

.

I.

Host response

가

가

7-

15),

가

가

.1)2)

16).

1983 Kortsch

가

가

3-6).

가

17). 1983 Magness

가

.18)

1950 Hine

가,

가,

:

134

120 - 752

1) 29 22
51 * 가
**

가

2) 가

(Figure 1).

3) 가
가. 가
i. (SC)
(tooth brushing instruction: TBI)
modified bass
method 5 stroke
scrubbing

II.

1.

Y

standard toothpaste
3
, dental floss, inter -
dental brush, water pick oral hygiene
products

12

ii. 1 baseline
1 1

2.

iii.
scaling 1 baseline
1 , 2 , 4
(Table 1) 4



Figure 1. Overall view of Silicon toothbrush

* : No. 311, Butler Co.
** : Jefe Inc.

Table 1. Study design

	baseline(Sc	1 wk)	1week	2week	4week
probing pocket depth	*			*	
plaque index	*		*	*	*
Gingival index	*		*	*	*
BOP	*		*	*	*

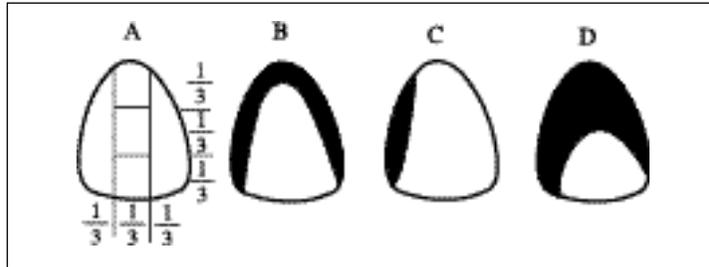


Figure 2. Patient Hygiene Performance Index
B: 3 . C: 1 . D: 4

- i. (Probing pocket depth: 0: PD) 1: color - coded probe(CP - 15UNC, Hu - Fried) 6 , . 1. / .
- ii. Patient Hygiene Performance Index(PHP, Podshadly & Haley 1968) - Erythrosin - - .(0-5) 2. 가 ? 3. ? 4. ? 5. 가
- iii. (Lobene Gingival index) 0 = ? 1 = ; 가 6. 가 ? 7. ? 2 = ; 가 8. ? 3 = ; , , / ? 4 = ; , , / III. 51
- iv. (Bleeding on Probing : BOP)

Table 2. Comparison of Plaque values differences between groups

	baseline	1week	2week	4week
		Mean \pm S.D	Mean \pm S.D	Mean \pm S.D
Control	0	0.091 \pm 0.812	0.245 \pm 0.691	0.329 \pm 0.670
Experimental	0	0.109 \pm 0.367	0.139 \pm 0.364	0.228 \pm 0.597

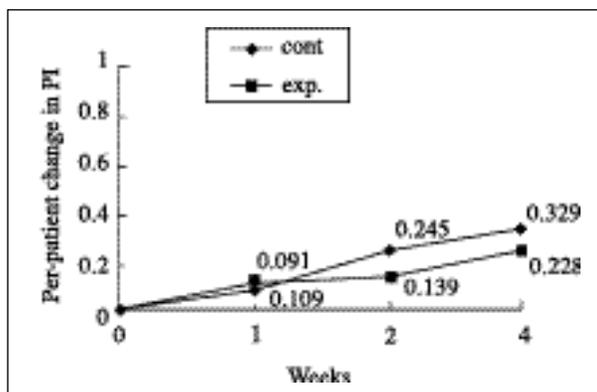
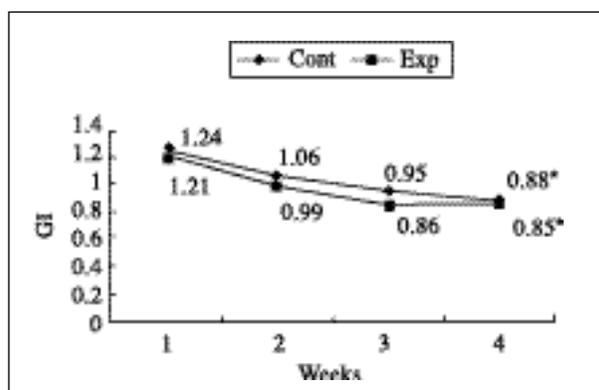


