

Rehabilitation of Anterior Region Tooth Size Discrepancies After Orthodontic Treatment: A Case Series

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Abstract

Multidisciplinary approaches are used to treat aesthetic and functional problems related to teeth. Following orthodontic treatment, patients may require restorative dental treatment for aesthetic adjustments. Especially in maxillary anterior region, direct composite resin restorations which are one of the restorative treatment options following orthodontic treatment are frequently preferred today due to their minimal invasive and conservative nature. In this case report, it was aimed to eliminate the aesthetic problems observed due to tooth size discrepancies in the anterior region of the maxillary arch with direct composite resin restorations after orthodontic treatment. The patients whose orthodontic treatments were about to be completed at Erciyes University Department of Orthodontics were referred to the Department of Restorative Dentistry for consultation regarding their aesthetic complaints in anterior maxillary region before debonding. As a result of intraoral examinations of three patients, tooth size discrepancies and consequently polydiastema were observed. Following the evaluation, it was decided to apply direct aesthetic composite resin restorations to the cases. Tooth size discrepancies and diastemas observed after orthodontic treatment were rehabilitated using direct composite restorations. Minimally invasive rehabilitation of aesthetic problems after orthodontic treatment is possible with direct composite resins.

Case Report (HRU Int J Dent Oral Res 2025; 5(1): 36-39)

Keywords: Aesthetic, direct composite restoration, minimally invasive, polydiastema, tooth size discrepancy.

Introduction

Aesthetic and functional problems observed in teeth hold great importance for patients. There are various treatment options for solving these problems. Aesthetic problems are generally treated with multidisciplinary approaches (1). Orthodontic treatment is commonly employed for problems such as tooth size discrepancies, diastema, dental anomalies, crowding, malocclusion. In some cases, in addition to this treatment, restorative procedures are also required in the anterior region to achieve optimal aesthetic outcomes (2). To avoid aesthetic complaints especially in the anterior region at the end of the procedure, the treatment should be completed with a multidisciplinary approach.

Direct composite resin restorations, one of the restorative treatment options, are highly preferred today because they offer minimally invasive and more conservative approaches (3). These restorations have

advantages such as ease of application, repairability, low cost and being completed in a single appointment (4).

The purpose of this case report is to eliminate aesthetic problems caused by tooth size discrepancies in the anterior region of the maxillary arch using direct composite resin restorations as a minimally invasive approach after orthodontic treatment.

Presentation of the Cases

Patients whose orthodontic treatments were about to be completed at Erciyes University, Department of Orthodontics, were referred to the Department of Restorative Dentistry for consultation regarding aesthetic complaints in the anterior maxillary region before debonding. Then, before starting the treatment, the patients were informed verbally and in writing that the information and photographs related to the case could be

used for publication purposes, and an informed consent form was obtained from the patients.

Case 1: As a result of the intraoral examination performed on a 20-year-old female patient without any systemic disease, it was determined that the patient had tooth size discrepancies, polydiastema and peg-shaped lateral incisors. Based on the evaluation, direct aesthetic composite resin restorations were planned. Following shade selection with the button technique, the teeth were isolated with a rubber dam, polished using a fluoride-free prophylaxis paste, and etched with 37% phosphoric etching gel for 30 seconds. After rinse and drying, a two-step etch-and-rinse adhesive (Adper Single Bond 2, 3M ESPE, St. Paul, MN, USA) was applied according to the manufacturer's instructions. The teeth were restored using nanofilled composite resin [Filtek Ultimate, A2 Body and Enamel, 3M ESPE, St. Paul, MN, USA]. Finishing and polishing were used with yellow-banded diamond burs, abrasive discs (Sof-Lex, 3M ESPE, St. Paul, MN, USA), and spiral polishing discs (Clearfil Twist Dia, Kuraray, Tokyo, Japan). Procedures and protocols for this case are shown in Figure 1. Post-debonding (before restorative treatment) and after restorative treatment photographs are presented in Figure 2.



Figure 1. Case 1: Procedures and steps: etching, bonding, modelling, finishing, polishing & glossing.



Figure 2. Post-orthodontic treatment and post-restorative treatment: initial and final photographs of case 1.

Case 2: Following the examination of a 19-year-old female patient with no systemic disease after orthodontic treatment, midline diastema and peg-shaped lateral incisor teeth were detected. Direct aesthetic composite resin restorations were planned after examination. Following shade selection using the button technique, the teeth were isolated with a rubber dam, polished with fluoride-free prophylaxis paste, and etched with 37% phosphoric etching gel for 30 seconds. The teeth were then rehabilitated and restored using the materials and methods in Case 1. Pre- and post-restorative treatment photographs are shown in Figure 3.

Case 3: As a result of the intraoral examination performed on a 20-year-old male patient whose orthodontic treatment was about to be completed, tooth size discrepancies and consequently polydiastema were observed. Direct aesthetic composite resin restorations were planned for this case. Following shade selection, the teeth were isolated with a rubber dam, polished using fluoride-free prophylaxis paste, and etched with 37% phosphoric etching gel for 30 seconds. The teeth were then rehabilitated and restored using the materials and methods in Case 1. Initial and final photographs of case are shown in Figure 4.



Figure 3. Post-orthodontic treatment and post-restorative treatment: initial and final photographs of case 2.



Figure 4. Post-orthodontic treatment and post-restorative treatment: initial and final photographs of case 3.

Discussion

Tooth size discrepancies and unequal spaces between the anterior teeth of the upper and lower jaws pose significant aesthetic concerns for patients (5). Aesthetic treatment options for size discrepancies include orthodontic, restorative and prosthetic treatments. Orthodontic treatments are more complex, time-consuming and costly and require fixed appliances. Restorative dentistry offers simple, fast, predictable and low-cost solutions. On the other hand prosthetic treatments involve more invasive procedures (6).

When treatment methods are examined, direct composite resin restorations stand out as a non-invasive approach that preserves aesthetic and functional changes, presenting a low risk in terms of periodontal health (6,7). Resin-based composites are preferred for achieving maximum bonding strength, aesthetic, and functional improvement with minimal loss of enamel or dentin surface (8).

The use of composite resins has increased due to their better aesthetic properties and the need to remove less sound tissue compared to former restorative materials and they may be considered clinically long-lasting. (9).

This case report evaluates composite resins applied due to aesthetic concerns in the anterior region, focusing on color matching, anatomical structure, discoloration and marginal adaptation. Aesthetic concerns and functional requirements were successfully eliminated with composite resins, and the results obtained after the 12-week clinical follow-up were found to be of ideal quality. The findings from this case report suggest that direct composite resin restorations can offer an alternative treatment option for patients with aesthetic complaints after orthodontic treatment.

Conclusion

Direct aesthetic composite resin restorations were found to be successful in restoring tooth size discrepancies in the anterior region. The anatomical restoration of the tooth is performed by selecting the appropriate shade. Thus, complementary treatment can be completed with a minimally invasive aesthetic and functional approach for patients who have completed orthodontic treatment. It was observed that ideal results could be achieved with short-term clinical treatment procedures.

Acknowledgments: This study was presented as an oral presentation at the Gaziantep University 1st International Dentistry Congress held in Gaziantep/Turkey between 25-27 October 2024.

Author contributions: EBG and VK. selected the cases. EBG completed the cases with the guidance of VK. All authors discussed the results and contributed to the final manuscript and led the writing.

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical approval: Before starting the treatment, the patients were informed verbally and in writing that the information and photographs related to the case could be used for publication purposes, and an informed consent form was obtained from the patients.

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