The role of dental therapist in the management of paediatric patients with hypodontia

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Objectives To determine the role of the dental therapist in the multidisciplinary management of paediatric patients with hypodontia. **Design** Hypodontia data collection sheet. **Subjects and methods** Fifty patient records were randomly selected from patients who had attended over the last five years to a multidisciplinary hypodontia clinic at Birmingham Dental Hospital. Data regarding the age, sex, level of cooperation, complaints, oral health, medical and dental history, genetic history, teeth present and teeth missing, occlusion, treatment carried out and treatment outstanding were collected. Subsequent statistical analysis was done with SPSS. **Results** Sixteen patients had acquired hypodontia and 34 patients had congenital hypodontia. Those with acquired hypodontia were excluded from this study. Of the 34 with congenital hypodontia 22 were male and 12 female. The mean age of these patients was 13 years (+/- 3 SD). Fifteen patients had more than six teeth missing. Teeth most commonly missing were upper lateral incisors. Sixty-eight percent had familial hypodontia and 9% had hypodontia related to a syndrome. Of the prescribed treatments, oral hygiene instruction with disclosing and dietary advice was prescribed in 16, scaling in five, fissure sealants in two, preventive resin restoration in one, study models in ten, simple conservation in 11 and extractions in 17 patients. In addition to this, all 34 patients had treatment plans for orthodontic and advanced restorative treatment. **Conclusion** All of the patients in this study were managed with a combination of orthodontic and restorative treatment. In this group of patients, it was seen that a dental therapist could have carried all of the initially prescribed treatments effectively. Disappointingly not all the patients were given dietary advice or oral hygiene instructions, which is paramount for this group of patients to maintain their dentition and facilitate long term treatment planning.

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Introduction

Dental therapists and hygienists have played a vital role in the promotion of dental health prevention of dental disease for over 45 years. The dental profession must understand their potential and appreciate their values and skills. Dental therapists can now carry out a range of procedures and with the introduction of additional duties in 2002, the therapist can also treat a wide range of high treatment need patients including the dentally anxious and medically compromised. However, it has been noted that the dental profession has not fully recognised the clinical remit and cost-effectiveness of these individuals and this group is mostly adopting a preventive role in the general dental service with an incomplete utilisation of their skills.[1,2]

Hypodontia

Hypodontia specifically describes the absence of one to six teeth excluding third molars, but is most often used when a patient has congenitally missing teeth. Anodontia refers to the total lack of one or both the dentitions whereas oligodontia

refers to more than six teeth missing excluding third molars.[3] Vanwijk and Tan have proposed a procedure for assigning values to all possible combinations of missing teeth called the tooth agenesis code (TAC), which describes the pattern of missing teeth.[4] A recent review by Lamour *et al.* on the prevalence and aetiology of hypodontia suggests its prevalence in the permanent dentition is between 2.6% and 11.3% worldwide with relatively consistent prevalence rate of 4-4.5% in the UK.[5] The prevalence of oligodontia in the Caucasian population is less than 1% and is found in higher incidence in women than men.[6] Oligodontia can occur as an isolated non-syndromic condition or as part of a syndrome such as ectodermal dysplasia. The non-syndromic or familial form of hypodontia can follow autosomal dominant, autosomal recessive or sex-linked patterns of inheritance. Recently mutations in MSX1, PAX9 & AXIN2 have been demonstrated to be associated with isolated non-syndromic oligodontia in humans.[7] In addition, congenitally missing teeth could be related to endocrine, local and environmental factors. In nonsyndromic oligodontia, there is sometimes asymmetry of agenesis between right and left sides in the maxilla and mandible.[8] Missing permanent teeth are seen in about 30-50% of patients with missing primary teeth. The mandibular second premolar and maxillary lateral incisor are the teeth most commonly missing in the Caucasian population.[5]

Multidisciplinary approach

Hypodontia or missing teeth, though uncommon, is an important anomaly of tooth eruption. It is imperative for dental clinicians to be aware of the psychosocial, functional implications of this condition and understand that the optimal management of many of these cases can be facilitated through a multidisciplinary approach; in most cases in combination with the patient's general dental practitioner.[9] As a team member the general dental practitioner should be able to diagnose and discuss the condition, reassure the patient and their family and refer the patient to the appropriate multidisciplinary clinic in complex cases. The therapist can play a very vital role in the detection, treatment and discussion of the implications of congenitally missing teeth with their families and have been proposed to act as potential referral sources to geneticists interested in the research on the cause of familial hypodontia.[10] Screening of the families helps in the early identification and treatment of these cases.