Figure 3. Comparison of Plaque Index differences

Table 3. Comparison of Mean Gingival values between groups

	baseline	1week	2week	4week
		Mean \pm S.D		
Control	1.24 \pm 0.65	1.06 \pm 0.47	0.95 \pm 0.39	0.88 \pm 0.42*
Experimental	1.21 \pm 0.70	0.99 \pm 0.70	0.86 \pm 0.62	0.85 \pm 0.62*

* : significant from baseline $P < 0.05$



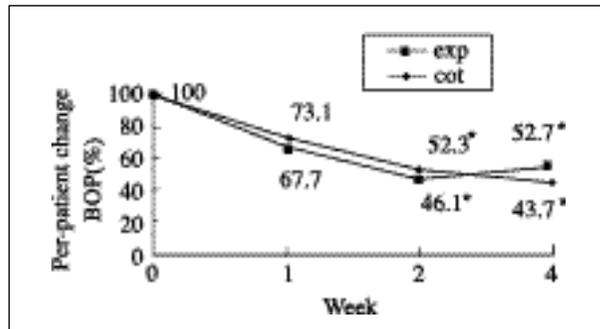
* : significant from baseline $P < 0.05$

Figure 4. Comparison of Gingival Index

1. line 1, 2, 4, P<0.05
 2. base - baseline P<0.05
 1, 2, 4 P<0.05 1, 2, 4

Table 4. Comparison of Mean Pocket Depth values between groups

	baseline	4week
	Mean ± S.D	Mean ± S.D
Control	2.64 ± 0.53	2.44 ± 0.46
Experimental	2.63 ± 0.61	2.51 ± 0.53



* : significant from baseline : P<0.05

Figure 5. Comparison of Bleeding on Probing

Table 5. Result of Interview

(83)		
, ?	8	75
? 가?	48	35
	44	39
	6	77
	68	15
	64	19
	25	31
	24	3

P<0.05

가

8

3.

가

baseline

base

가

line

P<0.05

0.29%

4.

4.34%

2, 4

baseline

P<0.05

가

P<0.05

5.

(Table 5)

IV.

가

가

가

4

가

Bass

.36)

가

가

1960

가

가

가

1

baseline

가

가 가

1, 2, 4

P<0.05

2. (Lobene Gingival index)

4 base line

P<0.05

1, 2, 4

P<0.05

3. (Probing depth) baseline

baseline

P<0.05

4. (Bleeding on probing)

2, 4

base line

P<0.05

P<0.05

가 가

V.

가

가 4

1 baseline

, 1, 2, 4

VI.

1. (Patient Hygiene Perfomance Index)

