

A Conservative Approach towards Aesthetic, Functional, and Psychological Management of Non-Syndromic Oligodontia Patient: A Case Report with 12-Year Follow-up

Abstract

Dental agenesis is the most common developmental aberration in humans, and it is typically linked with a variety of other oral anomalies. Oligodontia, anodontia, and hypodontia are the words used in the literature to denote missing teeth. Although tooth agenesis is not a serious public health problem, it can cause speech, masticatory, aesthetic, and functional problems. A multidisciplinary approach is necessary to establish comprehensive treatment planning, counselling sessions, and frequent follow-ups, to obtain stable, functional, and psychological rehabilitation, which will eventually improve the patient's quality of life. In this case study, after considering the young age and growth of the patient and also his financial status, a conservative approach to rehabilitate the non-syndromic oligodontia patient with a 12-year follow-up and fabrication of maxillary overlay denture and mandibular conventional complete denture has been discussed.

Keywords: Anodontia, congenital missing teeth, hypodontia, non-syndromic oligodontia, overlay denture, tooth agenesis

Introduction

Congenital missing teeth, whether complete (anodontia) or partial (hypodontia or oligodontia), can be caused by aplasia of dental lamina due to hereditary or environmental factors. Tooth agenesis is a widespread developmental defect affecting 2.2%–10% of the general population. Hypodontia is characterised by congenital absence of less than six teeth, whereas oligodontia has more than six missing either primary or permanent dentition.^[1]

Congenital missing teeth are often associated with different syndromes and underlying diseases. Few cases are mentioned in literature that has oligodontia as a distinct entity referred to as non-syndromic oligodontia.^[2] Most commonly affected genes in non-syndromic oligodontia are MSX1 and PAX9. It can be induced by one or more point mutations in a closely linked polygenic system, which is passed down in an autosomal dominant pattern with inadequate penetrance.^[3]

Clinical symptoms vary according to the number and location of missing teeth

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that affects the maxillofacial growth and alter the facial appearance. Existing teeth may undergo positional alterations, and morphological and size changes, which leads to loss of function, compromised aesthetics, and have negative psychological impacts to patient and family members.^[4]

In the present case, considering the patient's young, developing age, and constraint financial status, a conservative approach was planned. This clinical report discusses the rehabilitation of non-syndromic oligodontia patient with removable overlay denture, which act as transitional denture to maintain the vertical dimension and occlusal integrity of the patient.

Case Presentation

A 6-year-old young male reported with complaint of non-eruption of teeth and difficulty in mastication. History revealed multiple congenital missing teeth [Figure 1A] with no relevant medical history, no family history of congenital missing teeth, and no history of dental trauma. Extraorally, patient had senile appearance, abnormal lip support, and sparse hair