Fig. 1 Patients' complaints

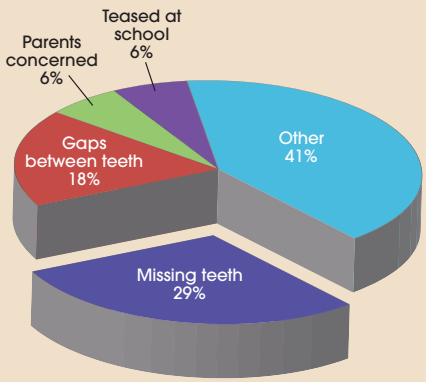
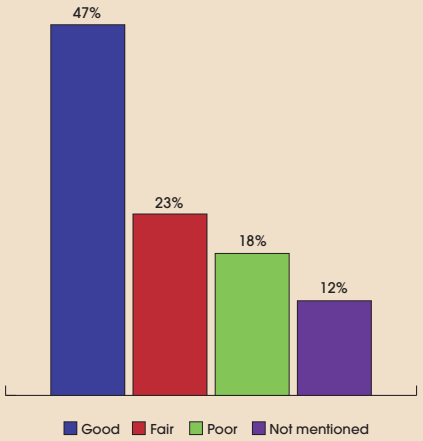


Fig. 2 Oral health of the patients



Treatment cascade

Paediatric patients with multiple missing teeth can require a significant amount of dental care through a care pathway from an early age to provide them with a long term functional dentition. The treatment of more severe cases of hypodontia generally involves the orthodontist, paediatric dentist, restorative dentist, maxillofacial surgeons and dental therapist. The treatment cascade could involve tooth movement to create or close space, implants, adhesive bridges, removable or fixed partial dentures or a combination of these. The treatment should be to improve both aesthetics and function. However, the aim of the treatment should be to target at prevention and minimise the need for extensive restorative treatment other than the replacement of missing teeth.[11]

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Accepting the importance of a multidisciplinary team for the treatment of paediatric patients with hypodontia, this investigation aimed to ascertain the types of treatment prescribed for a random group of hypodontia patients and whether those procedures could be carried out by a therapist within their clinical remit whilst accepting a gold standard that patients diagnosed with hypodontia would have at least one visit or contact with a therapist to establish a preventive regime and have records ie study models taken. The investigation was also carried out to find out if the therapist could effectively address the facilitation of the treatment of these patients. This study also aimed to propose the idea of a model care pathway for the treatment of these patients as has been suggested for the management of ectodermal dysplasia and severe hypodontia by Hobkirk *et al.*[12]

Materials and methods

A total of 50 patients were randomly selected from the patients who had attended the hypodontia clinic in the last five years at Birmingham Dental Hospital. The randomisation was achieved by numbering all of the patients from number 1 to include the last patient. A random numbers table was used as a guide to randomly select the patients.

The precompiled hypodontia clinic data collection sheet was used to record the relevant information. Case notes were used to gather data regarding age, sex,

primary complaint, patient cooperation, oral health, medical and dental history and genetic history. The teeth present in the mouth, teeth missing, teeth extracted and unerupted teeth present on the orthopantomogram were noted. Account was made of any supernumeraries and the occlusal examination. Information regarding the treatment carried out and treatment outstanding was collected. The treatment allocation data was also noted.

Out of the 50 patients, 16 patients had acquired hypodontia and were excluded from the study. Hence the study comprised of 34 patients in total with congenital hypodontia.

The data input was done on SPSS and subsequent statistical analysis was performed.

Results

Of the 34 patients included, 22 were male and 12 female. The mean age was 13 years (SD = +/-3). Twenty-three patients had familial hypodontia and three patients had hypodontia associated with syndrome of which two had ectodermal dysplasia and one suffered from Wiskcott-Aldrich syndrome. Twenty-five patients were regular dental attenders and two of the patients were only occasional attenders. Data regarding dental attendance for the other seven patients were not recorded.

Figure 1 summarises the complaints of these patients. The primary complaint for 29% of patients was missing teeth. There were other complaints for example 'teasing at school', 'gaps between teeth', 'small teeth and slow eating'. In 6% of the cases parents were concerned with the child's appearance.

Co-operation was noted to be good in 26 patients, three patients were uncooperative and it was not recorded in five patients. Figure 2 details the oral health of the patients. In 12% of the cases, the oral hygiene was not recorded at all. It can be noted that oral hygiene was noted to be inadequate in 41% of these patients.

Figure 3 shows the number of missing teeth. The most common missing teeth were upper lateral incisors followed by upper and lower third molars. Lower canines were noted to be least commonly missing in this study. Fifteen patients had more than six teeth missing.

Figure 4 indicates the prescribed treatment at initial treatment planning stages; this includes oral hygiene instruction and dietary advice, scaling and polishing, study models, fissure sealants, preventive resin restorations, simple conservation and extractions. In all cases long term treatment planning had been discussed and planned to include orthodontic and advanced restorative treatments, for example space closure, prosthetic appliances, composite additions, bridges and implants. The exact nature of this was not included in the remit of this study. Out of the 34 patients only four (11.76%) had a referral to and were seen by a therapist.

