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**Experimentation in plaque control in
interproximal spaces using dental floss**

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TRIAL REPORT

INTRODUCTION

Complete domestic dental hygiene is guaranteed by daily cleaning of all dental surfaces: the treatment thus considers both the vestibular and lingual surfaces and the interproximal surfaces. For the plane surfaces of the teeth, one uses a toothbrush, which cannot reach the interdental zones, unless they are extremely distant. Hygiene in these zones is guaranteed by the use of a specific tool - dental floss- which enables the removal of food residue and plaque.

TRIAL HYPOTHESIS

Smart Floss™, whose diameter swells during use and, specifically, when subjected to mechanical solicitation, delivers better interdental plaque removal and helps reduce gingival bleeding.

TRIAL OBJECTIVES

Verification of the efficacy of **Smart Floss™** dental floss by comparison with other marketed dental floss types.

TRIAL MATERIALS & METHODS

The supposed efficacy of **Smart Floss™** was verified by comparison with three of the widest used and marketed types of dental floss, in order to verify which was best suited to the needs of the patients examined.

The trial involved 40 patients divided into 4 groups.

The first group used a waxed dental floss (green container), with the following technical characteristics: *Regular*, PA 6.6, Dtex 940/136, similar to Oral B traditional waxed dental floss.

The second group used a monofilament dental floss (light blue container), with the following technical characteristics: PTFE, Dtex 1200, folded, slightly waxed similar to Gore Glide Floss.

The third used a fine dental floss (neutral container), with the following technical characteristics: *Fine*, PA 6.6, Dtex 700/104), similar to Butler Fine unwaxed floss.

Finally, the fourth group used **Smart Floss™** floss (white container), with the following technical characteristics: PL, Dtex 1300/376.

The following parodontal indices were measured in each patient at the beginning and end of the trial:

- ✚ the bacterial plaque index, applying O'LEARY's (PCR) technique, using a bi-tonal plaque indicator;
- ✚ the bleeding index, applying the (GBI) AIMANO and BAY technique.

The patients did not have professional oral hygiene care but were instructed in oral hygiene technique with the use of toothbrush and dental floss.

The patients were re-examined after two weeks.

All patients had integral anatomical papillary structure. They were not informed of the type of dental floss used.

TRIAL RESULTS

All 40 patients completed the trial. The full details of the plaque and bleeding indices are provided in the table below.

For the **green container** (*Regular* waxed dental floss), at the first examination, an average PCR value of 41.60% and an average GBI value of 31.80% were recorded; while at the second examination the average PCR value was 19.90% and the average GBI value was 15.97%.

The mean percentage reduction in the plaque index was 52.16%, while the bleeding index fell by 49.78%.

For the **light blue container** (PTFE monofilament dental floss), at the first examination, an average PCR value of 53.17% and an average GBI value of 39.03% were recorded; while at the second examination the average PCR value was 29.79% and the average GBI value was 29.74%.

The mean percentage reduction in the plaque index was 43.97% while the bleeding index fell by 25.08%.

For the **neutral container** (*Fine* unwaxed dental floss) at the first examination, an average PCR value of 38.09% and an average GBI value of 24.66% were recorded; while at the second examination the average PCR value was 19.24% and the average GBI value was 16.82%.

The mean percentage reduction in the plaque index was 49.49 while the bleeding index fell by 31.79%.

For the **white container** (*Smart Floss*[™]) at the first examination, an average PCR value of 53.49% and an average GBI value of 18.49%; were recorded; while at the second examination the average PCR value was 16.12% and the average GBI value was 9.13%.

The mean percentage reduction in the plaque index was 69.86% while the bleeding index fell by 50.62%.

TRIAL CONCLUSIONS

All patients showed clinical improvement from the first to the second examination two weeks later, independent of the type of dental floss used.

The inter-group differences are significant, in particular with reference to the plaque index: the use of **Smart Floss**[™] delivered a mean reduction of almost 70%, notably superior to other flosses.

The reduction in the bleeding index was minimal only with reference to the *Regular* dental floss 50.62% and 49.78%, respectively.

Further, **Smart Floss**[™] was more efficacious with respect to the other dental flosses in the removal of dental plaque in patients with moderate to severe periodontitis.

