

Diastema closure and esthetic rehabilitation with peg-shaped laterals: A case series

ABSTRACT

Esthetic rehabilitation utilizes advanced materials and technology to address the needs of patients with significant esthetic concerns, adhering to a conservative approach through the application of direct composites. This methodology is designed to ensure minimal discomfort and maximum safety during treatment. Direct composite veneers represent a conservative strategy for the correction of esthetic profiles. This case report details the esthetic enhancement of a midline diastema accompanied by peg-shaped lateral incisors, with a follow-up period of 6 months. In summary, for patients expressing concern regarding the esthetic appearance of their anterior teeth, direct composite veneers present a viable and effective treatment option.

Keywords: Diastema, direct composite, esthetic, peg-shape lateral, veneers

Key Messages

- Select appropriate cases for direct composite veneers to ensure optimal results.
- Follow step-by-step guidelines to establish gingival zenith and enhance the appearance of the anterior teeth.
- Provide clear advice to the patient to maximize the chances of long-term success.

INTRODUCTION

The significance of an attractive smile, coupled with the increasing demand for tooth color restoration, has fundamentally altered the landscape of esthetic and functional dentistry. A compelling smile is critical as it leaves a lasting impression on all individuals encountered. The objectives of esthetic rehabilitation in dentistry are to achieve the highest level of improvement, while minimizing the loss of healthy tooth structure. Additionally, it is essential to ensure that the alignment of the teeth is harmonious with the patient's gums, facial features, and lips.^[1] The presence of a diastema, or gap between anterior teeth, is frequently regarded as a considerable esthetic challenge and can be closed using full or sectional fixed appliances, clear aligners etc. Various treatment modalities like laminates, direct composite veneers, porcelain veneers, and ceramic crowns are available for the closure of diastemas; however, it is important to note that not all diastemas can be managed using the same technique or in the same

timeline. The concept and treatment protocol associated with direct composites offers a straightforward, patient-centered, comprehensive, and minimally invasive approach, prioritizing the psychological well-being, functional needs, and esthetic aspirations of the patient. Maxillary anterior teeth malformations such as peg-shaped laterals midline diastema can create aesthetic problems.^[2,3] The combination of midline diastema and peg-shaped lateral incisors can lead

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to a unique dental condition. Peg-shaped laterals, which are characterized by their undersized and tapered appearance, are often observed bilaterally and may be associated with other dental anomalies. Typically, these peg-shaped lateral incisors contribute to the development of a midline diastema, which may result from the distal movement of the central incisors and potential canine impaction. While this combination can affect the aesthetics of one's smile, successful restorative treatments are contingent upon a comprehensive understanding of patient expectations as well as the proficiency of the practitioner involved.^[4,5] Direct veneers^[6] offer an affordable option with minimal tooth preparation. These two case reports describe a direct aesthetic correction of midline diastema closure and peg-shaped lateral restoration.

CASE REPORT

Case 1

A 24-year-old female patient reported to the Department of Conservative Dentistry and Endodontics at King George Medical College, Lucknow, with the chief complaint of small teeth in the upper front region and spacing between two upper front teeth. The patient's medical history is not significant. Intraoral examination revealed the presence of midline spacing using a vernier caliper between maxillary central incisors (~2.5 mm) and peg-shaped lateral incisors with short clinical crowns and thick fibrous tissue between

the central incisors [Figure 1a and b]. No dental caries were observed in both clinical and radiographical examinations. The patient had good periodontal health and a stable intercuspal position, normal vertical and horizontal overlap, and canine-protected guidance. The treatment plan was made keeping in view that the patient would not be able to afford expensive treatment and was also not willing to come in for multiple visits. The financial circumstances, patient's age, and requirements of quick results by the patient, along with the available treatment options, precluded two potential interventions: comprehensive orthodontics and porcelain veneers. Consequently, a treatment plan was developed to enhance the patient's smile through the application of direct composite veneers, effectively addressing the misalignment of the teeth.

The treatment protocol was designed to include the excision of extensive fibrous tissue, followed by gingival contouring, and subsequently the application of direct composite veneers. Before the procedure, written informed consent was secured from the patient. The initial step involved the removal of the thick fibrous tissue utilizing a diode soft tissue laser, operating at a power setting of 1.5 W, after the administration of lidocaine 2% with epinephrine 1/100,000 by the infiltration technique [Figure 1c]. The patient was recalled after 1 week after healing the gingival [Figure 1d]. On the next visit, first, shade selection was done, and an A1 shade of Vita guide was selected for the teeth to be restored. Minimal preparation was done with diamond bur (#2135F; KGSorensen Indústria e Comércio Ltda, Barueri, SP, Brazil). Isolation of the operating area was achieved with cotton rolls as the patient was experiencing gagging with the rubber dam. The preparation was etched – with 37% phosphoric acid for 30 s, rinsed with water, and air-dried. The adjacent tooth was isolated using Teflon tape [Figure 1e]. A single layer of bonding agent (Prime & Bond® NT™, Dentsply Caulk) was applied and cured for 20 s with an LED composite curing unit. A thin layer of the nano-hybrid composite (Tetric N Ceram, Ivoclar Vivadent) was then incrementally applied to the tooth surface and light-cured for 40 s. Following this, the tooth was shaped, finished, and polished using a Super Snap mini kit (Shofu) [Figure 1f]. After completing the procedure, oral hygiene instructions were provided to the patient. The patient was scheduled for follow-up appointments at 1 week, 1 month, and 6 months post-procedure.

