

The Relationship Between Missing Occlusal Units and Oral Health-Related Quality of Life in Patients with Shortened Dental Arches

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This study aimed to investigate the relationship between missing occlusal units and oral health-related quality of life (OHRQoL) in subjects with shortened dental arches (SDAs). Subjects with SDAs (N = 115) were recruited consecutively from 6 university-based prosthodontic clinics. OHRQoL was measured using the Japanese version of the Oral Health Impact Profile (OHIP-J). An increase of 1 missing occlusal unit was associated with an increase of 2.1 OHIP-J units (95% CI: 0.6–3.5, $P = .02$) in a linear regression analysis. Missing occlusal units are related to OHRQoL impairment in subjects with SDAs. *Int J Prosthodont* 2008;21:72–74.

The term shortened dental arch (SDA) was first used in 1981 by Käyser¹ to describe dentition with a loss of posterior teeth. After several clinical studies, Käyser concluded that there is sufficient adaptive capacity in patients with SDA when at least 4 occlusal units (OUs) are present (1 unit corresponds to a pair of occluding premolars, whereas a pair of occluding molars corresponds to 2 units).

Recently, the impact of oral disorders and interventions on patients' perceived oral health state and oral health-related quality of life (OHRQoL) has been increasingly recognized as an important component of

health.² Because the effects of tooth loss on OHRQoL in SDA patients are unclear, this case series investigated the association between missing OUs and OHRQoL in subjects with SDA.

Materials and Methods

This study was designed as a multicenter cross-sectional study. Six prosthodontic departments from Japanese dental schools participated. The study protocol was approved by the Ethics Committee of Tokyo Medical and Dental University. Over a period of 1 month, a total of 6,307 patients visited any 1 of the 6 clinics. Among those patients, 121 were identified as SDA subjects (Table 1). After a thorough explanation of this study, 115 subjects agreed to participate and provided written informed consent (Table 2).

To evaluate OHRQoL, the Japanese version of the Oral Health Impact Profile, OHIP-J,³ was administered to each subject. Examiners recorded the number and location of missing teeth (Table 3), and the number of missing OUs was calculated using this information. The null hypothesis was that there is no linear association between missing OUs and OHIP-J summary scores.

Visual inspection of a locally weighted scatter plot smoothing (LOWESS) curve revealed that the relationship was approximately linear (Fig 1). To assess the association between missing OUs and OHIP-J summary scores, an ordinary least squares regression was performed, taking into account the cluster sampling study design. Age was considered as a confounder for the association and was included in a second analysis.

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The ANOVA showed statistically significant main and interaction effects ($P < .05$). Thus, post hoc Tukey HSD ($\alpha < .05$) was applied and showed statistically significant differences between all materials, between all RH level means, and between all time after mixing means, with the exception of the material pairs AUX/AFF and AUX/PCP. Interaction effects are visualized in Figs 2 and 3. Only PIC and RH showed an interaction based on statistically significant mean differences at all 3 RH levels. Differences in the mean contact angles of every material were statistically significantly dependent on the time since mixing.

Discussion

Decreasing contact angles, generally observed with unset hydrophilized PVS materials as a function of the drop age, can be explained by the impact of surfactants. RH values of 50% were chosen to simulate the RH level of the ambient room, 80% to simulate the oral cavity, and 20% to simulate a very dry situation. Analyzing the initial contact angles of 1-second-old drops at 20%, 50%, and 80% RH, the PVS PIC is more hydrophilic than the polyether. In contrast to the material's main effect, the main effect of RH is not consistent but rather is based on the PIC/RH interaction. Regarding the factor "time after mixing," the differences between the contact angles were statistically significant with increased contact angles and increasing time, at least at one time point for a given material, indicating consistency. Decreased hydrophilicity with ongoing working time may be a factor that negatively influences clinical impression results.

Literature Abstract

Resin elasticity and the strengthening of all-ceramic restorations

The purpose of the study was to investigate the strengthening effect of resins with different elastic behaviors in a simulated resin-bonded all-ceramic restoration. The hypothesis was that ceramic strength enhancement is dependent on the elastic modulus of the resin cement selected. Two hundred forty porcelain disks were prepared using Vitadur-Alpha dentin porcelain powder and modeling fluid. The specimens were vacuum-fired according to the manufacturer's instructions and air abraded with 50- μ m alumina particles. One group served as the control while 3 other groups were coated with $120 \pm 20 \mu$ m of 3 different resins (Flowline, Rely-X Veneer Cement, and Clearfil APX). A profilometer was used to characterize the surface texture of the porcelain control surface. Three readings were taken across the center of each specimen. Each specimen was subjected to biaxial flexure testing. Multiple comparisons of the 3-point and biaxial group means were made by a 1-way analysis of variance and Tukey multiple range tests at $P < .05$. The biaxial flexural strength data were ranked in ascending order. A Weibull analysis was performed and 95% confidence limits were considered to be significant. The results indicated that all resins significantly increased in mean strength, and this increase was associated with the elastic modulus of the resin ($R^2 = 0.9885$). The author concludes that the hypothesis was accepted and explained that the combination of Poisson constraint and the creation of a resin-interpenetrating layer sensitive to the elastic modulus may be responsible for the strengthening mechanism.

Addison O, Marquis PM, Fleming GJP. *J Dent Res* 2007;86:519-523. **References:** 29. **Reprints:** Dr O. Addison, Biomaterials Unit, School of Dentistry, University of Birmingham, St Chad's Queensway, Birmingham B46NN, UK. E-mail: addisonobham.ac.uk—Beatrice Leung, Toronto, ON

Conclusion

To the authors' knowledge, this study has shown for the first time that the RH level can influence the hydrophilic behavior of impression materials. Contact angle analyses that account for RH will identify impression materials sensitive to RH and lead to more clinically relevant data. Until now, the term *initial hydrophilicity* has not been clearly defined. Therefore, it must be taken into consideration that the degree of initial hydrophilicity or rankings between materials may differ, depending on the frame rate of the analysis system and on the drop age from which the contact angle is taken.

Acknowledgments

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