

The Rehabilitation of Non-Syndromic Oligodontia with an Overlay Denture: A Case Report

Vandana Pathak¹ Mainakkanti Saha² Rajeev Srivastava³ Manish Bhalla⁴ Meenakshi Sharma^{5*}
Gunjan Singh⁶

¹Senior Lecturer, Department of Prosthodontics, College of Dental Sciences and Hospital, Rau, MP, India.

²Professor and Head, Department of Prosthodontics, College of Dental Sciences and Hospital, Rau, MP, India.

³Professor, Department of Prosthodontics, Modern College of Dental Science and Research Center, Indore, MP, India.

⁴Reader, Department of Pedodontics, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India.

⁵Assistant Professor, Department of Pedodontics, Government Dental College and Hospital, Jaipur, Rajasthan, India.

⁶PG Student, Department of Pedodontics, Jaipur Dental College and Hospital, Jaipur, Rajasthan, India.

ABSTRACT

Background: Oligodontia is the agenesis of six or more teeth which do not include the third molars. Oligodontia is one of the most common developmental abnormalities in humans. The principal clinical features of oligodontia are reduction in number of teeth, changes in the morphology of teeth, their eruption time and improper development of alveolar ridges. Prevalence of Oligodontia is 0.35% in Indian population. The present case report highlights the prosthetic rehabilitation of a 15-year-old female patient suffering from oligodontia. The treatment comprised of fabrication of overlay dentures on mixed dentition in maxillary and mandibular arches. This approach restored not only masticatory function but also ensured esthetic rehabilitation thus enhancing the self-esteem of the patient for social acceptance.

Keywords: Hypodontia, Oligodontia, overlay denture.

INTRODUCTION

The treatment of developmental and congenital anomalies is a big challenge to the prosthodontist due to the complex aesthetic and functional requirements in these clinical situations. Oligodontia may be defined as “the formation of less than a full complement of teeth; many such teeth are smaller than normal”(GPT-8)¹. Hobkirk and Brook (1980) considered “severe hypodontia” to be synonymous with oligodontia and defined it as “six or more congenitally missing teeth”². Schalk van der Weide (1992) proposed the criterion “six or more permanent teeth (excluding third molars)”, and since then, this definition has been increasingly used in dentistry.³ As oligodontia can occur in isolation (I) or as part of a syndrome (S), classifying oligodontia as oligodontia/I and oligodontia/S was suggested.

In order to prevent aesthetic and functional problems in dentition the diagnosis and treatment of hypodontia/oligodontia should be done at early stages. The treatment planning of oligodontia/hypodontia is more complicated as the clinical situation often presented warrants the preservation of the remaining natural teeth and the residual alveolar ridge. The current article describes the functional and esthetic restoration of a patient with oligodontia.

CASE REPORT

A 15 year old female patient reported to the Department of Prosthodontics, Crown Bridge and Implantology, with a chief complaint of missing teeth (Fig 01.). Past medical history revealed growth insufficiency and hearing deficiency since childhood. No familial history was reported. Intra

Received: Mar. 11, 2017; Accepted: May. 12, 2017

*Correspondence Dr. Meenakshi Sharma.

Department of Pedodontics, Government Dental College and Hospital, Jaipur, Rajasthan, India.

Email: dr.mesharma@gmail.com



Fig 1a: Preoperative front profile of the patient.



Fig 1b: Lateral profile of the patient.



Fig 2: Pre-operative OPG.

oral examination revealed mixed dentition with multiple missing deciduous and permanent teeth. There was no history of extractions. Orthopantomographic examination revealed multiple impacted and missing teeth. (Fig. 2)(Fig. 3)Routine blood biochemical examination revealed no abnormality.



Fig 3: Pre-operative intraoral photograph.



Fig 4: Maxillary and Mandibular Final Impression.



Fig 5: Maxillary and Mandibular Master Cast.



Fig 6: Orientation Jaw Relation.



Fig 7: Try in of the denture.



Fig 8: Maxillary and Mandibular Over Denture Insertion.

Clinical examination revealed underdeveloped maxilla with reduced vertical dimension. TMJ examination showed no abnormality. Based on radiographic and clinical examination, diagnosis of non syndromic oligodontia was made. The esthetic and functional rehabilitation of the patient necessitated the replacement of the missing teeth. The treatment plan considered for the patient included fabrication of maxillary and mandibular overlay denture on mixed dentition for functional and esthetic restoration (fig-09). The treatment plan was explained to the patient and informed consent was taken.

