

## Management of severe partial hypodontia: case report

Angela Scarparo Caldo-Teixeira\* / Regina Maria Puppini-Rontani\*\*

*Hypodontia is characterized by partial or total congenital missing of one or more teeth, on one or both dentitions. Heredity is the main etiological factor and the principal clinical features are reduction on number, size and form of teeth, and late eruption. Removable partial prosthesis, fixed prosthesis, overdentures and adhesive prosthesis are alternative treatments, and the indication is type dependent. The aim of this study was to describe the clinical case of an eleven-year-old child with eight missing permanent teeth of idiopathic etiology. The patient had facial and skeletal symmetry, normal development and was not related to any syndrome. Clinical characteristics: permanent teeth with good periodontal conditions (16, 12, 11, 21, 22, 26, 36, 31, 42, 46), primary teeth (53, 63, 64, 73, 83); overbite and microdontia on teeth 12 and 22. The treatment plan was done initially by documenting of the case for teeth analysis (study casting models, periapicals and panoramic x-rays, and photographs), and followed by the exodontics of teeth 73 and 83. A removable appliance in autocured acrylic resin, using teeth in acrylic for maintenance of functional space and occlusion was planned and carried out. An anterior track for vertical dimension gain was used because of his accentuated overbite. The patient will be monitored until the end of the craniofacial growth, when it will be again evaluated and forwarded for the final oral rehabilitation. Hypodontia diagnosis and management should be performed as early as possible not to interfere with the craniofacial development of the child.*

J Clin Pediatr Dent 27(2): 133-136, 2003

### INTRODUCTION

**H**ypodontia, which may be synonymous to anodontia, congenital absence, oligodontia or agenesis, occurs when one or more teeth bud stops forming from the dental blade. Severe hypodontia is used as a synonym of oligodontia, that means, partial edentulous arcade in which the missing teeth can be either primary and/or permanent. It is considered a severe condition due to the esthetic-functional involvement caused by the lack of multiple teeth.<sup>1,2</sup>

Its occurrence may be isolated and/or associated with specific syndromes or severe systematic disorders, like the ectodermal dysplasia.<sup>3</sup>

The occurrence of hypodontia in the permanent dentition is relatively normal, showing prevalence of

3.5% to 6.5% in the majority of the population. However, the absence of third molars is not considered hypodontia. In the deciduous dentition the hypodontia prevalence is lower, approximately 1%, not considering the gender.<sup>1,2,4-6</sup>

Although it shows low prevalence in the deciduous dentition, there are related cases, and its occurrence would result in fewer consequences for the deciduous dentition. Therefore, considering the permanent dentition, the occlusal alteration in more than 50% of the cases is observed.<sup>5,7</sup>

Severe hypodontia is frequently associated with delay in development and a relative lack of alveolar growth resulting in an increased available space. The facial appearance may mimic that of the edentulous person, with mandibular protrusion and lip eversion on occlusion.<sup>2</sup>

The clinical signs are represented by the reduction in the number, size and shape of the teeth and/or delayed eruption.<sup>1,8</sup>

It is important to establish the differential diagnosis between the isolated presence of the hypodontia and its relations with syndromes, for an effective treatment, prognosis and genetic advisement.<sup>3</sup>

The objective of this paper is to show the clinical case of a child with absence of 8 permanent teeth, of idiopathic etiology, without a history of hypodontia in the family, classified by Hobkirk and Brook 1980, as severe partial hypodontia.

\* Angela Scarparo Caldo-Teixeira, DDS, Pediatric Dentistry Specialist, Pre-Doctoral in Dental Materials at Piracicaba Dental School, University of Campinas, São Paulo, Brazil.

\*\* Regina Maria Puppini-Rontani DDS, MS, PhD, Professor of Pediatric Dentistry Department at Piracicaba Dental School, University of Campinas, São Paulo, Brazil.

Send all correspondence to Dr Regina M Puppini-Rontani, Departamento de Odontologia Infantil FOP/UNICAMP, Av Limeira 901. 13414-900 – Piracicaba SP – Brazil.

