

# THE ROLE OF INTERPROXIMAL CLEANING INSTRUCTIONS IN THE ORAL HYGIENE INDEX SCORE IMPROVEMENT

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## REZUMAT

**Obiective:** Obiectivele studiului sunt sublinierea necesității controlului plăcii interdente ca parte a igienizării orale zilnice a pacientului și descrierea pe scurt a tipurilor de profil ale pacientului român întâlnite în cadrul studiului. **Material și metode:** În cadrul studiului desfășurat pe o perioadă de 3 luni, 21 de subiecți (12 femei și 9 bărbați) au fost evaluați cu privire la igiena orală și, în special, al controlului plăcii bacteriene interproximale. Pentru înregistrarea cantitativă a plăcii am folosit indicele de igienă orală (OHI), după colorarea cu un revelator (Plaque Test - Ivoclar Vivadent™) a zonelor cu placă. După examinarea inițială, subiecților li s-a făcut o igienizare profesională și au fost atenți informați doar cu privire la importanța și metodele de realizare a igienizării interproximale. Scorul OHI a fost înregistrat din nou la 2 săptămâni și apoi la 3 luni. **Rezultate:** În cadrul examinării OHI la 2 săptămâni, toți subiecții au prezentat un indice de placă mai scăzut față de cel din examinarea inițială, cu un câștig de scor cuprins între 28,44% și 78,32%. Comportanța tuturor subiecților a fost foarte bună. În cadrul examinării OHI la 3 luni, OHI a rămas redus semnificativ față de examinările anterioare, dar există 3 evoluții ale scorului: în 9,52% dintre cazuri a rămas constant (profil nr.1), în 23,8% s-a îmbunătățit (profil nr.2) și în 66,68% a crescut ușor (profil nr.3). **Concluzii:** 1) Instrucția igienei interproximale dezvoltă o mai bună comportanță a pacientului. 2) Conform studiului nostru, există cel puțin trei tipuri de profil ale pacientului: pacientul cu profil nr.2 este foarte conștient, cu o bună comportanță și o îmbunătățire continuă a igienei orale. Pacientul cu profil nr.3, întâlnit frecvent, are nevoie de o terapie de menținere susținută. Chiar dacă este bine instruit cu privire la periajul dentar și flossing, controlul plăcii bacteriene scade în timp, abilitatea sa se menține, dar comportanța se diminuează. Pacientul cu profil nr. 1 este constant, dar poate evolua către profilul nr. 2 sau nr. 3.

**Cuvinte cheie:** Igiena interdentală, profilul pacientului, terapie de menținere

## ABSTRACT

**Objectives:** The aim of this study is to emphasize the necessity of the interdental plaque control as part of the patient's complete self-care program and to describe in brief the Romanian patient's profile types. **Material and methods:** In a randomized 3-month clinical study 21 subjects were evaluated regarding the oral hygiene control and, especially, the interproximal plaque control. For the quantitative plaque recording, the Oral Hygiene Index (OHI) was used after disclosing areas of inadequate plaque removal with a revelator (Plaque Test - Ivoclar Vivadent™). Following a baseline examination, subjects received a professional tooth cleaning and were very carefully informed only about the importance and devices of interproximal cleaning. The OHI score was recorded again after 2 weeks and also, after 3 months. **Results:** At 2 weeks OHI examination, all subjects had a lower plaque score when compared to the baseline level, with a gained value between 28.44% and 78.32%. The compliance was very good for all subjects. At OHI 3 months examination, the plaque remained significantly reduced compared to the previous two examinations, but there were three score evolutions: 9.52% of OHI scores remained constant (profile No.1), 23.8% improved (profile No. 2) and 66.68% slowly got worse (profile No. 3). **Conclusions:** 1) Interproximal oral hygiene instructions develop a better patient's compliance. 2) There are at least three patient profiles: the patient with profile No. 2 is very conscientious, with a good compliance and with a continuous oral hygiene improvement. Patient with profile No. 3, frequently encountered, needs a sustained maintenance therapy. Even if well trained in brushing and flossing, the plaque control deteriorates over time, the ability is maintained, but the compliance appears to diminish. The patient with profile No. 1 is constant, but can evolve towards profile No. 2 or profile No. 3.