Fig. 3 Location and number of missing teeth

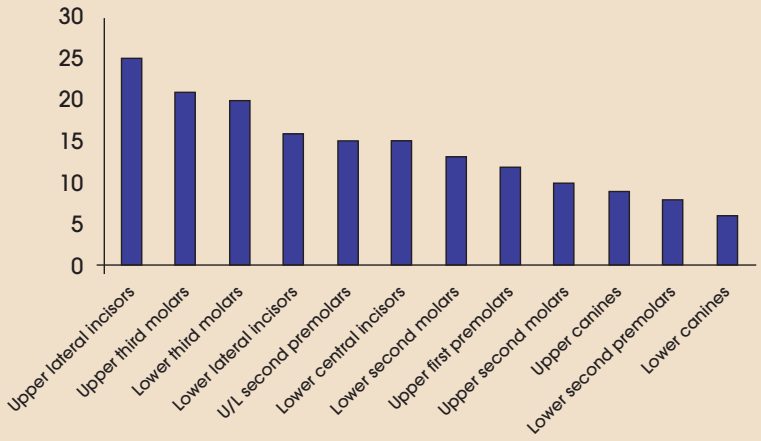
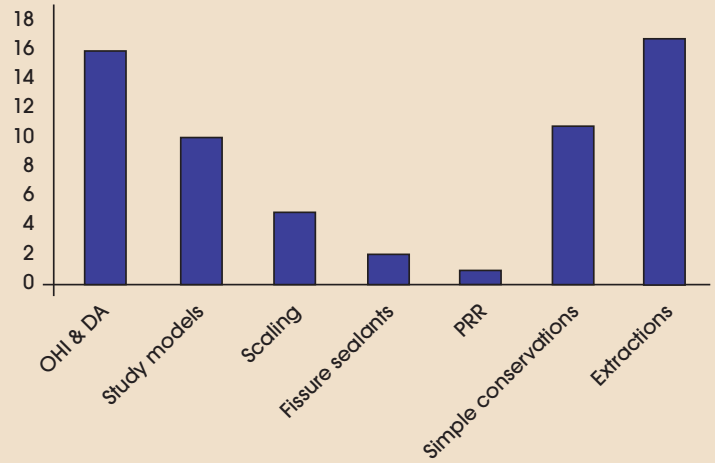


Fig. 4 Prescribed treatment for number of teeth at initial treatment planning stages (OHI: Oral health instructions; DA: Dietary advice; PRR: Preventive resin restoration)



Discussion

This study indicates that the majority of the initially prescribed treatment could be performed by a dental therapist. Disappointingly, a therapist saw only four out of the 34 patients and alarmingly from the data it appears that dietary advice and oral hygiene instruction was not given to many of the patients. This is obviously paramount for this group of patients to maintain their dentition and facilitate long term treatment planning. However, for this

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visit to the multidisciplinary clinic emphasis may have been made on treatment planning options and would be reflective of an older age group. The mean age range was 13 years for this cohort of patients. This, however, does not excuse the need to reinforce this in a vulnerable patient group such as this.

A vital role

A dental therapist has a vital role in prevention by providing dental education on a one to one basis and they can carry out a range of routine procedures such as scaling and polishing, fluoride application and fissure sealant, simple conservation, x-rays and extraction of deciduous teeth. They can also perform extended duties like taking impressions, pulp therapy treatment and preformed crowns for deciduous teeth if they have completed the appropriate training. This could help in long-term maintenance and address the long waiting times along with the psychological aspects of treatment of this group of patients.

Oral hygiene and diet

In all cases of hypodontia accessing and treating caries, periodontal stabilisation and long term support is of utmost importance for the retention of the teeth and maintenance of restorations.[11] The use of a removable prosthesis, often given as an interim prosthesis, is associated with difficulties in oral hygiene maintenance due to plaque retention, caries and periodontal disease. Hence regular oral care and good oral hygiene practice can give acceptable long-term results.[13] Teeth are required to maintain alveolar bone for possible future implant placement and hence to retain existing teeth is important. Prevention is necessary to prevent loss of potentially useful units. Patients with hypodontia may choose soft foods, avoid fruits and vegetables and the dental therapist can also play an important role in dietary advice.[10] Dental therapists can often build up a good rapport with patients and provide continuity of care thereby enabling reinforcement of good practices.

The regular involvement of the dental therapist in the multidisciplinary management of paediatric patients with hypodontia would be invaluable. The initial contact of these patients with the dental treatment starts with dietary advice and hygiene instructions, which could be carried out at first appointment with the therapist/hygienist, hopefully minimising the need for simple conservation.

Conclusion

In conclusion, this small sample demonstrates the valuable and vital role that a highly skilful dental therapist can play in the multidisciplinary management of paediatric patients with hypodontia. All of the initial treatment prescribed in this small cohort could have been carried out by a dental therapist. There is therefore value in the dental therapist being actively involved in the model care pathway and in the early management of this group of patients to assist in maintaining and stabilising the patients' existing dentition, hence ensuring that long term treatment planning and options are not compromised.

The authors would like to thank the University of Birmingham and the School of Hygiene and Therapy who supported this study carried out as part of a dissertation. Also a special reference and thanks to the medical records department and the clerical staff of the Birmingham Dental Hospital for their help in carrying out this study.

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