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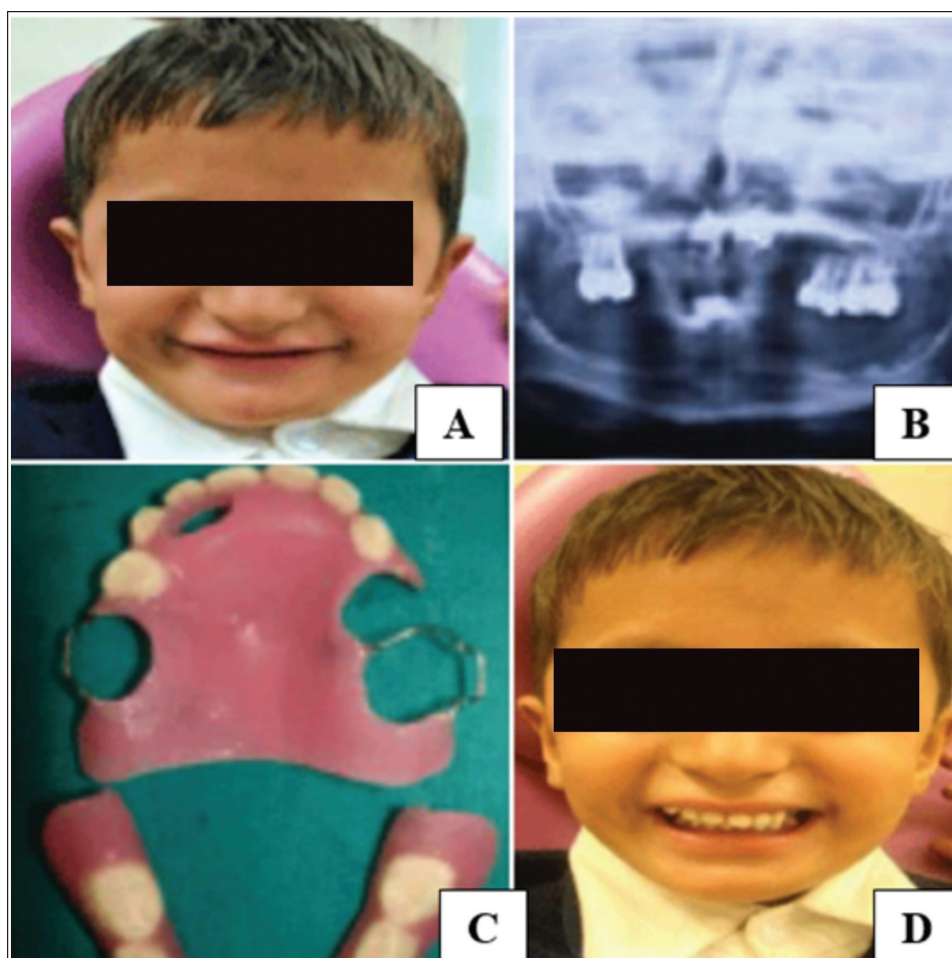


Figure 1: (a) Pre-operative view, (b) panoramic view showing of maxillary and mandibular arch, (c) maxillary and mandibular removable partial denture, and (d) post-operative view

growth in temple and eyebrows region with no frontal or temporal bossing. Intraorally, deciduous molars in maxillary arch and completely edentulous mandibular arch with resorbed alveolar ridge were noted. Radiographic examination revealed the absence of tooth buds of permanent teeth except for tooth buds of maxillary central incisors [Figure 1B]. The peripheral blood sample revealed normal male karyotype (46 XY) with no chromosomal abnormalities. Complete blood count with serum calcium and phosphate level and thyroid hormones (T3 and T4) were normal. Ectodermal dysplasia, Rieger syndrome, and Van Der Woude syndrome were ruled out.

A final diagnosis of non-syndromic oligodontia was made. Since the patient was in mixed dentition, rehabilitation with mandibular complete denture and maxillary removable partial dentures was planned and delivered to the patient [Figure 1C]. Parents were educated for frequent follow-up and change in prosthesis to accommodate age changes [Figure 1D].

The patient was re-examined at 12 years of age. Extraorally, all ectodermal structures were normal. Intraorally, there was partially erupted 11, 21, 16, and 26 in maxillary arch and completely edentulous mandibular arch. After required

restoration and prophylaxis, a tooth-supported maxillary overlay denture and conventional mandibular complete denture were fabricated for the patient [Figure 2A–E].

The patient reported back to the department for subsequent follow-up at 19 years of age. Extraorally, the patient had sparse fine-hairs and no abnormality in nails [Figure 3A]. Intraorally, completely edentulous resorbed mandibular arch and four maxillary permanent teeth with abnormal morphology (11, 21, 16, and 26) and constricted maxillary arch were noted. The remaining teeth were carious with inflamed gingiva [Figure 3B and C]. Complete prophylaxis and restoration of carious teeth were done after radiographic evaluation [Figure 3D]. Oral rehabilitation with a metal mesh reinforced maxillary removable overlay denture and mandibular complete denture was planned.

