Interdisciplinary Management of Non-syndromic Oligodontia with Multiple Retained Deciduous Teeth: A Rare Case Report

Abstract

Oligodontia is agenesis of six or more teeth excluding the third molars. The mandibular second premolar is the most frequently missing tooth after the third molar. Oligodontia of permanent teeth is usually associated with retained primary teeth. The absence of permanent teeth in young patients can cause aesthetic, functional and psychological problems. Dental treatment of oligodontia with retained deciduous teeth generally requires an interdisciplinary approach. There may be various treatment options for retained deciduous teeth: retain, retain and modify, extraction and prosthetic replacement, extraction and space closure. The purpose of this article is to report a rare case of non-syndromic oligodontia with agenesis of eight permanent teeth excluding the third molars and multiple retained deciduous teeth in a 20-year old female patient.

Keywords: Oligodontia, Retained primary teeth, Interdisciplinary treatment.

Introduction

Tooth development is a complex process, in which sequential interactions between epithelial and mesenchymal cells regulate cell activities like proliferation, condensation, migration, and differentiation. These lead to the formation of a functional tooth organ. Dental agenesis is one of the most common developmental anomalies in permanent dentition. Various terminologies have been used to describe the agenesis of teeth in the primary or permanent dentition. Hypodontia is agenesis of one or few teeth (up to six); oligodontia is agenesis of six or more teeth excluding the third molars and anodontia is the extreme of oligodontia where there is total absence of any dental structure. The prevalence of hypodontia in the primary dentition ranges from 0.08% to 1.55% and in the permanent dentition, range from 2.3% to 11.3% depending on the population investigated. Oligodontia has prevalence of 0.3% in permanent dentition and females are affected more frequently than males by a ratio of 3:2. The mandibular second premolar is the most frequently missing tooth after the third molar, followed by the maxillary lateral incisor and the maxillary second premolar. Agenesis of maxillary central incisors, canines or first permanent molars seems to be rather exceptional. Hypodontia and oligodontia are classified as isolated or non-syndromic and syndromic. Oligodontia is often associated with specific syndromes and/or severe systemic abnormalities, while anodontia is commonly seen in severe cases of ectodermal dysplasia. The etiology of oligodontia is unknown; however, both environmental and genetic factors can cause a failure of tooth development. Environmental factors include children treated with irradiation at tooth developing stages or those in whom chemotherapeutic agents have been administered. Genetic factors are constituted by two mutated genes, MSX-1 and PAX-9 in humans.

Oligodontia of permanent teeth is usually associated with retained primary teeth. The purpose of this article is to report a rare case of non-syndromic oligodontia with agenesis of eight permanent teeth excluding the third molars and multiple retained deciduous teeth in a 20-year old female patient.
Diagnosis Criteria

All primary teeth have erupted by the age of 3 years and all permanent teeth except third molars between the ages of 12 and 14 years. Therefore, 3-4-year-old children are suitable for diagnosis of congenitally missing primary teeth by clinical examination and 12-14-year-old children, for diagnosis of permanent teeth excluding the third molars. The use of panoramic radiography is recommended, together with intraoral periapical radiographs and clinical examination for the detection or confirmation of dental development and performing the diagnosis of dental agenesis.

Case Report

A 20-year-old female patient reported to the department of orthodontics, with a chief complaint of spacing in upper front teeth. The patient’s past medical history and the family history were not significant. General examination revealed no abnormalities of the skin, hair or nails. Extraoral examination revealed a well-balanced face with normal facial profile and normal skeletal dental base relations. On intraoral examination, only 20 permanent teeth were present clinically. The teeth present were normal in size, shape and color. Multiple retained deciduous teeth (52, 53, 55, 65, 75, 85) were present. A 3-mm of maxillary midline diastema was present.

