent Mater.* 2014 May;30(5):493-8.
8. Sangavi T, Subbiya A, Geethapriya N, Prakash V. Management of Midline Diastema by Direct Composite Resin Using Putty Index: A Case Report. *Indian J Public Health Res Dev.* 2019 Nov 1;10(11):2810-13.
9. Bharadwaj B, Geethapriya N, Vivekanandhan P, Subbiya A. Diastema Closure using Porcelain Veneers: A Case Report. *Indian J Public Health Res Dev.* 2019 Nov 1;10(11):2814-17.
10. Magne P, Belser UC. Porcelain versus composite inlays/onlays: effects of mechanical loads on stress distribution, adhesion, and crown flexure. *Int J Periodontics Restorative Dent.* 2003 Dec;23(6):543-55.
11. Berksun S, Kedici PS, Saglam S. Repair of fractured porcelain restorations with composite bonded porcelain laminate contours. *J Prosthet Dent.* 1993 May;69(5):457-8.
12. Stappert CF, Ozden U, Gerds T, Strub JR. Longevity and failure load of ceramic veneers with different preparation designs after exposure to masticatory simulation. *J Prosthet Dent.* 2005 Aug;94(2):132-9.
13. Demirci M, Tuncer S, Öztaş E, Tekçe N, Uysal Ö. A 4-year clinical evaluation of direct composite build-ups for space closure after orthodontic treatment. *Clin Oral Investig.* 2015 Dec;19(9):2187-99.
14. Azzaldeen A, Muhamad AH. Diastema closure with direct composite: architectural gingival contouring. *Journal of Advanced Medical and Dental Sciences Research.* 2015 Jan;3(1):134-9.
15. Korkut B, Yanikoglu F, Tagtekin D. Direct midline diastema closure with composite layering technique: a one-year follow-up. *Case reports in dentistry.* 2016 Jan 6;2016.