Voice: 55-019-34125286

Fax: 55-019-3412 5218

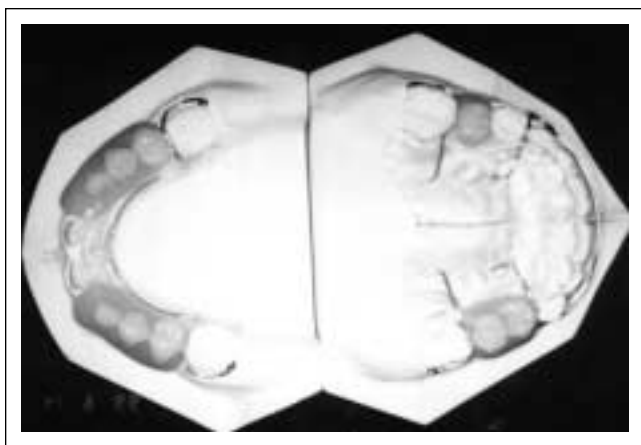
E-mail: rmpuppini@fop.unicamp.br



**Figure 1.** Frontal panoramic radiograph showing the absence of 8 permanent teeth, excluding the third molars.



**Figure 2.** Frontal view of the patient in occlusion (initial photograph).



**Figure 3.** Appliances made in the stone casts (upper and lower).



**Figure 4.** Frontal view of the patient with orthodontic appliance (upper and lower).

### CLINICAL CASE

A male patient, 11 years old, went to the Pediatric Dentistry Clinic of Piracicaba Dental School - UNICAMP, reporting delay in the eruption of his permanent teeth. According to his mother there are no other similar cases in the family. Checking the family history, it was known that his sister had extra teeth and the brother had complete deciduous dentition and normal occlusion. During the case history it was not found any evidence of alterations in skin, hair, eyes and ears, that were considered normal, excluding the possibility of this anomaly be associated to the presence of any syndrome related to the absence of teeth.

The extra-oral exam showed the presence of facial and skeletal symmetry. The presence of 10 permanent teeth, in good periodontal condition which are (16, 12, 11, 21, 22, 26, 36, 31, 42, 46), and the teeth 12 and 22 showed microdontia it was registered in the intra-oral exam. It was also noticed the presence of 5 primary teeth (53, 63, 64, 73, 83); in relation to the occlusion it was registered an accentuated overbite, and the patient did not show any temporomandibular disorders. (Figures 1, 2, 3)

In the panoramic radiograph the congenital absence of 8 permanent teeth can be seen, excluding third molars, as well as the resorption of deciduous teeth (Figure 4). The diagnosis was given as severe partial hypodontia, a term considered the most appropriate for this clinical case because of the absence of more than 6 teeth, according to Hobkirk and Brook. Because of the data collected during the case history, the etiology was considered idiopathic and the prognosis favorable.

The treatment plan was done initially by documenting the case for teeth analysis (study casting models, periapicals and panoramic radiographs, and photographs), and so extraction of teeth 73 and 83 were performed. A removable appliance in autocured acrylic resin, using teeth in acrylic for maintenance of functional space and occlusion was planned and carried out. An anterior track for vertical dimension gain was used because of his accentuated overbite. It was also evaluated the aspect of the prevention of dental cavity and periodontal disease in order to keep the oral health. Pit and fissures sealants and topical fluoride were applied.

## DISCUSSION

The knowledge of odontogenesis is fundamental for the understanding of growth and developmental disorders that affect the teeth. Many of those disorders follow hereditary patterns, while others are congenital.<sup>9</sup> In the clinical case presented here, during the case history the mother related the absence of other similar cases in the family. The sister showed extra teeth and his brother a complete deciduous dentition and normal occlusion, therefore disregarding the possibility of heredity.

Among the clinical findings related to hypodontia, the following are related: the reduction in number of teeth, dental deformities and delayed eruption associated to occlusal alterations.<sup>1</sup> The patient showed microdontia of teeth 12 and 22 and delay in the eruption of teeth 33 and 43. After evaluating the occlusal intermaxillary relation it was determined that the patient had an overbite without the transversal alterations.

