

Case Report

Prosthetic rehabilitation of oligodontia in a child: a case report

*Rubaba Ahmed^a, Md.Ashik Rayhan^b, Atiquzzaman Khan^c, Md. Masudur Rahman^d

- a. Assistant Professor, Department of Prosthodontics, University Dental College, Dhaka.
- b. Junior consultant(Dental), Rangpur Medical College Hospital.
- c. Assistant Professor, Department of Conservative dentistry & Endodontics, University Dental College, Dhaka.
- d. Associate Professor, Department of Prosthodontics, Bangabandhu Sheikh Mujib Medical University, Dhaka.

ARTICLE INFO

Article history:

Received 08 October 2013

Accepted 15 March 2014

Key words:

Tooth agenesis,
hypodontia,
oligodontia,
prosthetic rehabilitation.

Abstract

Oligodontia is a developmental dental anomaly. It is either an isolated trait or part of a syndrome. Oligodontia is characterized by the congenital absence of more than six permanent teeth except the third molars. In this presented case, the treatment plan aimed at psychological, esthetic and functional rehabilitation of the patient who was suffering from oligodontia. After taking a thorough medical and dental history, clinical and radiological examination, the patient was treated with a removable partial denture in the maxillary arch, while a complete denture was made in the mandibular arch. The patient's esthetics was greatly improved and early functional rehabilitation of the patient was done.

Introduction:

The term tooth agenesis means congenital absence of tooth which may be either deciduous or permanent. A tooth is defined to be congenitally missing if it has not erupted in the oral cavity and also is not visible in the radiograph¹.

Both environmental and genetic factors can cause failure of tooth development^{1,4}. The environmental factors may include trauma to

dental region, surgical procedures on jaws, chemotherapy and radiotherapy^{1,2}. Children treated for malignancy at tooth developing ages show a high frequency of missing tooth. Irradiation produces more severe effects than

chemotherapy¹. Congenitally missing teeth have been reported in children whose mother had used thalidomide during pregnancy⁷. Scientists all over the world have identified several genes which when defective cause congenitally missing teeth³. The genetic factors may be dominant or recessive. It is evident that both hypodontia and oligodontia are genetically heterogeneous traits. Mutations of two genes

**Address of Corresponding:*

Dr. Rubaba Ahmed,

Assistant Professor, Department of Prosthodontics,
University Dental College, Dhaka.

Telephone: 01727444923

E-mail address: rubabaahmed@yahoo.com

MSX1 and PAX9 have been identified in families with dominant oligodontia^{1,4,7}.

The frequency of missing teeth follows a common pattern². Most common are third molars, second premolars and maxillary lateral incisors. Most rarely missing teeth are maxillary central incisors, mandibular lateral incisors, all canines, first premolars and first molars. Shapes and position of existing teeth also may be abnormal in association with missing teeth. The features often seen include peg- shaped upper lateral incisors, taurodontism and malpositions^{2,4}.

Many terms appear in the literature to describe the phenomenon of tooth agenesis in general, such as: hypodontia, oligodontia, anodontia, aplasia of teeth, congenitally missing teeth, agenesis of teeth. The term hypodontia is used in a narrow sense when the number of missing teeth is one or a few. Oligodontia is defined as missing a large number of teeth, excluding the third molars. Anodontia is an extreme case; denoting complete absence of teeth⁵. Hypodontia and oligodontia are again classified as: 1.Isolated nonsyndromic hypodontia, 2.Syndromic hypodontia, 3.Nonsyndromic oligodontia and 4.Syndromic oligodontia.¹ Oligodontia and hypodontia have similar associated anomalies with a tendency toward delayed tooth formation, reduced size of teeth and taurodontism. Hypodontia is the mildest and most common phenotype without any systemic disorders. Prevalence of hypodontia in primary dentition varies from 0.4% to 0.9% and in permanent dentition the range is 3.5% to 6.6%^{5,6}. Prevalence of hypodontia is slightly higher in female than male. Children with hypodontia in the primary dentition nearly always show hypodontia of the successors. Hypodontia in

primary dentition may not be clinically significant, but in the permanent dentition it demands attention. The most common missing teeth is maxillary lateral incisor which hampers the esthetics of child. The child may feel socially embarrassed to talk and smile. He or she may be affected psychologically.

