Moistened Techniques Considered for Patients' Comfort and Operators' Ease in Dental Treatment

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Abstract

Aim: In dental treatment, to remove an instrument, such as dental mirror or to remove a dental cotton roll inserted in the gingivobuccal fold, often brings the patient discomfort or pain. To prevent these uncomfortable conditions, dental instruments or dental cotton rolls are moistened based on an empirical basis. However, there has been no research done evaluating whether discomfort is reduced by these techniques. The purpose of this study was to evaluate the effects of moistened techniques on the patients' discomfort and the operators' ease.

Materials and Methods: Thirty eight subjects without hyposalivation were studied. Two procedures were implemented. One was that a dry or moistened dental mirror was removed after exclusion of the buccal mucosa. The other was removal of a dental cotton roll from the gingivobuccal fold after either moistening it or leaving it dry. The subjects' comfort and the operators' treatment ease were evaluated on five point scales.

Results: During these procedures, the subjects' comfort was significantly increased by moistening of both the dental mirror and the cotton roll. The ease of performing both procedures was also significantly increased for operators in the moistened condition. In addition, there was a significant positive correlation between the subjects' comfort and the operators' ease.

Conclusion: When using dental instruments and removing cotton rolls, moistening increases both the subjects' comfort and operators' treatment ease.

Keywords :

moistening, technique, treatment, hyposalivation

Introduction

There are some procedures which bring patients discomfort or pain in dental treatment. One example is exclusion of the buccal mucosa by a dental mirror. Although this procedure is necessary to obtain enough treatment fields, too excessive exclusion brings the patient discomfort or pain. Moreover, when removing a dry dental mirror from

buccal mucosa, the mirror sticks to the mucosa. To remove it forcibly imparts discomfort to the patient and increases the difficulty for the operator. Another example is removing a dental cotton roll which had been inserted to the gingivobuccal fold. To remove it without moistening is very difficult because it sticks to the mucosa. To prevent these uncomfortable conditions, dental instruments and dental cotton rolls should be moistened. It is speculated that these techniques are widely implemented on an empirical basis. However, there has been no research evaluating whether

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Fig. 1 Illustration of the two procedures
 A : Exclusion of buccal mucosa using a dental mirror
 B : Removal of cotton rolls from the gingivobuccal fold.

discomfort is reduced by these techniques or not. It is also unclear whether implementation of these techniques also makes dental treatment easier for the dentist or dental hygienist. Techniques that improve patient comfort are undesirable if they cause the operator significant distress. Therefore, good techniques would improve the comfort of both patients and operators.

Saliva plays important roles in digestion, antibacterial and buffering actions, lubrication, and protection of the oral mucosa (1, 2). In hyposalivation patients, the oral mucosa is easily damaged (3), and discomfort or pain may occur. It is possible that the degree of discomfort and salivary volume are correlated. If moistening techniques are effective to even normal salivation patients, it should be implemented for hyposalivation patients as well.

The purpose of this study was to evaluate the effects of moistening techniques on the process of dental treatment. This study was carried out to clarify three points: (i) whether the salivary volume affects the level of discomfort in two dental procedures; (ii) whether a moistened/dry dental mirror or dental cotton roll affects the level of subjects' discomfort; (iii) whether these two techniques are useful for both patients and dentists or dental hygienists during dental treatment.

Materials and Methods

Subjects

The subjects were 38 students (one man, 37 women, 20.9 $\pm$ 0.2 years old) whose salivary volume was more than 2 g

in a Saxon test. They were third year students of the Department of Oral Health and Welfare, Faculty of Dentistry Niigata University. This study was approved by the Ethics Committee of the Faculty of Dentistry of Niigata University (21-R26-10-02).

Methods

Measurement was accomplished between 14:00 and 15:00 hours in the middle of December, to standardize for the effects of the circadian rhythm (1) and climate (2). The students were divided into small groups consisting of two or three subjects. Each of them played the role of both subject and operator by rotation. First, the Saxon test was performed to measure the volume of stimulated saliva (3).

Next, an instructor (K.I.) demonstrated the methods for the two procedures. After the students had watched the demonstration, the subjects were in the supine on the dental chair and the two procedures were implemented under both dry and moistened conditions. First, the buccal mucosa was excluded with a dry surface dental mirror for 5 seconds (Fig. 1-A), after which the mirror was removed. Next, the same procedure was performed using a moistened mirror (mirror removal procedure). The other procedure was removal of a dental cotton roll from the gingivobuccal fold (cotton roll removal procedure). Two cotton rolls were placed in the upper anterior gingivobuccal fold bilaterally for 30 seconds. One cotton roll was removed as it was with forceps and the other was moistened before removal with a three way syringe (Fig. 1-B). The subject's comfort was evaluated on a

Fig. 2 Comparison of the moistened or dry conditions in the mirror removal procedure
 A : The subjects' comfort
 B : The operators' treatment ease
 Circles show outliers.

five point scale (1, uncomfortable; 2, slightly uncomfortable; 3, average, 4: somewhat comfortable, 5: comfortable). The ease of treatment for the operator was also evaluated on a five point scale (1, difficult; 2, slightly difficult; 3, of average difficulty; 4, somewhat easy; 5, easy).