Case 2

A 26-year-old female patient presented with a primary concern regarding a smaller tooth located in the upper anterior region, as well as the presence of spacing between two upper anterior teeth. The patient reported no significant family or medical history. Intraoral examination revealed peg-shaped upper right permanent lateral incisors. Midline



Figure 1: (a and b) Peg shape lateral incisors with short shape crown. (c and d) Showing thick fibrous tissue removed and follow up. (e and f) Isolation adjacent tooth and Post-procedure

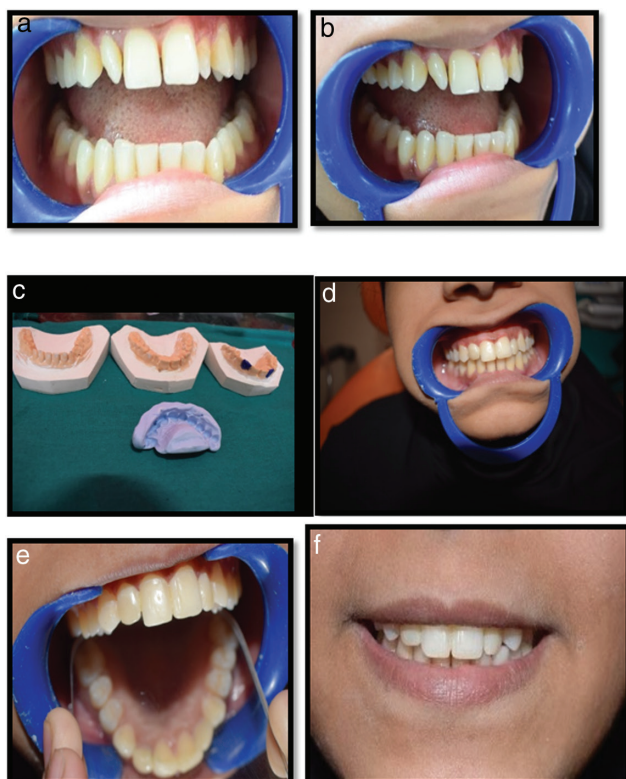


Figure 2: (a and b) Midline diastema. (c and d) Fabrication of palatal silicone putty and restoration with direct composite veneers. (e and f) Post treatment follow up 1 month and 6 month

diastema was present between both the central incisors of 1 mm [Figure 2a and b]. The patient had good periodontal health. A radiographic examination indicated the presence of a peg-shaped lateral incisor with a normal root length. Prior to initiating the procedure, a palatal silicone putty index (DMG America) was fabricated [refer to Figure 2c]. This index served as a guiding tool for the application of the initial palatal composite layer. The restoration of the peg-shaped lateral incisor and the midline diastema was accomplished using direct resin composite veneers, following the procedure outlined in Case I [see Figure 2d]. Comprehensive oral hygiene instructions were provided, and the patient was scheduled for follow-up appointments at 1 week, 1 month, and 6 months post-treatment [Figure 2e and f].

DISCUSSION

Establishing a patient's natural dental aesthetics is a critical aspect of contemporary dentistry, alongside considerations of function and phonation. Abnormalities in the color, shape, and positioning of anterior teeth can lead to significant esthetic challenges for patients. In Case 1, a thick fibrous tissue was identified between the central incisor and the permanent right lateral incisor, while the left lateral incisor presented as peg-shaped. Consequently, an intervention was undertaken to excise the fibrous tissue and close the

midline space, adhering to the principles of the golden proportion. Additionally, the right maxillary canine was shaped to resemble that of the lateral incisor. This approach in Case 1 demonstrated various advantages, including being noninvasive, esthetic, efficient, and provides prompt results and minimal patient compliance requirements.^[3,7,8]

Direct composite veneers are a more conservative option to porcelain because with the use of microhybrid and nano-hybrid composites, the finishing and polishing of these restorations look like porcelain veneers. The success rate of direct composite and durability of these materials depends on patient habits like smoking or drinking dark-colored liquids, which alter the color of the teeth.^[3] Direct composites do not have nature of brittleness and abrasive wear as compared to porcelain crowns.^[9,10] The presence of a midline diastema or spaces in between anterior teeth can be a major esthetic concern for patients. There are various treatment options available for diastema closure like orthodontic movement and prosthodontic treatment. Among these, the use of direct resin restorations seems to be a conservative, cost-effective, and more practical option.^[11]

Direct composite veneers are a more conservative option compared to porcelain veneers. With the use of microhybrid and nano-hybrid composites, the finishing and polishing of these restorations can closely resemble that of porcelain veneers. The success rate and durability of direct composites depend significantly on patient habits, such as smoking or consuming dark-colored beverages, which can alter the color of the teeth.^[3] Unlike porcelain crowns, direct composites are less brittle and experience less abrasive wear.^[9,10] Patients often find the presence of a midline diastema or spaces between their anterior teeth to be a significant esthetic concern. There are several treatment options available for diastema closure, including orthodontic movement and prosthodontic treatments. Among these, direct resin restorations are considered more conservative, cost-effective, and practical.^[11]

In this case report, the patient's expectations were not only met but exceeded through the use of conservative direct composite restorations, demonstrating the efficacy and precision of this approach in enhancing patient satisfaction.

CONCLUSION

Composite resin restorations for midline diastemas and peg-shaped laterals demonstrate commendable clinical acceptance and retention when all established protocols are meticulously adhered to, employing the appropriate clinical techniques. This aspect of esthetic dentistry represents one of the rare opportunities for patients to effectively assess the quality of the work performed.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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