Oligodontia has a prevalence of 0.3 % of the population in the permanent dentition^{5,6}. There is no difference in the frequency of oligodontia between male and female. Those children who have several permanent teeth missing usually have difficulty in speech and mastication. Also these children show an overclosed profile with decreased lower facial height and increased oral commissures which give the impression of an older appearance. Because of their affected speech and unaesthetic appearance they feel embarrassed to socially interact like other normal children. So it is obvious that these children suffer from psychological, esthetic and functional problems. Thus early diagnosis and treatment of these patients is important^{3,7}. But there is absence of awareness among the parents that prosthetic rehabilitation is possible for such patients. Again, difficulty in management of the child for executing the necessary procedures in the mouth and due to belief that the treatment cannot be successful or the child will not use dental prosthesis have created reluctance among dental surgeons in treating this type of young patients.

Treatment of patients with oligodontia generally requires a multidisciplinary approach. Some patients may require prerestorative orthodontics. Treatment options may be: restoration with a removable partial denture, conventional fixed partial denture, implant retained prosthesis,

adhesive restorative techniques, combination of

Case History:

Rabeya Akhter, a 10 year old girl came to the dept. of Prosthodontics, BSMMU with the complain of aesthetic problem, difficulty in mastication and speech. Her medical history was non-contributory. She was of average health and was not medically compromised. She could talk but her pronunciations were not clear. So she was psychologically depressed. Because she had only two teeth present in her oral cavity, she felt socially embarrassed. Her family history revealed that no other member suffered from congenitally missing teeth. Also, her parents mentioned that, she had the usual number of deciduous teeth. But after physiological

these therapies or over denture.

shedding of the deciduous teeth no eruption of permanent teeth had occurred. On extra-oral examination, it was found that the vertical dimension of the lower third of the face was reduced. Thus, she had the appearance of an elderly looking person(Fig.1a,1b & 1c). Intra-oral examination revealed on the upper jaw only the first permanent molars on both right and left side. The residual alveolar ridge was quite normal in height and thickness in the maxilla. In case of the mandible, the residual alveolar ridge was moderately resorbed. But no sharp ridge or flabby ridge was present. The remaining features of the oral cavity were normal.

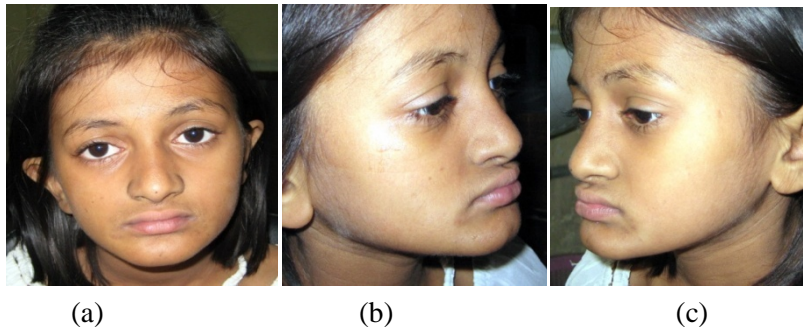


Figure1: Front(a), right(b) and left(c) profile of the patient before insertion of prostheses.

Orthopantomograph revealed total absence of permanent series of teeth in mandible and maxilla except the two first permanent molars in the maxilla. Clinically and radiologically it was

A suitable upper and lower stock tray was selected to make the preliminary impression in alginate. Preliminary models were prepared from the impressions with ordinary plaster and two custom impression trays (Fig.2) were fabricated on the models with auto-polymerizing

diagnosed as a case of non-syndromic oligodontia.

The treatment plan consisted of a removable partial denture in the upper jaw and a removable complete denture in the lower jaw.

acrylic resin. Border-molding of the custom trays were done with stick variety low fusing compound and final impression was taken with zinc-oxide eugenol paste impression material. Type-IV Dental stone was poured to make the final casts (Fig.3).

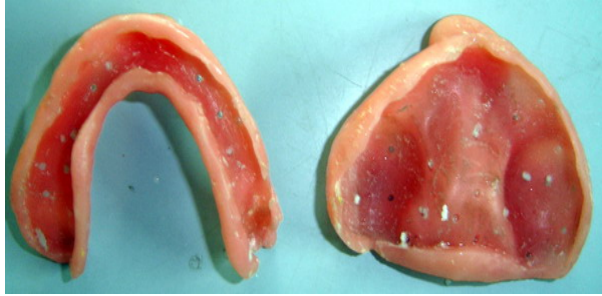


Fig.2: Custom impression trays

Fig.3:

Final casts made from final impression

Temporary denture bases with occlusal rims were prepared. Jaw registration was obtained with the occlusal rims and articulation was done (Fig.4a &4b). Artificial acrylic teeth were aligned on the articulated wax rims and a bilateral balanced occlusion was developed on a semi adjustable anatomical articulator. Maxillary and mandibular trial denture bases were tried in the patient's mouth and vertical dimension at occlusion was verified.

