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Case Report

Non- syndromic oligodontia: A case report

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ABSTRACT

This case report presents a 14-year-old patient diagnosed with non-syndromic oligodontia, characterized by the absence of multiple permanent teeth. Treatment involved the placement of zirconia crowns in the maxillary arch and a flexi denture in the mandibular arch to address aesthetic and functional concerns. The patient's condition was thoroughly assessed, considering both dental and soft tissue parameters, revealing a trend towards specific dentofacial changes associated with the increasing number of missing teeth. Psychosocial implications such as depression and impaired speech were also considered in treatment planning. A multidisciplinary approach was adopted, involving prosthetic, orthodontic, and restorative interventions. The choice of zirconia crowns and flexi denture aimed to restore aesthetics, masticatory function, and speech. This case highlights the successful management of non-syndromic oligodontia in a young patient through a comprehensive treatment strategy, emphasizing the importance of tailored interventions to address the unique challenges posed by this condition.

1. Introduction

Agenesis of teeth is a frequently encountered developmental abnormality in humans. Hypodontia, defined as the absence of five or fewer permanent teeth excluding third molars, and oligodontia, characterized by the absence of six or more permanent teeth excluding third molars, are commonly observed. Anodontia refers to the complete absence of deciduous and/or permanent teeth.[1]

The prevalence of oligodontia is estimated at 0.3%, with a higher occurrence among females compared to males at a ratio of 3:2.[2–4] Oligodontia can occur in isolation or as part of various syndromes, including ectodermal dysplasia, Rieger's syndrome, oto-palato-digital syndrome, Witkop syndrome (tooth and nail syndrome), oro-facial-digital syndrome, and oculo-facial-cardio-dental syndrome. Syndromic cases often present additional abnormalities in the skin, nails, eyes, ears, or skeleton.[4,5]

Commonly observed tooth absences in oligodontia include the non-appearance of maxillary lateral incisors, maxillary second premolars, and mandibular central incisors. Conversely, the absence of maxillary central incisors, maxillary or mandibular canines, or first permanent molars is less frequently encountered. In addition to congenital tooth absences, individuals with oligodontia often manifest various dental and oral complications. These encompass reduced size and structure of teeth and the adjacent alveolar processes, delayed tooth eruption, retention of primary teeth beyond normal periods, anomalies in enamel formation, widened interdental spaces, the occurrence of cleft lip/palate, pseudo-gaps between teeth (diastema), and a pronounced overbite. Furthermore, the remaining teeth may exhibit discrepancies in size, shape, and growth rate, with the permanent dentition typically displaying more pronounced effects compared to the primary dentition. Functional problems with speech

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and chewing are frequently encountered, though challenges related to appearance, normal physiological function, and psychological well-being can also emerge from an early age.[5]

Treatment strategies often involve orthodontic procedures to create or close spaces before considering prosthetic options. These may include using adhesive dental restorations, removable or fixed partial dentures, implant-supported replacements, or a combination of these approaches.

This case study presents a comprehensive treatment approach for a 14-year-old patient diagnosed with non-syndromic oligodontia, characterized by the absence of 16 permanent teeth.

2. Case Report

2.1. Pre-treatment

A 14-year-old female patient was directed to the Department of Pediatric and Preventive Dentistry in Ahmedabad due to concerns about her smile and the need for tooth replacement. Upon examination, facial asymmetry was noted along with a slight decrease in the lower face's height, resulting in a flat profile (see Figure 1). The nasolabial angle, which denotes the angle between the nose and upper lip, was within normal parameters. Additionally, the lower lip appeared full, protruding slightly beyond the upper lip when closed.". A pronounced crease beneath the lower lip (mento-labial sulcus) was evident, and heightened activity of the chin muscle (mentalis muscle) was noticeable upon lip closure, manifesting as visible movement under the skin.

Figure 1: Side facial profile

Internally, examination within the mouth revealed the absence of 16 permanent teeth.(Figure 2) The missing teeth were maxillary left and right 1^{st} and 2^{nd} premolar, maxillary left and right lateral incisor, maxillary left central incisor, mandibular left and right 1^{st} pre-molar and mandibular left 2^{nd} premolar, mandibular left and right canine, lateral incisor and central incisor. The third molars were clinically absent and presence of over retained deciduous maxillary right and left 1^{st} and 2^{nd} molar, mandibular left 2^{nd} molar and mandibular right 1^{st} and 2^{nd} molar.