The etiology of this anomaly is generally hereditary, although, according to the report of the mother there are not any other similar cases in the family. The presence of environmental factors was considered a possible etiology of this anomaly, that according to Tsai, Chiou and Tseng, in 1998, cannot be ignored, as well as: genetic mutation, glandular dysfunction (specially hypothyroidism) measles and/or the use of thalidomide during pregnancy. But these factors were also absent during the anamnesis.

Another condition often found, in which occurs partial or total hypodontia involving the deciduous and permanent dentition, is the ectodermal dysplasia hereditary disorder that has a preference for the male gender. The ectodermic derivation like hair, the teeth and the sudoriferous glands show no development or are not efficient in that condition.<sup>9</sup>

However, the major problem in the identification of the syndrome in a patient that has the anomaly is related to the diagnosis, being this one essential for an effective treatment, prognosis and genetic advisement. Because of that, the differentiation between isolated hypodontia and the one related to a syndrome is a pre-requisite for a successful treatment.<sup>3</sup>

Moreover, there is a diversity of opinions concerning the etiology, probably due to the existence of a way of transmission with variable expression.<sup>4,10</sup>

Considering all data obtained in this report, the probable etiology was characterized as idiopathic, that is, a case of isolated hypodontia.

The prevalence of anomalies such as hypodontia is low, and it is found in the permanent dentition in 3.5% to 6.5% of the majority of the population, excluding third molars, and in the deciduous dentition the percentage is approximately 1%, with no gender preference; and in the cases of severe partial hypodontia, the percentage is even lower, 0.3%.<sup>1,2,4,5</sup>

Due to the low prevalence in the population it is normal to notice the low importance that it is given to

its presence, because even though those anomalies occur in one out of 100 children, its consequence for the deciduous dentition is lesser. It is known that its effect will be remarkable in the permanent succedaneous teeth and in the occlusal development in more than 50% of these cases.<sup>5,7</sup>

Therefore, knowing about the consequences of its hypodontia, the main objective of the treatment is to replace the absent teeth, to improve the esthetic appearance, the mastication efficiency and the diction, that is, to rehabilitate the patient to his functions and bucco-dental esthetics, during the period of occlusal development. For that reason, depending on the age of the patient, the esthetic deficiency may cause severe psycho-social disorder.

Therefore, patients with dental anomalies associated to hypodontia, such as that of the teeth conical in shape, need prior restorations before the prosthesis treatment. Its usage shows difficulties, and an adequate course of treatment must be very well executed with the cooperation of professionals specialized in various areas such as: endodontists, prosthodontists, orthodontists and speech therapists.

The rehabilitation previously established produces better results when performed in teenager patients, since at that age the patient becomes more interested in his/her own state of dental health related to buccal hygiene. Young patients must be seen regularly and must have very intense control of buccal hygiene, periodontal health, presence of decay, and the way of eruption of permanent teeth must be monitored.

Different methods of treatment may be used for patients with partial hypodontia, however, the course of treatment must vary according to the severity of the anomaly, so that the results will be most satisfactory.

Due to the clinical signs shown in the patient and the establishment of the diagnosis, a removable appliance installation made of chemically activated resin acrylic was chosen. This appliance teeth retention was made of 0.7mm orthodontic wires, besides an anterior track, in acrylic resin, for gaining of vertical dimension, because the patient showed accentuated overbite.

After the exodontics of teeth 73 and 83 were performed, the permanent superior and inferior molars were sealed. The placement of orthodontic appliances increase plaque retention and consequently the caries risk for the patient.

The removable appliance was placed, the occlusion was adjusted using carbon paper for articulation. The patient was monitored monthly, following the occlusion development. The adjustments and changes required for the removable appliance, will be made until the end of the craniofacial growth, when it will be again evaluated and forwarded for the final oral rehabilitation.