TABLES

Neutral container (Fine unwaxed dental floss)

Pos.	Age	Sex	PCR1	PCR2	GBI1	GBI2
1	55	F	35.52%	15.78%	17.10%	5.26%
2	56	F	60.71%	46.43%	50%	46.43%
3	42	M	41.34%	20.19%	29.80%	25%
4	22	M	17.19%	4.69%	9.37%	3.12%
5	21	F	66.07%	16.07%	24.10%	7.14%
6	47	F	44.23%	33.65%	33.65	16.35%
7	47	M	56.25%	35.71%	40.18%	32.14%
8	29	F	16.38%	12.93%	19.83%	1.78%
9	21	M	38.39%	5.36%	8.03%	1.78%
10	26	F	4.84%	1.61%	14.52%	13.71%
Average			38.09%	19.24%	24.66%	16.82%

Light blue container (slightly waxed PTFE monofilament dental floss)

Pos.	Age	Sex	PCR1	PCR2	GBI1	GBI2
1	72	M	66.18%	45.59%	54.41%	47.06%
2	34	F	49.07%	35.18%	30.55%	21.30%
3	41	F	46.87%	37.50%	30.21%	22.92%
4	28	F	32.14%	25%	22.32%	16.96%
5	46	M	80.36%	40.18%	32.14%	0%
6	48	F	55.77%	22.11%	46.15%	37.50%
7	51	M	56%	45%	45%	42%
8	60	F	100%	27.42%	100%	87.90%
9	28	F	20.31%	9.37%	9.37%	2.34%
10	48	F	25%	10.58%	20.19%	14.42%
Average			53.17%	29.79%	39.03%	29.24%

Green container (Regular waxed dental floss)

Pos.	Age	Sex	PCR1	PCR2	GBI1	GBI2
1	68	M	67.19%	45.31%	53.12%	41.19%
2	27	M	20.37%	12.96%	11.11%	4.63%
3	25	F	17.50%	9.17%	4.17%	0%
4	32	F	15.52%	10.34%	6.90%	4.31%
5	67	F	52.94%	39.70%	6.18%	52.94%
6	52	M	68.52%	13.89%	32.41%	8.33%
7	20	M	13.71%	9.68%	8.87%	6.45%
8	21	F	46.09%	9.37%	30.47%	54.70%
9	64	F	80.88%	29.41%	80.88%	20.59%
10	25	M	33.33%	19.17%	28.33%	15.83%
Average			41.60%	19.90%	31.80%	15.97%

White container (*Smart Floss*[™])

Pos.	Age	Sex	PCR1	PCR2	GBI1	GBI2
1	29	F	28.12%	17.19%	20.31%	14.84%
2	46	M	54.81%	17.31%	49.04%	10.58%
3	53	M	72.22%	52.77%	44.44%	27.77%
4	45	M	18.75%	0%	7.14%	3.57%
5	24	F	94.80%	1.71%	11.21%	259%
6	34	F	36.16%	3.91%	21.87%	6.25%
7	32	F	13.33%	75%	4.16%	3.33%
8	48	F	100%	39.13%	19.56%	15.22%
9	36	F	9.37%	2.34%	0%	0%
10	31	F	33.93%	19.64%	7.14%	7.14%
Average			53.49%	16.12%	18.49%	9.13%

Summarizing table

Pos.	Type of floss	Container	PCR1	PCR2	GBI1	GBI2
1	<i>Fine</i> unwaxed	neutral	38.09%	19.24%	24.66%	16.82%
2	<i>Ptfe</i> lightly waxed	light blue	53.17%	29.79%	39.03%	29.24%
3	<i>Regular</i> waxed	green	41.60%	19.90%	31.80%	15.97%
4	<i>Smart floss</i> [™]	white	53.49%	16.12%	18.49%	9.13%

Average reduction in percentage indexes table

Pos.	Type of floss	Container	PCR	GBI
1	<i>Fine</i> unwaxed	neutro	49.49%	31.79%
2	<i>Ptfe</i> lightly waxed	azzurro	43.97%	25.08%
3	<i>Regular</i> waxed	verde	52.16%	49.78%
4	<i>Smart floss</i> [™]	bianco	69.86%	50.62%

Observations

The mean result obtained with in plaque reduction: **Smart Floss**[™] is superior by 43.92% to the average of other dental flosses.

The mean result obtained in the reduction of the bleeding index: **Smart Floss**[™] is superior by 42.39% to the average of other dental flosses.