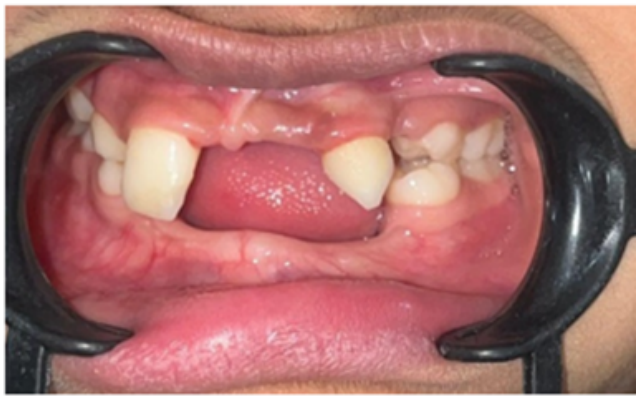

Figure 2: Intra oral examination

Diagnostic records included an orthopantomogram, and study models. (Figure 3) There was no significant medical history. A referral to a pediatrician confirmed that there was no systemic or syndromic involvement. Blood investigation tests, thyroid function tests, and karyotyping performed were inconclusive. The family history revealed that her father also has oligodontia. There was history of trauma before 2 years and avulsion of 21,22 and extrusion of 11 and 23 were reported. The diagnosis of non-syndromic oligodontia was made.

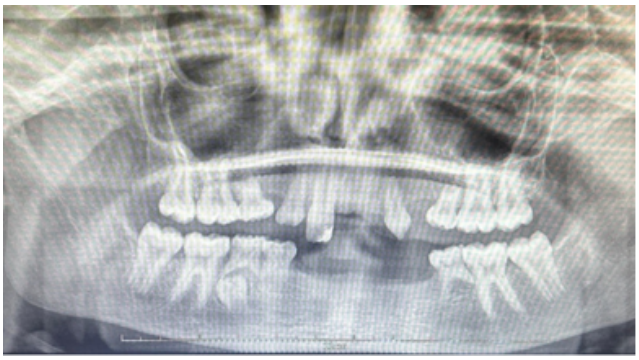

Figure 3: Orthopantogram|

2.2. Treatment

After careful evaluation and due consideration, a decision was taken to restore the functions and esthetics of the

patient. Vitality test i.r.t 11,23 and tooth were non-vital. Root canal treatment were performed under rubber dam isolation i.r.t 11, 23. Flexible partial denture i.r.t 43,42,41,31,32,33 in mandibular arch and zirconia bridge i.r.t 13,11,21,22,23 in maxillary arch.

An alginate impression of the mandibular arch was taken. For maxillary arch records and maxillo-mandibular jaw relation was recorded using intra-oral scanner.(Figure 4) The denture was inserted, and the patient guided regarding its usage, cleanliness, and maintenance with instructions to maintain oral hygiene. Zirconia bridge were fabricated using CAD CAM and luted using Resin modified glass ionomer cement.(Figure 5)

