

# Use of Adhesive Techniques in the Management of Hypodontia

Samira K Al-Salehi\*

Professor of Restorative Dentistry, BDS, MFDS (Glasg.), FDS (Rest. Dent.) RCPS, PhD, FHEA, Director of Endodontic Programme, Dubai College of Dental Medicine, Dubai Healthcare City, Dubai, UAE

\*Corresponding author: [samira.alsalehi@dcdm.ac.ae](mailto:samira.alsalehi@dcdm.ac.ae)

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**Abstract** The treatment and management of hypodontia are complex. Traditional treatments include the provision of conventional bridgework. Such treatment modalities are destructive of remaining tooth tissue particularly as the majority of patients presenting for treatment are young adults. This case report describes a 22 year old female Caucasian patient who was treated for missing permanent teeth using conservative adhesive non destructive techniques resulting in a pleasing aesthetic outcome.

**Keywords:** Hypodontia, adhesive dentistry, dentine bonded bridgework

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## 1. Introduction

The clinical importance of variations of tooth number, size and shape is seen in many dental disciplines, particularly restorative dentistry, paediatric dentistry and orthodontics [1]. Dental treatment of patients with hypodontia requires a multidisciplinary approach [2]. Ideally, patients' dental care should be managed by a team of specialists from childhood to adulthood [3,4]. Hypodontia is the developmental absence of teeth with a prevalence of 4.6–6.3% within the permanent dentitions of Caucasian European populations [5]. It occurs predominantly in females. The prevalence amongst Asian populations has been reported to vary from as low as 2.6% to a relatively high figure of 11.2% [6]. The most commonly missing teeth are third molars, mandibular second premolars, maxillary lateral incisors and maxillary second premolars.

There are a number of options available in the treatment of hypodontia. The decision on the type of treatment depends on the individual case as well as the number of teeth missing, size of the spaces and the dimensions of the remaining teeth [7].

The various approaches for the treatment of hypodontia include conventional crown and bridgework. The drawback of such treatment is that, especially if undertaken in young patients, it can lead to devitalization of teeth in about 18% of cases [8,9]. Removable partial dentures are also an option however, the majority of young patients find this treatment unacceptable for psychological and aesthetic reasons. Implants are a popular option for the replacement of missing teeth. In hypodontia, however, bone grafting procedures and orthodontic treatment are often also required making the case more complicated [10].

The use of adhesive dentistry [11] is a conservative treatment option. If the treatment is planned carefully acceptable clinical outcomes can be achieved. This report demonstrates how good aesthetic results can be achieved with minimal destruction. This has significant benefits for young patients in the short term, but also, and more importantly, in the long term, as it preserves tooth tissue required for future possible interventions.

## 2. Case Report

A 21 year old Caucasian female patient (Figure 1) was referred from the Orthodontic to the Restorative Department in a teaching hospital. The patient initially presented to the Orthodontic Department at the age of 16. She had hypodontia and the following permanent teeth were missing

18,17,12 23,27,28  
8,47,45,41 32,37,38



Figure 1. Buccal view post Orthodontic treatment

She also exhibited an element of microdontia. The Orthodontic treatment involved expansion of the upper arch together with redistribution of spaces.

On the Restorative clinic, maxillary and mandibular impressions were made using irreversible hydrocolloid material along with a face bow registration. A mandibular registration was made with myco extra hard beauty wax and a wax up prescribed (Figure 2). Maxillary and mandibular vacuum formed matrices were fabricated from duplicate models of the wax up. The laboratory made matrices were used to provide direct composites on 13, 11, 22, 24,33, 43. Adhesive resin retained bridgework was provided for the maxillary arch (Figure 3) to replace the 12 (metal wing on the 11) and 23 (metal wing on the 24). Panavia F 2.0 resin cement (Kuraray medical INC., Japan) with opaquer was used to cement the maxillary adhesive bridgework. A dentine bonded composite bridge (Solidex, Shofu) was used to replace the 41 (retainers on the 32 and 42). The bridge was cemented with a resin cement (Caliber R Esthetic Resin Cement, Dentsply International) (Figure 4).



Figure 2. Wax up



Figure 3. Palatal view, maxillary arch



Figure 4. Buccal view post Restorative treatment

On completion of the treatment maxillary and mandibular Essix appliances were provided for night time wear to maintain tooth position (retention).

### 3. Discussion

Treating hypodontia often poses a number of challenges to the clinician and is best managed through a multidisciplinary approach.

Furthermore, due to the complexity of such cases, even when multidisciplinary care has been provided, not all treatment options are applicable. From the outset it was clear in this case that provision of implants, for example, was not an option due to the lack of space for implant units. The patient had already undergone 4 years of fixed Orthodontic treatment. Additionally, implant treatment in hypodontia can also be further complicated by the lack of bone available for implant placement. Patients often require graft procedures. Understandably, perhaps the patient was anxious to complete her dental treatment without resorting to further protracted treatment such as surgical interventions.

As well as missing permanent teeth, the patient also exhibited microdontia which makes the task of achieving good aesthetics all the more challenging. Provision of a wax up, on articulated study models, is paramount to ensure careful treatment planning. In this way the relatively small tooth proportions can be assessed carefully.

A conservative adhesive approach was planned for the patient. Direct and indirect adhesive restorations were provided. For the indirect restorations, minimal tooth preparations were made and all margins were kept in enamel. The patient's tooth structure was thus conserved and the pulp not compromised.

Two resin bonded bridges were provided in the upper arch. Provision of resin bonded bridges were deemed appropriate in this case as the spaces were single units. Care was taken not to load the pontics in excursive movements. The occlusal surface of the UL4 abutment was used to increase the surface for bonding and resist displacement forces.

An adhesive fixed bridge was provided to replace the missing lower anterior tooth. A conventional bridge would have resulted in unnecessary tooth destruction which would have compromised not only the retention of the bridge but, also resulted in loss of vitality of the lower incisors. The appearance of dentine bonded restorations is also superior to conventional metal ceramic restorations as they do not appear to cause darkening of the gingival margins [12].

Good aesthetic results were achieved using very conservative techniques. As the patient was young, it was important not to push her further up the "restorative treatment ladder". Patients are becoming increasingly more demanding with regards to their aesthetic expectations. This, however, needs to be carefully balanced against increased life expectancy. The more complex the treatment provided the more complicated the future maintenance cycle. This case illustrated a complex presentation of hypodontia which was treated with relatively simple and conservative restorative techniques.

The patient was happy with the outcome and at the same time, tooth structure was not compromised.

#### 4. Conclusions

- Careful planning of patients with hypodontia is vital and ideally requires a multidisciplinary team approach.
- Aesthetically pleasing results can be obtained with less destructive and more conservative techniques.
- The age of patients needs to be incorporated into the treatment planning process to avoid a complex cycle of future maintenance therapy.

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