**Key Words:** Interdental hygiene; patient profile; maintenance therapy

## INTRODUCTION

Plaque control is an essential part of every patient's self-care program.<sup>1</sup> Because of the special teeth and gingiva anatomy, tooth brushing alone (even vibratory and intrasulcular one, using Bass's, Stillman

or Charters methods) cannot remove plaque between tooth surfaces and adjacent gingiva and, thus, many patients are noncompliant.<sup>2-4</sup> As interdental hygiene is technically demanding, it is performed on a daily basis by only 10% of the population and there is overwhelming evidence to suggest that a substantial part of the population never floss at all.<sup>5</sup> Thus, the interdental zone is vulnerable and needs a special attention. Periodontal disease typically begins here, patients who have no interdental plaque control are more prone to develop gingivitis, periodontitis and also proximal caries. One of the principal challenges for the dental professional is to identify how best to elicit an improvement.

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At this moment, a lot of interproximal mechanical cleaning devices exist, and the choice can become, sometimes, difficult: floss, interdental brushes, interdental wooden and rubber tips.<sup>6</sup> These have all been found to be effective, the interdental anatomy, the patient's dexterity, preference and availability playing roles in the selection. The dental floss is the most widely recommended tool for removing plaque from proximal tooth surfaces.<sup>7</sup> This is available as a multifilament nylon yard that is waxed or unwaxed, thick or thin. The floss is able to reach into narrow interdental spaces and to remove plaque at the interproximal contact.<sup>8,9</sup> The tufted dental floss can be used in wide embrasures, under pontics, orthodontic appliances.<sup>10</sup> Interdental brushes are available in cone shaped or cylindrical shaped to accommodate the various dimensions of the interdental spaces. They are indicated for use on proximal tooth surfaces adjacent to open embrasures, periodontal splints, exposed class III furcations, fixed prostheses, orthodontic appliances, dental implants, space maintainers, concave proximal surfaces.<sup>11</sup> Brushes have the added advantage of serving as vehicles for the local application of antibacterial agents such as chlorhexidine digluconate or desensitizing agents for exposed sensitive root areas. Interdental wooden or rubber tips are also used in wide embrasures and in exposed proximal tooth surfaces.

## **MATERIAL AND METHODS**

The investigation was carried out as a randomized three months clinical study. Twenty-one subjects, 12 female and 9 male, between the ages of 17 and 78 years were evaluated regarding oral hygiene control and, especially, the interproximal plaque control. The inclusion criteria specified persons with no handicaps, with at least 10 natural teeth and not a dental professional. The sample size was calculated assuming a statistical power of 80%.<sup>12</sup>

The study was performed at the Faculty of Dental Medicine of Timișoara, in the Department of Periodontology, between January-March 2008. Following a baseline examination, subjects received a professional tooth cleaning and were very carefully informed only about the importance and devices of interproximal cleaning. Oral hygiene and patient's compliance were recorded again after two weeks and after three months. For quantitative plaque recording, the Oral Hygiene Index (OHI) was used after disclosure of the areas of inadequate plaque removal with a revelator (Plaque Test – Ivoclar Vivadent<sup>TM</sup>).