Maxillary and mandibular primary impressions were made using irreversible hydrocolloid impression material (Algitek Alginate Impression Material-Dental Product of India, Rudrapur, Uttarakhand, India) [Figure 4A], and the primary cast was retrieved. Custom trays were fabricated, conventional border moulding was done followed by functional impression using addition silicone light body impression material

(Avuegum Light body; Dental Avenue, New Delhi, India) [Figure 4B and C]. The cast was poured using type I stone (labstone dental plaster; Kalabhai Karson Pvt Ltd., Vikhroli West, Mumbai, Maharashtra, India), over which acrylic denture base with occlusal rims was fabricated [Figure 4D].

Maxillomandibular jaw relation was recorded followed by articulation on a semi-adjustable articulator and teeth

arrangement [Figure 4E and F]. Trial denture was evaluated in the patient's mouth [Figure 5A and B]. After flasking of maxillary and mandibular dentures, de-waxing was done. During the packing of heat-polymerising acrylic resin, a metal mesh was incorporated to increase the flexural strength of the denture [Figure 5C and D]. After processing of denture by compression moulding technique, denture was retrieved followed by trimming and polishing of denture. The prosthesis was delivered and post-rehabilitative instructions were given [Figure 5E and F].

Discussion

Research shows that more than 80% of hypodontia patients had one or two congenitally missing teeth, with less than 1% having six or more. It is an uncommon disorder with a 3:2 female-to-male incidence ratio.^[5] The deciduous maxillary lateral and mandibular central incisors were the most frequently affected, whereas mandibular second premolars and maxillary lateral incisors were most likely to be lost in permanent teeth.^[6]

Several theories concerning the aetiology of hypodontia have been proposed including genetic and environmental factors. Literature suggests that hypodontia may have a detrimental effect on quality of life as it imposes an aesthetic, functional, emotional, and economical burden on affected patients. Hypodontia is a lifetime problem requiring extensive treatment planning for optimal treatment outcomes.^[6,7]

Hypodontia may result in deep bite and spacing in case of anterior missing teeth, whereas non-working side

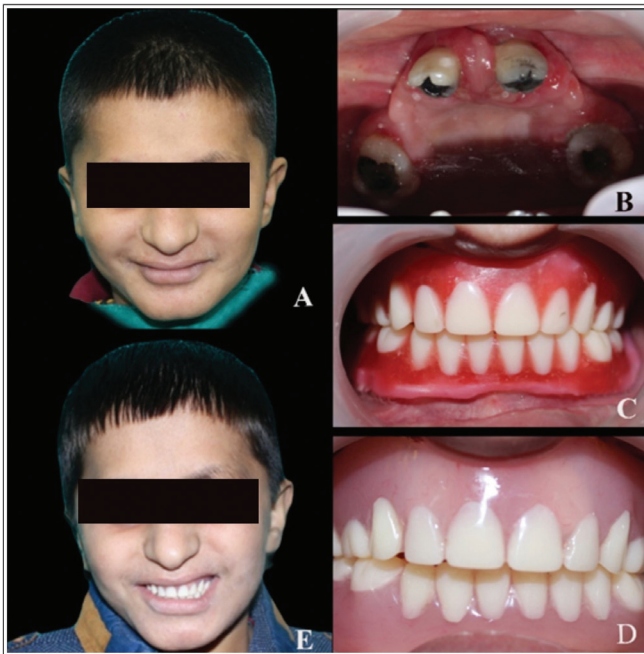


Figure 2: (a) Pre-rehabilitative view, (b) maxillary intraoral view, (c) trial denture try-in, (d) final prosthesis *in situ*, and (e) post-rehabilitative view



Figure 3: (a) Pre-operative view, (b) maxillary intraoral view, (c) mandibular intraoral view, and (d) after phase I therapy

