

Case Report

Oligodontia: challenges in dental rehabilitation

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Abstract Oligodontia, although rare, may have significant impact on the quality of life of those affected with it. Provision of restorative treatment for these patients can be very challenging and demanding for clinicians, especially during the active growth phase. Nevertheless, the dental needs of these patients are real and should be addressed appropriately. The present case report described a restorative rehabilitative plan and execution of different restorative treatment modalities in a 14-year-old patient with oligodontia. The challenges faced in the provision of dental care were highlighted. The treatment outcome showed a positive psychological impact on the well-being of the patient based on parental observations.

Keywords: Hypodontia, oligodontia, missing teeth, psychological impact, dental rehabilitation.

Introduction

Oligodontia is a developmental anomaly characterised by congenital absence of more than six permanent teeth excluding the third molars (Gorlin *et al.*, 2001). Compared with the prevalence of hypodontia, the occurrence of oligodontia is relatively rare which about 0.14-0.30% in Caucasian population (Dhanrajani, 2002). Oligodontia can either occur in isolation/non-syndromic or as part of a syndrome and is commonly found in association with ectodermal abnormalities (Bailleul-Forestier *et al.*, 2008). Cases of oligodontia with familial tendency have also been reported. Ongoing researches on the genetic basis of tooth agenesis have revealed involvement of some specific genes such as the MSX1, PAX9, AXIN2, SHH, PITX2, IRF6 and P63 (Matalova *et al.*, 2008; Cobourne, 2007). However, this list of genes is no means exhaustive and will continue to expand with improvement of our understanding towards this complex developmental process.

Besides missing teeth, oligodontia also brings about significant psychological, aesthetic, and functional consequences in

those affected with it (Locker *et al.*, 2010). Thus, early diagnosis and treatment of these patients are necessary. This report described a restorative rehabilitative treatment in a patient with oligodontia and the challenges encountered.

Case report

A 14-year-old Chinese boy was brought by his mother to the Paediatric Dental Clinic at the Faculty of Dentistry, National University of Malaysia with a complaint of poor dental aesthetics. His mother claimed that he has low self-esteem and not socialising well with other people. He was diagnosed to have SHORT syndrome at birth. SHORT refers to a syndrome associating with short stature (S), hyperextensibility of joints or hernia (inguinal) or both (H), ocular depression (O), Rieger anomaly (R), and teething delay (T). However, due to his normal growth and intellectual developments in later years, it was thought that he might have a variant of ectodermal dysplasia and not SHORT syndrome as noted earlier. Intraoral examination revealed patient is in his mixed dentition stage with presence of ten permanent teeth and retained seven of his

primary teeth. The permanent teeth were generally microdontic and conical in shape with wide spacing between some of them (Figure 1). The maxilla appeared to be retruded in a class III skeletal profile. Dental panoramic radiograph showed all the teeth have erupted with short roots and obliterated canals (Figure 2).

When he was nine years old, a pair of removable partial denture was constructed but he had problem adapting to it. After considering a few treatment options such as a new pair of partial denture or an overdenture or orthodontic alignment of teeth or mini implants, an interim restorative oral rehabilitative plan that involves minimal tooth preparation and that which doesn't compromise the stability and vitality of the teeth present was undertaken. It is believed that the proposed treatment will help in improving his aesthetics and functional needs until his growth ceases before a more complex treatment option can be considered. Stone casts of the upper and lower dental arches were obtained and a Kesling set-up was made on it by reshaping the microdontic anterior teeth to their appropriate size and dimensions using composite resin (Figure 3). Thereafter, transparent thermoformed templates were constructed using 1.0-mm thickness copolyester discs as described in the literature (Figure 4) (Sockalingam, 2011). These templates were used as crown formers to reconstruct the microdontic anterior teeth. Prior to this, stainless steel crowns were placed over the deciduous molars in order to provide protective coverage and at the same time to increase the occlusal vertical dimension. The crowns helped to increase the anterior occlusal vertical height by 2.5 mm. This was necessary because the patient's lower edentulous region is more anteriorly placed and the lower canines were in reverse overjet in relation to the upper teeth. Besides that, the increased in the anterior vertical dimension was also necessary to create adequate spaces for the placement of composite pontic of the upper left permanent lateral incisor and modifications of the upper right permanent central incisor and permanent canine.

The rehabilitation of the upper anterior region was undertaken in few steps in a

single visit. The upper left permanent central incisor, left permanent canine and missing left permanent lateral incisor were reconstructed as a single unit with composite resin using the prepared prefabricated transparent thermoformed template. On the right side, the upper permanent central incisor, permanent canine and primary canine were modified in their clinical crown dimensions as individual units with composite resin using the prepared template. The modifications of the upper permanent canine and permanent incisor compensated for the missing right permanent lateral incisor.