To calculate the OHI score, the maxillary and the mandibular arches were divided in six segments: anterior buccal and oral segments, distal right buccal and oral segments and distal left buccal and oral segments. Each segment was examined for debris or calculus. From each segment, one tooth was used to calculate the individual index, and the tooth used must have the greatest area covered by either debris or calculus. After the scores for debris and calculus were recorded, the Index values were calculated: for each individual, the debris scores are totalized and divided by the number of segments scored; the same method was used to obtain the calculus index scores. The scores for debris and calculus should be tabulated separately and indexes for each calculated independently, but in the same manner, as follows:

$$\text{Debris (or Calculus) Index} = (\text{The total of the upper and lower buccal-scores}) + (\text{The total of the upper and lower lingual-scores}) / (\text{The number of segments scored})$$

The Oral Hygiene Index was obtained, as follows:<sup>13</sup>

$$\text{Oral Hygiene Index} = \text{Debris Index} + \text{Calculus Index}$$

Following the baseline examination, each subject has received a professional prophylaxis. Debris, supra and subgingival calculus were removed with ultrasonic instruments. The tooth surfaces were polished with a professional abrasive paste and a rubber cup. Subjects were informed, motivated and individually instructed only for an auxiliary interdental hygiene. All subjects were provided with floss and interdental brushes of adequate size and were instructed to perform proximal hygiene once a day.

After two weeks, the OHI was determined again. On this occasion, the appropriate use of the mechanical devices was checked. The final examination was carried out after three months. The OHI was examined again.

### **Statistical analysis**

The odds ratio associated with OHI in this group is 0.5. The size of the odds ratio ranges between 0 and infinity. An odds ratio of 0.5 statistically indicates a good, positive effect. The standard deviation (S), a measure of the values dispersion, is 4.29.

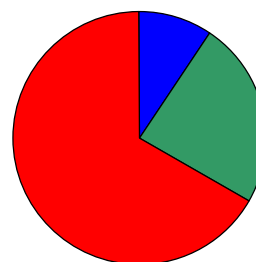
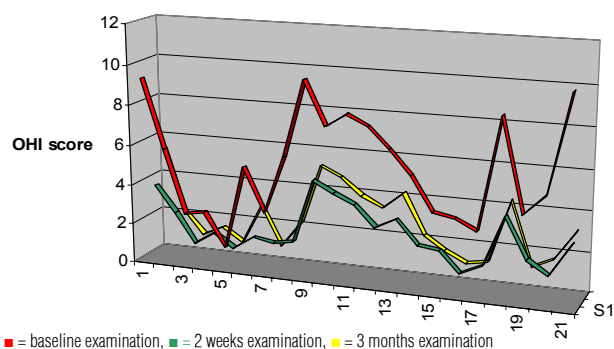
## **RESULTS**

The three months OHI score evolution and difference between examinations are shown in Table 1 and Figures 1-3.

**Table 1.** The OHI score at 3 months.

Subject	Gender	Age (years)	OHI at baseline examination	OHI at 2 weeks examination	OHI at 3 months examination
S1	F.	63	9.33	3.66 ▼	5.33 ▲
S2	M.	49	5.83	2.32 ▼	2.16 ▼
S3	M.	23	2.66	0.83 ▼	1 ▲
S4	M.	31	2.83	1.5 ▼	1.5 ■
S5	F.	22	1.16	0.83 ▼	0.83 ■
S6	F.	34	5.33	1.49 ▼	2.83 ▲
S7	F.	27	3.16	1.33 ▼	0.83 ▼
S8	F.	36	6	1.5 ▼	2.16 ▲
S9	M.	78	9.83	4.66 ▼	5.16 ▲
S10	F.	67	7.66	4.16 ▼	4.66 ▲
S11	F.	56	8.33	3.66 ▼	3.83 ▲
S12	F.	51	7.83	2.66 ▼	3.33 ▲
S13	F.	59	6.83	3.16 ▼	4.16 ▲
S14	M.	38	5.66	2 ▼	2.16 ▲
S15	F.	27	4	1.83 ▼	1.5 ▼
S16	M.	25	3.83	0.83 ▼	1 ▲
S17	F.	33	3.33	1.33 ▼	1.16 ▼
S18	M.	64	8.83	3.82 ▼	4.32 ▲
S19	F.	21	4.33	1.83 ▼	1.16 ▼
S20	M.	17	5.33	1.16 ▼	1.66 ▲
S21	M.	42	10.16	2.83 ▼	3.16 ▲

