

RESTORATION OF PRIMARY TEETH WITH THE IPS e.max IN THE ABSENCE OF CONGENITAL MANDIBULAR CENTRAL TEETH: A 3-YEAR CASE REPORT

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ABSTRACT

Hypodontia is defined as the congenital absence of one or more permanent teeth. Various treatment options for those cases are defined such as extraction of primary tooth and restoration of edentulous area with fixed or implant supported dental prosthesis, and orthodontic treatment. A 26-year-old female patient complained of nonesthetic appearance caused by congenital absence of permanent mandibular central incisor teeth was consulted for dental treatment. Existing mandibular primary central incisor teeth were restored using two units lithium disilicate fixed partial denture without extractions.

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KONJENİTAL ALT SANTRAL DIŞ EKSİKLİĞİNDE SÜT DIŞININ IPS e.max İLE RESTORASYONU: 3 YILLIK VAKA RAPORU

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ÖZ

Hipodonti, bir yada daha fazla daimi dişin konjenital eksikliği olarak tarif edilir. Bu vakalar için değişik tedavi seçenekleri tanımlanmıştır; süt dişinin çekimi ve dişsiz sahanın sabit ya da implant destekli diş protezi ile restorasyonu ve ortodontik tedavi. Konjenital daimi mandibular santral kesici dişlerinin eksikliğinden dolayı estetik olmayan görüntüsünden şikâyetçi olan 26 yaşında bir bayan hasta, diş tedavisi için başvurmuştur. Mevcut olan mandibular süt santral dişleri, diş çekimi yapılmadan iki üyeli lityum disilikat esaslı sabit bölümlü protez kullanılarak restore edilmiştir.

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INTRODUCTION

Hypodontia is defined as the congenital absence of one or more permanent teeth. Causal factors may include genetic and environmental factors.¹ Hypodontia has been observed in 3.5–9.6% of the population.² Especially the permanent third molar, mandibular second premolar, maxillary lateral incisor, maxillary second premolar, or mandibular central incisor may be absent.³

Various treatment options are available. For example, if a primary tooth is extracted, the area can be restored with a dental implant, with maintenance of the remaining primary teeth until they are lost by exfoliation.⁴ Alternatively, retained primary teeth may be removed and a prosthesis used to restore function and esthetics. Furthermore, when a primary tooth is removed, the space may be closed with orthodontic movement.⁵

New-generation treatment options include all-ceramic fixed dental prosthesis (FDP) systems, involving extraction of the primary tooth, placement of the ceramic FDP, and full crown coverage and/or restoration.⁶ This treatment option for replacing missing teeth provides patients with functional and esthetic restoration.⁷ Because of the reflection of metal frameworks, metal-ceramic restorations show a lack of light exchange with the surrounding soft tissues. Thus, metal-ceramic restorations frequently have a compromised esthetic image compared to natural teeth.⁸

Ceramic restorations improve light transmission and diffusion to the tooth tissue. Thus, with ceramic restorations, better esthetic results can be achieved. In addition, ceramic restorations provide better biocompatibility. Recently, ceramic restorations have become increasingly popular as an alternative to metal-ceramic restorations.⁹

In this clinical report, we describe improving the esthetic image of existing primary teeth using lithium disilicate restorations (IPS e.max) without extractions in a case of hypodontia.

CASE REPORT

A 26-year-old female patient who had hypodontia in the primary teeth in the mandibular anterior region was admitted to Abant İzzet Baysal University, Faculty of Dentistry, due to poor esthetic image (Figure 1). The tooth was not mobile and a radiograph revealed no permanent successor (Figure 2). The periodontal tissue was apparently healthy and normal. Lateral and vertical percussion testing were normal.



Figure 1. Pretreatment frontal view.



Figure 2. Pretreatment panoramic view.

After an intraoral examination, treatment options were explained to the patient. The IPS e.max (Ivoclar Vivadent, Canada) was selected for the reconstruction and restoration of primary teeth. The patient consented to the treatment plan.

Before starting the teeth preparation (mandibular left and right primary central incisor teeth), the restoration color was selected based on the adjacent permanent teeth in sun light. Color selection was assisted using a Vita 3D Master (VITA Zahnfabrik, H. Rauter GmbH & Co. KG, Bad Säckingen). Each tooth was prepared according to the ceramic restoration protocol. Because the dimensions of the primary teeth were very small compared to the permanent teeth, preparation was minimal. The finished line of the preparation was made with a chamfer (0.5 mm; Figure 3).