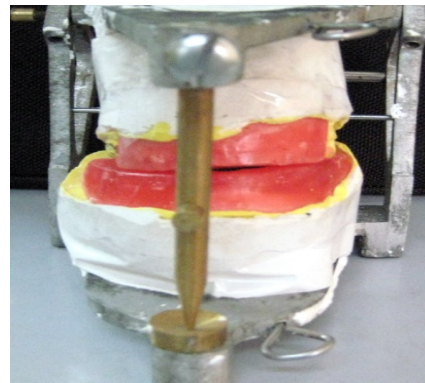
After the approval of the trial denture bases by the patient and relatives, the waxed dentures were processed in heat-cured polymethyl-methacrylate resin. The fabricated prostheses were finished and polished. The finished dentures were inserted in the patient's mouth and the patient and parents were instructed regarding the proper maintenance of oral tissues and prosthesis.

The patient was advised to come 24 hours follow-up schedule for adjustments. The patient

was also advised for long-term follow-up for the modification and/or replacement of the prostheses.



(a)



(b)

Fig.4: Jaw Relation Registration at intra-orally(a), and at articulator (b)



Fig.5: Processing for curing of the Dentures .

The facial photos with dentures in place showed improved harmony of facial appearance (Fig.7 & 8). Speech and masticatory functions of the patient were also improved.



Figure 6: Fabricated prostheses, intra-oral view(a), pre-treatment extra-oral view (b) post-treatment extra-oral view (c).

Discussion:

Agensis of one or more tooth is one of the most common of human developmental anomalies. The term oligodontia refers to congenital absence of many but not all teeth. Whereas hypodontia implies the absence of only a few teeth⁷. It is important to determine whether oligodontia is related to a syndrome or not. Patients with oligodontia as a part of syndrome may have abnormalities in other parts of the body such as skin, ears, eyes and skeleton^{1,3}. The patient in the present case had no such problems associated to these symptoms. It was evident from this case report that a patient with congenitally missing teeth suffers from esthetics, phonetic and nutritional problems^{3,7}. All these problems were greatly reduced in this patient by making the denture prostheses. The denture prostheses provided satisfactory esthetics and functional results. So early prosthetic treatment should be encouraged to improve appearance, masticatory function, speech and development of positive self-image. Also, as the age group of these types of patients is the growing stage, the removal type of prosthesis is appropriate for them because it does not impair the growth of jaws⁸. Also there should be development of awareness and assurance among the affected parents that conventional denture prosthesis can

enable their child to enjoy a relatively normal life.

Conclusion: There are good possibilities to help patients with dental anomalies by conventional prosthodontic techniques. Dental practitioners should keep in mind that conventional prosthetic treatment of such patients can be easily accomplished in a normally equipped dental office.

References:

1. Arte S, Pirinen S. Hypodontia. Orphanet Encyclopedia. Creation date: December 2003[Update; May 2004] Available from: www.orpha.net/data/patho/GB/uk-hypodontia.pdf
2. Cawson RA, Odell EW. *Cawsons Essentials of Oral Pathology And Oral Medicine*. 7th edition UK: Churchill Livingstone;Publishing 2002.
3. Akkaya N, Kiremitci A, Kansu O. Treatment of a Patient With Oligodontia: A Case Report. *J Contemp Dent Pract*. 2008 March; 9(3): pp 121-127.
4. Dental Genetics Group. Teeth and dentition. Available from: www.helsinki.fi/science/dentgen/bg.html [Access date: June 6 2009]

5. McDonald RE, Avery DR, Hartsfield JK Jr. Acquired and Developmental Disturbances of the Teeth and Associated Oral Structures. McDonald RE, Avery DR. Dentistry for the Child and Adolescent 7th edition India: Mosby; 2000. pp105-150.
6. Winter GB. Anomalies of tooth formation and eruption. Welbury RR, Editor. Pediatric Dentistry The United States: Oxford University Press: 1997. pp255-275.
7. Xiangyi He, Weina Shu, Yanli Kang, Zhiqiang Li, Jing Zhang, Kirsti Kari et al. Esthetic and Functional Rehabilitation of a Patient with Nonsyndromic Oligodontia: A Case Report from China. J Esthet Restore Dent. 2007; 19(3): pp137-143.
8. Jain V, Parkash H. Prosthodontic Rehabilitation for Ectodermal Dysplasia Patients. J Indian Pedo Prev Dent. 2000 June; 18(2): pp54-58.