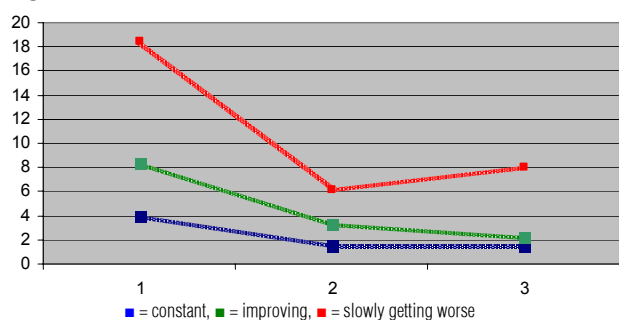
(▼ - decrease, ■ - constant, ▲ - increase)



■ = 66.68% slowly getting worse ■ = 23.8% improving ■ = 9.52% constant

**Figure 3.** The three months OHI score evolution.

**Figure 1.** The OHI score at three months.



**Figure 2.** Three months OHI score evolution.

## DISCUSSIONS

The establishment of a lifelong habit of interproximal cleaning is difficult to achieve for the patients.<sup>14</sup> In fact, the daily use of floss is universally low. It has been reported that only about 8% of 12 to 16 year olds in UK floss daily, with similar percentages reported for other countries.<sup>13,15,16</sup> Romanian patient has a lack of dental information regarding the importance of the interproximal cleaning as part of self-oral care daily program.<sup>17</sup>

Oral health, as well as oral awareness, are unequally distributed in societies with people with low socioeconomic status, exhibiting less awareness.<sup>18</sup> In this study, subjects with different age, education and socioeconomic status were evaluated, but the compliance was considered to be good for all subjects. Thus, oral hygiene instructions develop, indeed, a better patient compliance. Once informed, many subjects included in the study became more motivated. At baseline examination, there were significant differences in the OHI score: for 19.04% from subjects, this was high (> 8.5), for 52.38% was medium (>3.5 and <8.5) and for 28.58% it was low (< 3.5). After 2 weeks and after 3 months, the presence of plaque was and remained significantly reduced. At 2 weeks OHI examination, the compliance was considered to be very good for all subjects (all results are lower compared to baseline level). The increase in OHI score was between 28.44% and 78.32%. One explanation is the professional tooth cleaning, which all participants received at baseline. Removing supra- and subgingival calculus might have had a long-lasting positive effect. Furthermore, it cannot be excluded that the participation in the study motivated the participants to also improve their efforts.

At three months OHI examination, the presence of the plaque was and remained significantly reduced, but there were three OHI score evolutions:

- In 9.52 % the OHI score remained constant - profile no. 1;
- In 23,8 % OHI scores improved - profile no. 2;
- In 66.68% the OHI scores slowly got worse - profile no. 3.

Thus, in this study we found at least three patient's profiles: patients with profile No.2 is very conscientious, with a good compliance and with a continuous oral hygiene improvement (OHI < 3.5). The patient with profile no. 3, most frequently encountered, need a sustained maintain therapy. Even after a good training in brushing and flossing, the plaque control deteriorates over time, the ability is maintained but the compliance appears to diminish. Thus, with no further instruction, the plaque level reverses to the baseline level within a year.<sup>19,20</sup> The patient with profile no. 1 is constant, but it can develop towards profile no. 2 or profile no. 3.

## **CONCLUSIONS**

1. In healthy individuals, the intensified oral hygiene instructions with special emphasis on interdental cleaning devices resulted in significantly improved OHI score findings over a period of three months.

2. In the study, we worked with three patient profile types: type no. 2, with a good compliance, type no. 3, which needs a sustained maintained therapy and no. 1, constant.

3. One of the principal challenges for dental professional is to identify the patient's profile and how to best elicit the patient's oral hygiene improvement.

4. The maintenance therapy with a permanent oral complete hygiene reinstruction it is one of the most important therapeutic procedure for periodontal patients.

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