The rehabilitation of the lower arch was carried by modification of the dimensions of the lower anterior teeth by grinding of the teeth and adhesion of composite resin. The pointed tip of the lower right permanent canine was grinded with a diamond bur and polished with finishing discs. The mesio-distal dimension of the tooth was increased using composite resin. The similar steps were also repeated on the lower left permanent canine. As for the lower left permanent incisor, modification of the tooth angulation and mesio-distal dimension were carried out using composite resin. Subsequently, lingual tooth preparations were carried out on the modified teeth for acceptance of the metal wings of the Maryland bridge later. An impression of the lower arch was made with a polyether impression material (Impregum™) using a customized tray. A Maryland Bridge with three pontics and wings on the permanent right canine, left permanent lateral incisor and left permanent canine was constructed in a laboratory and cemented to the prepared teeth using Panavia™ adhesive cement (Figure 5).

The patient was reviewed after one month, six months and a year after treatment completed. Oral hygiene care and functionality of restorations placed were monitored. The outcome of the treatment undertaken for this patient showed a positive impact on the patient's well-being. According to his mother, the patient was able to socialise better with his friends and his self-confidence has improved significantly.



Fig. 1 Pre-treatment intraoral view.



Fig. 2 Dental panoramic radiograph of oligodontia.



Fig. 3 Kesling set-up of the upper microdontic anterior teeth.

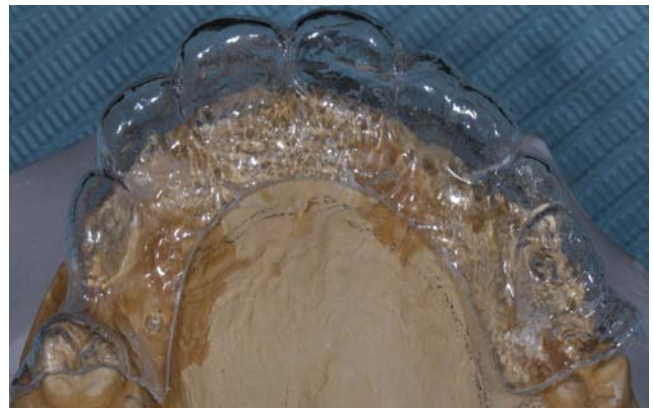


Fig. 4 Transparent thermoformed template of the upper teeth.



Fig. 5 Post-treatment intraoral a year after treatment view.

Discussion

Children and adolescents with oligodontia experienced greater impact on quality of life than more common conditions such as dental decay and malocclusions (Locker *et al.*, 2010). Increasing emphasis and demand of aesthetics as well as active lifestyle in the society make management of oligodontia is so important. Management of such severe cases ideally needs multidisciplinary dental care and in some cases surgical intervention and implant placement are often considered (Bural *et al.*, 2012; Chang, 2006; Nunn *et al.*, 2003). However, there is a need to delay the definitive treatment plan until the stabilisation of growth phase is achieved. Therefore, an interim treatment protocol is necessary and important to improve their appearance and self-esteem as well as the oral function until a complex treatment needs can be undertaken.

Conventional removable prosthesis will usually be the first line of the possible treatment options considered due to its feasibility and minimal cost. However, children and adolescents usually have problem adapting to it and may developed oral discomfort, similar to that experienced by the patient in the presented case. Orthodontic treatment to align widely splayed teeth and creating adequate sized spaces for restoration of teeth is also another possible treatment option to consider, however, this is was not possible for this patient due to the unfavourable root length of the teeth. Use of mini implants was also not favourable due their cost and inadequacy of bone at the lower edentulous region. Furthermore, the long term success of this treatment option is not well documented especially in growing children. Therefore, a combination of restorative options such as stainless steel crowns, composite build-ups using thermoformed templates and Maryland bridge proved to be a viable mean of rehabilitation in this case.

The main objectives of the treatment in the present case were to preserve all the remaining teeth and use them as pillars for interim rehabilitation of the dentitions in order to improve the patient's aesthetics,

functioning and psychological needs until the completion of his growth phase. The use of prefabricated thermoformed template helps in reducing the chair side time and also allowed better control of material utilised especially during recontouring of the lingual and palatal aspects of the microdontic teeth. Placement of stainless crowns on the posterior teeth helped to increase the patient's occlusal vertical dimension, thus allowing adequate space for reconstruction of the anterior teeth. Maryland bridge was considered in the lower anterior segment because only minimal preparation of the teeth was needed and the occlusal load that acts on bridge was negligible due to class III incisor relationship of the teeth.

Conclusion

Oligodontia provides numerous challenges in the provision of dental care, especially in relation to dental rehabilitation. Various dental parameters such as occlusal vertical dimension, availability of spaces between teeth, width of the alveolar ridge dimension and size of the teeth were some of the factors that dictate the overall treatment planning as in the presented case. These factors often complicate dental rehabilitation and need thorough assessment to ensure the success of the end results. As clinicians we should try the best to help these patients by exploring all the treatment options available to regain their functional and aesthetic use of their dentition.

In the current case, although many challenges such as inadequate spaces between teeth for restoration, inappropriate size of the teeth and their angulations were encountered, nevertheless it was possible to plan and execute an acceptable and functional dental rehabilitation. The outcome of the treatment appeared to satisfy the patient's and parental needs.

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