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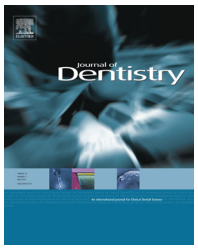

Impact of resin bonded bridgework on quality of life of patients with hypodontia

Lamyia Anweigi [a], *P. Finbarr Allen* [a,*], *Hassan Ziada* [b]

[a] *Cork Dental School & Hospital, University College Cork, Ireland*
[b] *Health Science Centre, Faculty of Dentistry, Kuwait University, Kuwait*

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ABSTRACT

Objectives: To determine the impact of hypodontia on the quality of life of adolescent and young adult patients, and, to assess the impact of restoring tooth spaces with resin bonded bridgework on quality of life of patients with hypodontia.

Methods: In a prospective study, 82 patients with a confirmed diagnosis of hypodontia participated. The primary outcome was oral health related quality of life (OHRQoL) and this was measured using the OHIP-49 prior to treatment. The pre-treatment sample was then divided into two groups: the test group ($n = 40$ patients) who had completed orthodontic treatment and had tooth spaces restored with resin bonded bridgework, and, a control group ($n = 42$ patients) who were still in the process of orthodontic treatment. All patients completed a follow-up OHIP-49, and between and within group comparisons made.

Results: The pre-treatment sample included 43 females and 39 males, age ranged from 16 to 34 years (median age 19). Forty-three patients had more than 4 congenitally missing teeth and thirty-nine had ≤4 congenitally missing teeth. There were no differences between the groups prior to treatment. For the test group, there was a significant improvement in median OHIP summary scores ($p < 0.001$) after treatment. OHIP scores deteriorated to a significant degree for control subjects ($p = 0.002$). The effect sizes for the pre–post treatment change in both groups were moderate to large.

Conclusions: Hypodontia has a significant impact on oral health related quality of life. Provision of resin bonded bridges has a positive impact on oral health related quality of life of patients with hypodontia.

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1. Introduction

Hypodontia is the developmental absence of one or more primary or secondary teeth excluding third molar teeth. Hypodontia is categorized as mild when one to three teeth are absent; moderate when four to six teeth are absent and severe when more than six teeth are absent.[1–3]

Until recently, there has been little understanding of the functional and psychosocial impact of congenital absence of teeth in patients with hypodontia. In terms of patient concerns, Hobkirk et al.[4] reported that dissatisfaction with appearance was the most frequent complaint in a retrospective analysis of 451 patients. Where oral health related quality of life was the primary outcome, Wong et al.[5] and Locker et al.[6] reported that functional limitation and emotional well-being were severely impacted by congenital absence of teeth. Their studies consisted of children aged between 11 and 14 years of age, and both used the Child Perceptions of Quality of Life questionnaire (CPQ), a validated health status measure for

* *Corresponding author at*: Cork Dental School & Hospital, Wilton, Cork, Ireland. Tel.: +353 21 4901186.
E-mail address: f.allen@ucc.ie (P. Finbarr Allen).
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children. Locker et al.[6] also reported that quality of life impacts were more frequently reported by patients with hypodontia than those with dental caries or malocclusion. This is in contrast to the findings of a study reported by Laing et al.[7] In a cross-sectional study which used the CPQ to compare impacts on quality of life of hypodontia, they included a control group of patients scheduled to have routine orthodontic treatment. They found no differences between the groups, and suggested that this was as a consequence of both groups having anterior toothspaces with which patients were unhappy. The mean age of the patients in this study was 13.6 years, and might suggest that the full impact of hypodontia may not have been apparent at this stage. It is not unusual for children of that age to have spacing between teeth, but unlike patients with congenital absence of teeth, this is likely to reduce with age. There are no reports in the literature concerning the impact of untreated congenital toothloss in late adolescence or early adulthood.