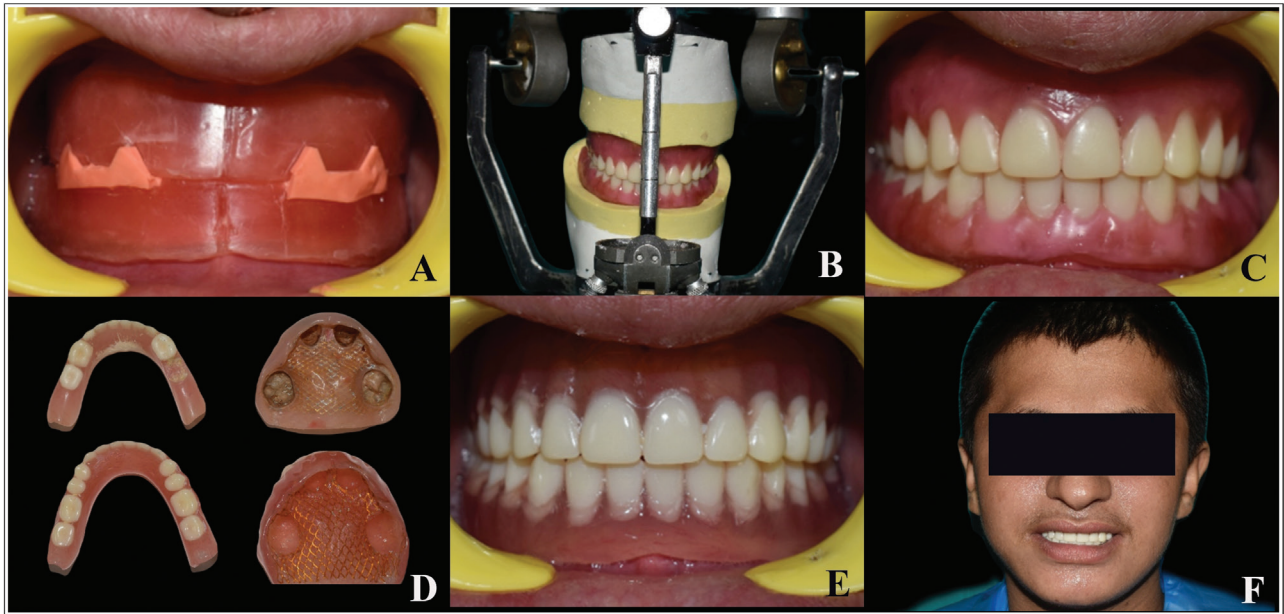


Figure 4: (a) Primary impression, (b) maxillary functional impression, (c) mandibular functional impression, (d) master cast, (e) jaw relation, and (f) maxillary and mandibular cast articulated in semi-adjustable articulator