Maxillary and mandibular diagnostic impressions were made with irreversible hydrocolloid and diagnostic casts were prepared. Custom trays were fabricated and definitive impressions were made with medium viscosity vinyl polysiloxane and master casts were made. Following face bow transfer and jaw relation records, the casts were mounted on a semi adjustable articulator. After a satisfactory try-in

procedure, the overlay dentures were fabricated following standard protocol. Denture placement was done, post insertion instructions were given and the patient was placed on a standard follow up schedule.

DISCUSSION

Oligodontia can be presented as either syndromic or non-syndromic. It can be found in association with about 60 syndromes, but the non-syndromic form has been reported to be more common. According to different authors, the frequency of hypodontia is 1- 10% and oligodontia 0.1-0.9%^{4,5}. Anodontia occurs very rarely (17 cases were described over the last 50 years)⁶.

The list of all the genes and molecular pathways involved in tooth agenesis are shown in Table 1.⁷

Wnt/b-catenin/LEF1
MSX1
MSX2
SHH
P63
Pitx2
Runx2Cbfa 1

Table 1: The list of all the genes and molecular pathways involved in tooth agenesis.

Oligodontia can occur in association with genetic syndromes, such as ectodermal dysplasia, Incontinentia pigmenti, Down syndrome and Rieger syndrome or as a non-syndromic isolated familial trait, or as a sporadic finding. When oligodontia is associated with a syndrome there may be abnormalities of the skin, nails, eyes, ears and skeleton, while anodontia is commonly seen in severe cases of ectodermal dysplasia.^{8,9,10}

The congenital absence of teeth may be due to from physical obstruction or disruption of the dental lamina, space limitation and functional abnormalities of the dental epithelium or failure of initiation of the underlying mesenchyme.¹¹ The biologic basis for the congenital absence of permanent teeth is partially explained by the failure

of the lingual or distal proliferation of the tooth bud cells from the dental lamina. The causes of hypodontia are attributed to environmental factors such as irradiation, tumors, trauma, hormonal influences, rubella, and thalidomide or to hereditary genetic dominant factors, or to both ¹³. MSX1 and PAX9 genes play a key role in early tooth development. PAX9 is a paired domain transcription factor that plays a critical role in odontogenesis. All mutations of PAX9 identified to date have been associated with non syndromic form of tooth agenesis. ¹⁴ The characteristic dental symptoms are reduced number of teeth, a reduction in tooth size, anomalies of tooth form and delayed eruption. The absence of teeth in young patients can cause esthetic, functional and psychological problems particularly if the teeth of the anterior region are involved. ¹²

The rehabilitation of patients with multiple congenitally missing permanent teeth, i.e. Oligodontia or hypodontia is one of the ultimate challenges in dentistry. The severity of dental problems dictates the selection of the treatment plan which is best suited for improving speech, mastication as well as aesthetics. The oligodontia patient often present with small malformed crowns, underdeveloped alveolar ridge, depressed pre-maxilla and compromised soft tissue profile that prevent fixed dental prostheses or implant supported prostheses as treatment options. The fabrication of removable prostheses is often favored for achieving optimal esthetics and function. The treatment options available in removable prostheses are overlay dentures, telescopic dentures or tooth supported over denture. This also helps in the preservation of the remaining natural teeth.

In the present clinical situation, as the patient was only 15 years of age, thus an implant supported prosthesis could not be prescribed and the presence of mixed dentition did not permit fixed partial denture as a viable treatment option. Hence, an overlay denture was planned which required minimal alteration of the remaining natural teeth. Also as the patient presented an underdeveloped maxilla, poorly developed alveolar ridges and malformed and malpositioned teeth, the interarch space was increased which necessitated an increase in the vertical dimension of the patient.

An overlay denture may be defined as "A Complete Denture or Removable Denture that covers and rests on one or more removing natural teeth/roots or dental Implants". "A prostheses that covers or is partially supported by natural teeth/roots or dental implants". The advantages of Overlay Dentures are enhancement of support, stability and retention, preservation of residual alveolar ridge, preservation and maintenance of proprioception, increased masticatory efficiency and overall esthetics of the patient. The drawbacks of overlay dentures include dental caries and periodontal disease, which is overcome by proper maintenance oral hygiene.

CONCLUSION

Oligodontia should also be taken into consideration. Taking this fact to account, the dental fraternity should aim at treating the condition as early as possible and achieve both prosthetic and aesthetic functionality of teeth.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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