Data Analysis

As all variables were not normally distributed, non-parametric analyses were used. To examine the relationship between the salivary volume and the subjects' comfort or the operators' treatment ease during the two procedures, Spearman coefficients were used. To compare the moistened with the dry condition, the Wilcoxon signed ranks test was used. In addition, to examine the relationship between the subjects' comfort and the operators' ease of treatment, Spearman coefficients were used. The statistical software used was SPSS16.0, and statistical significance was set at $P < 0.05$.

Results

Salivary volume and the subjects' comfort and operators' ease of treatment

The mean weight of the Saxon tests was 4.64 ± 1.30 g. There was no significant correlation between stimulated salivary volume and either the subjects' comfort or the

operators' treatment ease in the mirror removal procedure under dry conditions ($r = 0.04$, $r = 0.02$, respectively). Moreover, there was no significant correlation between stimulated salivary volume and either the subjects' comfort or the operators' treatment ease in the cotton roll removal procedure without moistening ($r = 0.15$, $r = 0.07$, respectively).

Comparison of the moistened and dry conditions in the two procedures

The mean rating for the subjects' comfort in the mirror removal procedure was 3.3 ± 1.0 for the dry condition and 4.7 ± 0.4 for the moistened condition, with the mean rating being significantly greater for the moistened condition ($P < 0.01$, Fig. 2-A). The operators' treatment ease was rated 3.3 ± 0.9 for the dry condition and 4.7 ± 0.6 for the moistened condition, with the mean rating being significantly greater for the moistened condition ($P < 0.01$, Fig. 2-B).

The mean rating for the subjects' comfort for the cotton roll removal procedure was 4.5 ± 0.9 for the moistened condition and 2.1 ± 0.7 for the dry condition, with the mean rating being significantly greater for the moistened condition ($P < 0.01$, Fig. 3-A). The mean rating for operators' treatment ease was 4.8 ± 0.4 for the moistened condition

Fig. 3 Comparison of the moistened and dry conditions in the cotton roll removal procedure
 A : The subjects' comfort
 B : The operators' treatment ease
 Circles show outliers.

Fig4 Comparison of the subjects' comfort and the operators' treatment ease
 A : The mirror removal procedure
 B : The cotton ball removal procedure

and 2.2 ± 1.2 for the dry condition, with the mean rating being significantly greater for the moistened condition ($P < 0.01$, Fig. 3-B).

Correlation between the subjects' comfort and the operators' ease

There was a significant strongly positive correlation between the subjects' comfort and the operators' ease for

both the mirror removal ($r = 0.79$, $P < 0.01$, Fig. 4-A) and the cotton roll removal procedures ($r = 0.77$, $P < 0.01$, Fig. 4-B).

Discussion

Although all participants in this study had normal salivation, comfort was significantly increased by moistening in both the mirror and cotton roll removal procedures. It

is known that discomfort and pain are easily produced due to hyposalivation. Therefore, using moistening techniques in these procedures may make them more comfortable for hyposalivation patients.

Special consideration is necessary in dental treatment of hyposalivation patients. There is empirical evidence that amalgam is the most successful restorative material for these patients because bonded materials appear to fail at a higher rate and self-curing glass ionomers fail in a dehydrated environment (4). However, there have been no articles concerning treatment techniques except a sentence that the buccal mucosa will stick to a mirror (4).

Before this study, we expected to find a positive correlation between the salivary volume and the subjects' comfort in the two procedures. However, there was no statistically significant difference. It has been reported that saliva moves like a film in the mouth (5). Dawes et al. revealed that the speed of movement of this salivary film is 0.8 mm/min in the upper-anterior buccal region and 8.0 mm/min in the lower -anterior lingual region, the velocity differing between these regions (6). In the present research, the subject was in the supine position in the dental chair and the buccal mucosa was excluded near the angle of the mouth. Therefore, under the influence of gravity, most of the parotid saliva might have flowed towards the posterior portion and away from the mirror, resulting in little saliva being in the region of the mirror. In addition, the cotton rolls were inserted into the upper anterior gingivobuccal fold. The velocity of the salivary film in this region might be slower in the upright position than in the dorsal position. These factors may account for the lack of correlation between the subjects' comfort and the salivary volume during the two procedures.

During dental treatment, exclusion of the buccal mucosa with a dental mirror and insertion of dental cotton rolls into the gingivobuccal fold to absorb moisture are frequently performed. Therefore, if the techniques described here need additional steps and have no merit, they would be stressful for the operator. However, this study revealed that not only moistening techniques brought the subjects' comfort and operators' ease but, also they exhibited a positive correlation. In other words, the techniques that are gentler for the subjects are also gentler for the operator. These results suggest that these techniques are useful not only in those

with normal salivation, but also in patients with hyposalivation.

However, the present study did have two limitations. First, the subjects were all healthy students. Future studies that include patients with hyposalivation are necessary. Second, the study procedure was neither randomized nor blinded. We chose a simple design because this was a student project and its main purpose was for the participating students to experience the degree of comfort/discomfort that patients might feel. In future studies, a randomized and blinded design should be used.

It is strongly recommended that dentists and dental hygienists use these techniques for all patients to the benefit of both patient and operator.

Conclusion

When using dental instruments and removing cotton rolls and gauze, moistening of the materials used increases both subjects' comfort and operators' treatment ease in healthy subjects.

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