A retraction cord was used. After the retraction cord was removed, an impression of the prepared teeth was made an impression using Elite HD+ addition silicone (Zhermack SpA, Italy) with the double stage impression technique. For esthetic appearance and function, interim prostheses were



Figure 3. Tooth preparation for all-ceramic FPD.



Figure 4a. Frontal view of definitive prosthesis.

prepared during the same treatment and were placed on the teeth temporarily.

A working cast with a removable die of the prepared teeth was fabricated in the laboratory. An IPS e.max lithium disilicate fixed dental prosthesis (FDP) was also made in the laboratory using the heat-press technique. Before the patient was called to the clinic, the FDP on the working cast was inspected for color, shape, proximal contact, and finished line.

The FDP was seated on the teeth (mandibular left and right primary central incisor tooth) gently, and color matching, crown morphology, and occlusion contact were controlled during mandibular excursion movement. After the IPS Ceramics Acid Etching gel (20 s; Ivoclar Vivadent, Canada) was applied to the internal surface, washed and dried, a silane coupling agent (Monobond S, Vivadent, Schaan, Liechtenstein) was applied to the inner surface of the FDP (60 s).

The selected shade of dual polymerizing composite cement (Ivoclar Vivadent, Canada) was applied to the internal surface of the FDP. The FDP was gently inserted onto the teeth with finger pressure. A light-emitting diode lamp was applied circularly over the cervical regions for 15 s per tooth. Excessive cement was removed from the teeth and the final polymerization exposure was 60 s per tooth.

There was no mobility in the restored teeth at 3 years after the definitive treatment. In the clinical and radiological examinations, hard and soft tissues appeared normal (Figures 4a, 4b, 5). The patient expressed satisfaction with the restorations and with the esthetic image.



Figure 4b. Back view of definitive prosthesis after 3 years.



Figure 5. Periapical radiographic view after 3 years.

DISCUSSION

The rehabilitation of a retained primary tooth in an adult has always been a complex clinical problem. In the anterior region of the mouth especially, esthetic and speech requirements complicate the problem further. Treatment of hypodontia involves different branches of dentistry, such as orthodontics, dental surgery, implantology, conservative treatment, and prosthetics treatment.

Worsaae et al.¹⁰ used endosteal dental implants in 44 patients with severe hypodontia, and reported 98% success during a 5-year follow-up period. Saud et al.¹¹ tried to close the space between missing lateral teeth by dragging the maxillary canine teeth. Galiatsatos et al.¹² applied etched porcelain veneer crowns on primary canine teeth with hypodontia; they emphasized that results were satisfactory in terms of esthetics and function. Researchers have emphasized that composite veneer restorations provide easier manipulation, better esthetics, and are inexpensive. However, they tend to lose color and stability and they can become brittle over time.^{13,14} Abbo and colleagues¹⁵ restored the space, in the absence of mandibular central teeth, with four zirconium FDP members by extraction existing primary teeth. Lithium disilicate is used with all esthetic ceramic crowns, in the anterior and posterior regions, to withstand the forces associated with chewing. A 10-year 95.5% success rate has been reported for these types of restorations.⁹ Compared to other conventional therapies with existing primary teeth, restorations with the lithium disilicate ceramic restorations have many advantages. Treatment without extraction of teeth results in a finished treatment in a shorter time, because it is not necessary to wait for wound healing. Thus, the patient has an immediately enhanced esthetic image. Treatment with dental implants is difficult and costly. Because the space is very small, they often cannot be used. Treatment can also include extracting primary teeth, preparation of adjacent teeth, and a fixed dental prosthesis or adhesive restoration, such as the Maryland restoration. However, the survival rate of Maryland restorations is relatively short because they tend to lose adhesion to tooth surfaces.

In this clinical report, esthetic image was improved using lithium disilicate ceramic crowns without extraction of the primary teeth. With this restoration technique, the external surfaces of the primary teeth are enhanced. Thus, the patient was more comfortable, because the primary tooth seemed like a permanent central incisor. However, this situation

can generate periodontal problems. Primary teeth restored with lithium disilicate ceramic crowns do not have occlusion contact. It is not a serious problem for periodontal health. A clinical examination of the periodontium and a radiographic examination can help correct the issue (Figure 5).

CONCLUSION

The absence of a permanent tooth, or a retained primary tooth, can give rise to many esthetic and functional problems, especially in the anterior region. In this case, the diagnosis was hypodontia and primary teeth were restored with lithium disilicate, without extracting the primary teeth. The use of this treatment option provides many advantages. It is esthetically pleasing, inexpensive, non-invasive, and conservative, compare to conventional treatment options.

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