

Unilateral peg-shaped mandibular central incisor and direct composite resin treatment: A case report

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Abstract

Aim: This case report describes the restorative treatment process of a non-syndromic unilateral peg-shaped left mandibular central incisor.

Case presentation: A 23-year-old female patient was admitted for aesthetic concerns related to the appearance of the anterior mandible and a peg-shaped incisor. The color selection was done on clean, hydrated teeth. The teeth were roughened with a minimal red belt bur, a 37% phosphoric acid gel was applied to the enamel for 30 seconds, and the teeth were washed with water for 30 seconds to remove the acid agent. Following the application of a universal adhesive to the surface according to the manufacturer's instructions, the palatal and proximal walls were formed using a mylar strip and an A2B-colored resin composite. Then, polymerization of the restoration was completed using an incremental layering technique. After the removal of any excess restoration, low-speed finishing and polishing were done using aluminum oxide and flexible rubber polishing disks containing diamond particles. After the resin application, the treatment was completed.

Conclusion: To achieve optimal results in the treatment of patients, restorative treatment can be recommended, considering the position and condition of the tooth. When choosing the most appropriate treatment for a patient, the advantages and limitations of each technique should be carefully explained, and the most conservative treatment should be recommended.

Keywords: Dental anomalies, microdontia, peg-shaped teeth, resin composite, morphological disorders

Introduction

Developmental dental abnormalities are a significant kind of dental morphologic variation. Dental development anomalies are multifactorial, multilevel, multidimensional, progressive over time and complicated alterations that occur during the dental development process and involve genetic, epigenetic, and environmental variables (1). Genetic and environmental factors might trigger these events throughout the morphogenesis process or histo-differentiation tooth development phases. Anomalies in tooth shape, dimensions, tooth structure, form, quantity, and structure may emerge as a result of abnormal occurrences during embryologic development (2). Various morphological and structural disorders may occur in human teeth due to genetic factors (3), and there are also spontaneous or isolated cases in which no cause can be identified (4).

Microdontia can also be called "peg-shaped incisor" which is called "conical tooth" and a condition where the incisors are too small in size and are usually accompanied by a tapered tooth shape (2). Non-syndromic microdontia is not often seen in permanent mandibular incisors. True microdontia is extremely rare in a healthy person without any syndrome or positive medical history. Peg incisors can affect patient psychology due to their small shape and size, which are incompatible with other teeth and can distort the smile (5). There are only a few cases of mandibular peg incisors in the literature (3, 6).

The aim of this case report is to describe the restorative treatment procedures of a non-syndromic unilateral peg-shaped left mandibular central incisor.

Case Presentation

A 23-year-old female patient was admitted for aesthetic concerns related to the appearance of the anterior mandible and a peg-shaped left mandibular central incisor (Figs. 1a and 1b). There was neither pulpal nor periodontal deterioration in the peg-shaped incisor. The patient's permanent teeth had erupted, and there were no missing or impacted teeth. The peg-shaped incisor had a normal root length without any evidence of pulp stones.

The patient was referred for orthodontic treatment as there was a shift in the midline, but the patient refused the orthodontic treatment. The use of an indirect porcelain veneer or direct resin composite veneer treatment of the peg-shaped tooth was explained to the patient as the most appropriate conservative option. The patient requested immediate treatment that was not very expensive. Hence, the patient was provided with a reformation of the peg-shaped left mandibular central incisor tooth with a direct resin composite. The treatment plan was explained to the patient and approved by the patient.



Figure 1a. Peg-shaped left mandibular central incisor



Figure 1b. Appearance of the anterior mandible

First, color selection was made on clean, hydrated teeth. The teeth were roughened with a minimal red belt bur, a 37% phosphoric acid gel (FineEtch; Spident, Incheon, South Korea) was applied to the enamel for 30 seconds, and the teeth were washed with water for 30 seconds to remove the acid agent. Following the application of a universal adhesive (G-Premio Bond; GC Corporation, Tokyo, Japan) to the surface according to the manufacturer's instructions, the palatal and proximal walls were formed using a mylar strip and an A2B-colored resin composite (Estelite Asteria; Tokuyama Dental, Tokyo, Japan). Then, polymerization of the restoration was completed using a polymerization device (3M Elipar™ Deep Cure-S LED, St. Paul, MN, USA) and an incremental layering technique.

The resin composite was applied in layers of ≤ 2 mm, and each layer was polymerized for 20 seconds. After the polymerization process was completed, the mylar strip was removed, and the patient's occlusion was controlled with articulation paper. Contouring was performed using a yellow-banded diamond knife-edge bur under water cooling. After removal of the excess restoration, low-speed finishing and polishing were done using aluminum oxide disks (Optidisc; KerrHawe, Bioggio, Switzerland) and flexible rubber polishing disks (Twist Dia; Kuraray, Japan) containing diamond particles (Figure 2a, 2b).



Figure 2a. After restorative treatment of peg-shaped left mandibular central incisor.



Figure 2b. After restorative treatment of left mandibular central incisor with occlusal closure

Discussion

A thorough examination of dental abnormalities is required to avoid malocclusion, aesthetic deformities, periodontal disease, caries, and complications during tooth extraction and root canal therapy. In addition to clinical exams, radiographic findings aid in the differential diagnosis of congenital abnormalities (2). Microdontia may include different tooth contours and morphologies. One example of localized microdontia in the literature is of the maxillary lateral incisors, called 'peg lateral'. Peg-shaped teeth are anterior primary or permanent teeth that decrease markedly from the cervical margin to the incisor. The reported prevalence ranges from 0.8%-8.4% of the population (6).

Evidence suggests that early detection of dental abnormalities is important because it improves prognosis, allows for better planning of orthodontic and/or surgical-prosthetic therapy, and may avoid or reduce significant treatments and/or intercept issues with permanent dentition development (2).

Resin composite materials have been found successful in modern biomaterial studies because they change biological tissue in terms of both appearance and function (7). There are many reasons for choosing these materials in restorative dentistry: their easy manipulation, patient demands for restorations with a natural appearance, the less invasive nature of composite restorations, and significant developments such as increased durability (8). It is based on a

comprehensive understanding of the individual components of resin composites and methodological considerations for replacing each component (7). Evidence shows that the mechanical properties of resin composites are significantly affected by filler particle morphology (shape), size range, and volume content (9, 10). Increasing demand for esthetic dentistry has led to the development of resin composites for direct restorations (11). Resin composites allow quick and simple modification of the morphology of tiny teeth.

Function, aesthetics, extraction requirements, the position of the canine teeth, and the possibility of coordinating restorative and orthodontic treatment should be considered when deciding on a treatment plan.

Conclusion

Studies have reported that cases of microdontia in mandibular central incisors are rare. In this case report, the restorative treatment process of a non-syndromic unilateral peg-shaped left mandibular central incisor is explained.

To achieve optimal results in the treatment of patients, restorative treatment can be recommended, considering the position and condition of the tooth. When choosing the most appropriate treatment for a patient, the advantages and limitations of each technique should be carefully explained to the patient, and the most conservative treatment should be recommended.

Disclosures

Patient Consent for Publication: Written informed consent was obtained from the patient.

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