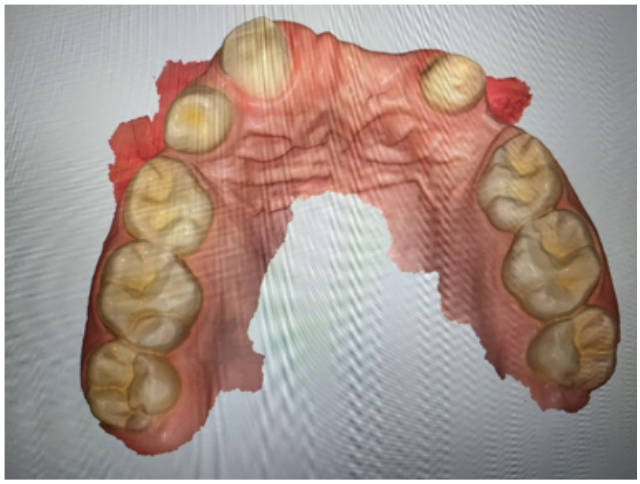

Figure 4: Intraoral scan

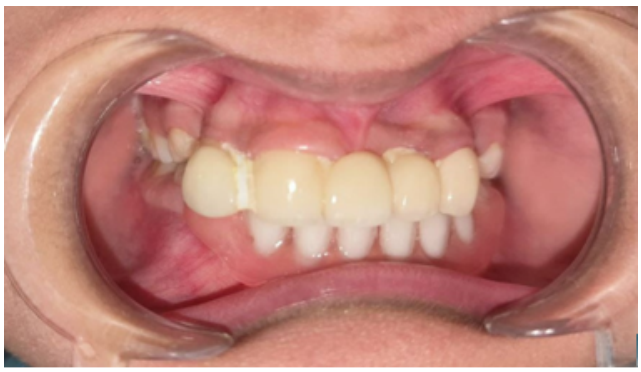

Figure 5: post operative

3. Discussion

Oligodontia, a rare condition with an overall prevalence of 0.14%, manifests differently across various populations.[6] Its occurrence in permanent dentition stands at 0.3%, while in primary dentition, it ranges from 0.5% to 0.9%.[7] This condition may manifest independently, as part of a syndrome, or in more severe systemic disorders such as ectodermal dysplasia. Syndromic cases often present with accompanying skin, nail, eye, ear, or skeletal abnormalities. However, the current patient lacks typical syndromic features such as dry skin, brittle hair, a prominent forehead, wide-set eyes, or issues with body-heat regulation.[8] Instead, they appear to be a healthy child with a familial history of missing teeth. Additionally, the patient's characteristics do not correspond to any specific ectodermal dysplasia or syndrome. Therefore, the diagnosis is non-syndromic oligodontia.[9]

Studies have identified mutations in MSX1 and PAX9 in families with non-syndromic familial oligodontia.[7–10] While environmental factors can sometimes induce oligodontia, there's no suggestive history of such influences in this case. Conducting genetic analysis is imperative for accurately comprehending the mutation. In this instance, the absence of 16 permanent teeth presents an exceedingly rare occurrence. Research indicates that the predominant pattern in the lower arch entails the absence of all mandibular premolars. Additionally, common lower arch patterns include the absence of incisors, canines, both premolars, and the second molar. In the maxilla, prevalent patterns comprise the absence of the maxillary lateral incisor and both premolars, while in the mandible, it predominantly involves the absence of all mandibular premolars.[11] As the count of missing teeth rises, there's a noticeable trend towards in individuals with severe hypodontia, there is typically a decrease in the mandibular plane angle, an increase in the facial axis, and a reduction in the lower anterior facial height. This dentofacial structure is often a result of dental and functional compensations rather than altered growth patterns.[12] Patients with oligodontia commonly face aesthetic concerns, such as missing teeth and overclosure, which can lead to psychological challenges such as depression and social issues. Therefore, the primary goal of treatment is to improve appearance, mastication, and speech. Treatment typically involves a multidisciplinary approach, including prosthetic, orthodontic, restorative, and surgical interventions. Prosthetic options for oligodontia include removable partial dentures, fixed partial dentures, attachment dentures, and overdentures, selected based on the condition of the remaining teeth. Surgical interventions like auto-transplantation, osteo-integrated implants insertion, or orthognathic surgery being viable options.[13] Often, an integrated orthodontic-restorative-surgical strategy is indispensable, involving orthodontic interventions focused on establishing adequate space for subsequent conventional fixed prostheses or implants.[14]

4. Conclusion

In conclusion, this case report highlights the management of non-syndromic oligodontia in a 14-year-old patient, a treatment plan was devised involving the application of

zirconia crowns in the maxillary arch and flexi dentures in the mandibular arch. This approach aimed to effectively manage the condition and restore dental function and aesthetics without relying on syndromic interventions. The utilization of these prosthetic solutions not only addressed the aesthetic concerns and functional deficits associated with the condition but also contributed to the patient's psychosocial well-being. The treatment approach underscores the importance of a multidisciplinary approach in managing oligodontia, where orthodontic, restorative, and surgical interventions may be necessary for optimal outcomes. Furthermore, the use of zirconia crowns and flexi dentures demonstrates the versatility and effectiveness of contemporary prosthetic options in restoring dental function and enhancing patient satisfaction. Continued monitoring and follow-up will be essential to assess the long-term stability and success of the treatment provided. Overall, this case report serves to enrich our understanding of non-syndromic oligodontia management strategies and emphasizes the importance of personalized treatment plans tailored to individual patient needs.

5. Source of Funding

None.

6. Conflict of Interest

None.

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