Other methods of treatment have also been used for the rehabilitation of patients with hypodontia, but the treatment choice depends on the disorder presented.

Among the various types of treatment available, total prosthesis is the treatment most used in cases of extensive caries lesions or poor periodontal support in cases where other types of treatment have failed. The results have been satisfactory, but they may put an excessive weight on the tissues. Removable partial prosthesis has had great success because it enables the decrease of small spaces between teeth.<sup>2,11</sup> The anatomy of teeth in the cases of hypodontia is normally unfavorable for the placement of a conventional fixed appliance due to its unsatisfactory anatomy. In this case, the construction of crowns to help support the removable partial prosthesis shows excellent results.

Another recourse that can be used is the fixed partial prosthesis, but only when the teeth have a relatively normal anatomy and good periodontal support it can show excellent results. But the teeth must be prepared carefully in young patients, due to the large volume of pulp chamber. "Overdenture" is considered a way of producing an adequate treatment in the cases of hypodontia, they bring about the esthetic aspect, while the remaining teeth are used as additional support. It could be specially used in young patients from an early age, while the development of the occlusion is monitored, giving a better appearance and minimizing more severe psychological disorders.

The orthodontic treatment may be used to aid in the correction of malocclusion, eliminating small spaces, therefore creating a group of teeth that gives support and retention to the removable partial prosthesis. In severe situations, specially in the cases of excessive interocclusal distance, the surgical repositioning of teeth in the dental arch may provide an alternative for "overdentures" and a more satisfactory form of treatment.

It may be observed by the planning and execution of the treatment that the removable partial prosthesis is extremely viable and indicated to aid in the treatment of patients with severe partial hypodontia, because they are

capable of reestablishing the vertical dimension, and getting a great level of occlusion and position of the teeth. They also proportionate a simple method that facilitates the rehabilitation of the patient, as well as easing the monitoring of the oral health, being essential in evaluating the attitude of the patient facing the responsibility for his/her own maintenance and preparing the patient during the growth phase for the final treatment.<sup>2</sup>

### CONCLUSION

The diagnosis and monitoring of the hypodontia must start as early as possible so it does not interfere with the craniofacial growth of the child.

### REFERENCES

1. Tsai PF, *et al.* Oligodontia—a case report. *Quintessence Int* 29: 191-3, 1998.
2. Hobkirk, JA, Brook AH. The management of patients with severe hypodontia. *J Oral Rehab* 7: 289-98, 1980.
3. Schalk-Van Der Weide Y, *et al.* Symptomatology of patients with oligodontia. *J Oral Rehab* 21: 247-261, 1994.
4. Brook AH, Ekanayake FDS. The etiology of Oligodontia: a family history. *J Dent Child* 32-35, 1980.
5. Koch G, Noren J, Rasmussen, P. Distúrbios no desenvolvimento do dente e na erupção. In: *Odontopediatria: uma abordagem clínica*. 2 ed., São Paulo: Ed. Santos, p 250-74, 1995.
6. Järvinen S, Lehtinen L. Supernumerary and congenitally missing primary teeth in Finnish children: an epidemiologic study. *Acta Odontol Scand* 39: 83-86, 1981.
7. Gellin ME. The distribution of anomalies of primary anterior teeth and their effect on the permanent successors. *Dental Clin North A* 28: 69-80, 1984.
8. Newman GV, *et al.* Report of four familial cases with congenitally missing mandibular incisors. *Am J Orthod Dentofacial Orthop* 114: 195-207, 1998.
9. Toledo OA. Crescimento e Desenvolvimento. *Noções de Interesse Odontopediátrico*. In: *Odontopediatria: Fundamentos para a prática clínica*. 2a edição. São Paulo, Ed Premier pp, 17-36, 1998.
10. Arya BS, Savara BS. Familial partial anodontia: report of a case. *J Dent Child* 41: 47-54, 1974.
11. Wistanley RB. Prosthodontic treatment of patients with hypodontia. *J Prosth. Dent* 52: 687-694, 1984.