Maxillary canines were in cross-bite relation. There was mild crowding in the lower arch for which patient was not concerned. Oral hygiene and gingival status were good and no caries was found. The orthopantomographic examination revealed agenesis of twelve permanent teeth including third molar (Fig. 1). The missing teeth were 12, 15, 17, 18, 22, 25, 27, 28, 35, 38, 45, 48. No significant root resorption was found in deciduous teeth. The ophthalmological, dermatological and neurological examination of the patient revealed no pathological symptoms and no signs of mental retardation. Based on the above findings, the case was finally diagnosed as non-syndromic oligodontia of eight permanent teeth excluding the third molars.

Treatment Alternatives

There were two treatment options:

(1) Extraction of 52 and 53 followed by fabrication of crowns for missing maxillary lateral incisors after space creation

(2) Extraction of 52 and 53 followed by space closure in maxillary arch, recontouring of canines into lateral incisors and first premolars into canines. In lower arch extraction of first premolars or second deciduous molars followed by space closure to maintain positive overjet and facilitate space closure in maxillary arch.

We selected first treatment option because after extraction of deciduous molars in the lower arch, space would be too large to close and it is not wise to extract permanent teeth (first premolars) in oligodontia patients.
Treatment Progress

Treatment progresses as following:

The treatment was performed with the straight-wire technique, using metallic orthodontic brackets in maxillary arch only, according to Roth’s prescription (0.022×0.028-in) (Fig. 2).

1. Extraction of 52 and 53 was done.
2. Fixed-bite plane was given in lower arch to raise the bite in the anterior region for cross-bite correction.
3. Alignment and levelling started with 016 thermal NiTi followed by 017×025 thermal NiTi and 018×025 SS.
4. Midline diastema was closed with help of elastomeric chain.
5. Space was created for missing maxillary lateral incisors.

After gingivectomy in maxillary canines and root canal treatment in maxillary central incisors, porcelain fused to metal bridge was fabricated from central incisors to canines on both sides. Banding or bonding was not done on maxillary deciduous molars to avoid any orthodontic force. No treatment was done in the lower arch.

After 14 months of total treatment time, aesthetically pleasing smile was achieved and retained deciduous teeth were well maintained (Fig. 3). In this case, we followed interdisciplinary approach of orthodontics, endodontics, periodontics and prosthodontics.
Discussion

The absence of permanent teeth in young patients can cause aesthetic, functional and psychological problems. A number of factors must be taken into account for planning and success of the treatment, like the age of the patient, number of missing teeth, the location of missing teeth, associated malocclusion, expectation and socioeconomic status of the patient. Dental treatment of oligodontia with retained deciduous teeth generally requires an interdisciplinary approach. Radiographic assessment of retained deciduous teeth should include the length and form of the remaining root structure, ankylosis, periodontal support, and if previous films are available, the rate of root resorption.

There may be various treatment options for retained deciduous teeth: retain, retain and modify, extraction and prosthetic replacement, extraction and space closure. If the root and coronal structure are good, the tooth is functionally and aesthetically acceptable, and there is no compelling orthodontic need for extraction, a primary tooth may be retained intact beyond 20 years. Where root and crown structure are good but infra-occlusion has occurred or aesthetic improvement is required, the primary tooth may be retained and reshaped with the help of restorative materials.

Where crowding or proclination exists and an extraction is necessary in order to align the arch orthodontically, it is usually common to extract the retained primary teeth but there will be difficulty in space closure due to large mesiodistal dimension of deciduous molars. When prognosis of retained deciduous teeth is poor then extraction and prosthetic replacement is choice of treatment. In case of ankylosis, early extraction is recommended but in young adults it may lead to ridge defect. The ridge narrows by 25% during the first 4 years after deciduous tooth extraction.

Progressive slicing of deciduous molars to relieve crowding or proclination of anteriors is also suggested.

Conclusion

Marked oligodontia demands coordinated treatment planning and appropriate timing of the delivery of care by various dental specialties. Planning for space management is best carried out before initiating orthodontic treatment. A diagnostic setup is an essential adjunct to the treatment planning process. Careful consideration should be given to the timing of extraction of primary teeth. Orthodontic and prosthetic rehabilitation will restore the proper function of the stomatognathic system and ensure better quality of life in the cases of oligodontia.

Conflict of Interest: Nil

References