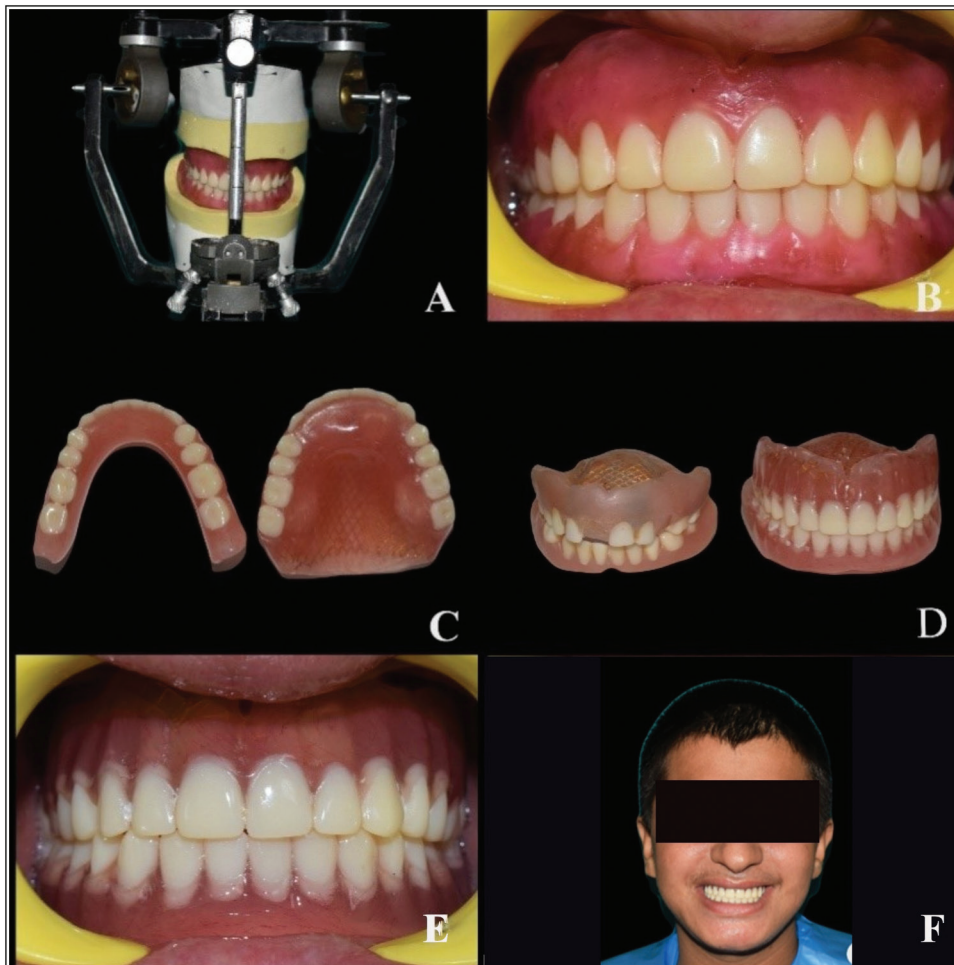


Figure 5: (a) Teeth arrangement, (b) try-in, (c) final prosthesis (occlusal view), (d) comparison of old and new denture, (e) final prosthesis *in situ*, and (f) post-rehabilitative view

interferences, overeruption of opposing teeth, and poor gingival contouring in case of posterior missing teeth. These patients may have masticatory difficulties when deciduous teeth associated with missing permanent teeth are exfoliated.^[8] It also has a psychological impact due to social exclusion, especially in young patients due to unpleasant senile appearance and speech difficulties. Furthermore, the lack of homogeneity of the occlusal plane, supraeruption of opposing teeth, loss of vertical dimension, and bone morphology in edentulous region add up difficulties in prosthodontic rehabilitation.^[9]

To obtain the desired outcomes, a multidisciplinary team approach including orthodontics, oral and maxillofacial surgery, and prosthodontics is necessary. Objectives should include restoring stable occlusion and assisting with psychosocial adjustment.^[10] Prosthetic replacement includes various treatment options according to age and severity of the syndrome such as conventional complete and removable partial dentures,^[5] flexible dentures,^[1] Cu-sil dentures, adhesive partial denture, overdentures, fixed partial dentures,^[2] and implant-supported dentures. Implant-supported or retained prosthesis is the beneficial treatment, but considering the patient's bone and soft-tissue quality and financial status, it was excluded.

In this case report, we fabricated a removable maxillary overlay denture and mandibular complete denture as it serves as a simple, convenient, and conservative option permitting changes that are anticipated but not defined. It also allows quick changes in the design of the restoration for customised care in accordance with the growth pace and status of the existing erupted and non-erupted teeth although patient's cooperation remains desirable with any removable prosthesis.

Conclusion

Although hypodontia is commonly associated with numerous syndromes, the non-syndromic feature of hypodontia should also be examined. Furthermore, this problem should be managed as early as possible to preserve the prosthetic and cosmetic functioning of the teeth. During early childhood and adolescence, a conservative approach should be carried out, which permits us to design prosthesis based on clinical conditions and also allows us to adjust or change the prosthesis based on the patient's growth.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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