There are a number of restorative options to manage congenital absence of teeth.[8–10] Ordinarily, restorative treatment is provided following a course of orthodontic treatment designed to position abutment teeth optimally for the chosen prosthetic treatment. Removable partial dentures are mostly used prior to completion of growth, normally around 16 years of age for females and 18 years of age for males. Upon completion of growth, adhesive (resin bonded) fixed bridgework or implant retained restorations would be the treatments of choice. In the case of resin bonded bridgework, bonding surface area may be reduced in patients with hypodontia, and there are no reports of the survival rate of these restorations in this specific clinical context. Provision of implant retained restorations in patients with hypodontia is complicated by the lack of alveolar bone volume in these patients. Further research is also needed to clarify the survival rate of implants in this specific context. This treatment option is also costly, and may be beyond the financial resources of the patient of a fund provider.

The aims of this study were to determine the impact of hypodontia on the quality of life of adolescent and young adult patients with congenital absence of teeth, and, to assess the impact of restoring tooth spaces with resin bonded bridgework on quality of life of patients with hypodontia.

2. Methods

The protocol for this prospective study was approved by the Clinical Research Ethics Committee of the Cork Teaching Hospitals, and full ethical approval was subsequently granted. All patients who met the eligibility criteria for the study received information sheets, written informed consent forms, and the purpose of the study was explained verbally. All participants were assured that their future management would not be affected by their decision on whether or not to participate in the study.

Patients with a confirmed diagnosis of non-syndromic hypodontia were recruited for the study from consultation clinics at Cork University Dental School and Hospital, Ireland. The majority of patients were referred to the clinics from orthodontic departments in the public dental services and the remainder referred from other departments within the Dental School and Hospital. The primary purpose of the clinic is to direct the restorative phase of care, and review progress of orthodontic treatment.

Diagnosis was based on clinical examination and confirmed by radiographic assessment. The patient assessment procedure involved a comprehensive clinical examination and radiographs (intra or extra-oral or both), and the formulation of a combined orthodontic and restorative treatment plan. To reduce the possibility of response bias, participants were assured that their decision regarding participation in the study would not influence the outcome of their treatment. Furthermore, a research assistant not involved in patient treatment was used to collect data from patients. Two groups of patients with congenital absence of teeth were included in this study. The ''test'' group consisted of patients who were provided with resin bonded bridgework to restore missing teeth upon completion of orthodontic treatment. The ''control'' group consisted of patients who had not yet commenced or were in an early stage of orthodontic treatment and had unrestored tooth spaces due to congenital absence of permanent teeth. Details of the study profile are shown in Fig. 1.

Once the participant agreed to participate, the following demographic details were recorded on a pro-forma: age, gender, details of treatment stages, and family history. During the course of clinical examination, the number and location of missing teeth was obtained. At baseline, all participants were also asked to complete an oral health related quality of life measure, the OHIP-49, without the treating clinician in attendance. This is a validated oral health related quality of life (OHRQoL) measure previously used in clinical studies.[11,12] It consists of 49 items organized in seven sub-scales, and a Likert response format ranging from 0 (never) to 4 (very often) to questions phrased ''In the past 12 months, have you had.... because of problems with your teeth, mouth or dentures?'' Severity scores are calculated by summing the response codes across the 49 items, with higher scores indicating poorer OHRQoL. Summary scores were calculated as overall OHIP scores, and, for each of the seven domains (sub-scales). Patients were asked to complete OHIP questionnaires at baseline for both groups, and, 6 months following provision of RBBs for the test group and immediately prior to completion of orthodontic treatment for the control group.

Resin bonded bridgework for the test group patients was provided by a single operator to a standardized clinical protocol. The inclusion criteria were:

(1) Patients with edentate spans approximately one tooth unit in size bounded by sound teeth, free of caries and periodontal disease.
(2) Favourable occlusion (good occlusal plane with no tilting or over eruption into the edentulous space, no large discrepancy of space and heavy occlusion). This was assessed clinically using post-orthodontic retainers as a guide and on articulated casts.
(3) The participants should have had at least six months post-orthodontic retention.[13]

The following treatment protocol for providing RBBs was followed:

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