baseline 1, 2, 4

P<0.05

1. Ainamo, J.: Control of plaque by chemical agent, J. Clin. Periodont., 4:23, 1977.

2. Theilade, J.: Dental Plaque & Dental calculus ; In Lindhe, J, ed. Textbook of periodontology, 1983.

- Copenhagen : Munksgaard.
3. Adriaens, P.A., Seynhaeve, T.M., Debover, J.A.: A morphologic and S.E.M. investigation of 58 Toothbrushes, *Clin. Preven. Dent.*, 7:8, 1985
 4. Bay, I., Kardel, K.M., Skaugaard, M.R.: Quatitive evaluation of plaque removing ability of different type of toothbrush, *J. Periodonntol.*, 38:526, 1967.
 5. Hine, M.K.: The use of toothbrush in the treatment of peiodintitis, *J.A.D.A.*, 41:158, 1950.
 6. , , , .: ., 113 - 122, 1979.
 7. Allen, R.W.B. and Nahodil, M.G.: A transducer for measuring the force exerted on teeth by a toothbrush during brushing, *J. Dent. Res.* , Abs. No. 120, 5:1272, 1972.
 8. Bass, C.C.:l The optimum charac - teristics of toothbrushes for personal oral hygiene, *Dent. Items Int.*, 70:921, 1948.
 9. Berodn, J.K., Hornbrook, H.H. and Hayduk, S.E.: An evaluation fo 6 manual toothbrushes comparing their effective - ness in plaque removal, *J. Periodontol.*, 45:496, 1974.
 10. Breitenmoser, J., Mormann, W. and Muhlemann, H.R.: Damaging effects of toothbrush bristle end form on gingi - va, *J. Periodontol.*, 50:212, 1979.
 11. Burgett, F.G. and Ash, M.M.: Comparative study of the pressure of brushing with three types of tooth - brushes, *J. Periodontol.*, 45:410, 1974.
 12. Frleigh, C.M., Elhaney, J.H. and Heiser, R.A.: Toothbrushing force study, *J. Dent. Res.*, 46:206, 1967.
 13. Grabenstetter, R.J., et al.: The measurement of the abrasion fo human tooth by dentifrice abrasives.: A test utilizing radioactive teeth, *J. Dent Res.* , 55:311, 1976.
 14. Horowitz, A.M. and Suomi, J.D.: A comparision of plaque removal with a standard and an unconventional tooth - brush used by youngsters, *J. Periodontol.*, 45:760, 1974.
 15. Waerhaug, J.: Effect of tooth - brushing on subgingival plaque forma - tion, *J. Periodontol.*, 52:30, 1981.
 16. Sangnes, G.: Traumatization of teeth and gingival related to habitual tooth cleansing procedure, *J. Clin. Periodontol.*, 3:94, 1976.
 17. Kortsh, W.E.: Challenging the soft brush, *J.A.D.A.* 106:594, 1983.
 18. Magness, W.B.: Soft or hard bris - tles, *J.A.D.A.* 107:144, 1983.
 19. Bergenholtz, A.: Role of brushing technique and toothbrush design in plaque removal, *Scand. J. Dent. Res.*, 92:344, 1984.
 20. , , , .: ., 1987.
 21. , , , .: ., 1988.
 22. Park, K.K.: Choosing an effective toothbrush; A risk venture, *Clin. Prev. Dent.*, 7:5, 1985.
 23. .:

- 495, 1987.
24. , .:
- ., 25(5),
- . Vol.25. No.2,1987.
25. Bastian, R.J.: A comparison of the clinical effectiveness of a single and a

- double headed toothbrush. *J. Clin. Periodontol.*,11:331,1984.
26. Gibson, M. T., Joyston - Bechal, S. & Smales, F.C. : Clinical evaluation of plaque removal with double headed toothbrush. *J. Clin. Periodont.* 5:94,1988.
 27.15(1):93, 1991.
 28. Shory N.L., Mitchell G.E., Jamison H.C.: A study of the effectiveness of two types of toothbrushes for removal of oral accumulations, *J.A.D.A.* 115:717,1987.
 29. American dental association, Council on Dental Therapeutics.: *Accepted Dental Therapeutics*. 36th ed., p.281, A.D.A., Chicago.1975.
 30. Niemi, M - L., Sandholm, L. & Ainamo, J. : Frequency of gingival lesions after standardized brushing as related to stiffness of toothbrush and abrasiveness of dentifrice. *J. Clin. Periodont.* 11:254,1984.
 31. Dellerman, P.A., Buekett, T.A. & Kreyling, K. M.: A Comparative evaluation of the percent acceptable end - rounded bristle: Butler G.U.M., Colgate Plus, Crest Complete, and Reach. *J. Clin. Dentistry*.5:38,1994.
 32. Mulry, C.A., Dellerman, P.A., Ludwa, R. & White, D.J. : A comparison of the end - rounding of nylon bristle in commercial toothbrushes: Crest Complete and Oral - B . *J. Clin. Dentistry*. 3:47,1992.
 33. Khocht, A., Simon, G., Person, P. & Denepitya, J.L. : Gingival recession in relation to history of hard toothbrush use. *J. Periodontol.* 64:900,1993.
 34. Van der Weijden, G.A., Timmerman, M.F., Reijerse, E., Danser, M.M., Mentel, M.S., Nijboer, A. & Van der Velder, U. : The long term effect of an oscillating/rotating toothbrush. An 8 - month clinical study. *J. Clin. Periodont.* 21:139,1994
 35. Danser, M.M., Timmerman, M.F., Itzerman, Y., Bulthuis, H., Van der Velden, U. & Van der Weijden, G.A. : Evaluation of the incidence of gingival abrasion as a result from toothbrushing. *J. Clin. Periodont.* 25, 1998
 36. Gibson, J.A.: Plaque removal by the bass and roll brushing techniques. *J. Periodontol.* 48:456, 1977.
 37. Quigley G.A., Hein J.W.: Comparative cleansing efficacy of manual power brushing. *J.A.D.A.*, 65:26 - 29,1962.
 38. Finkelstein, P.: The clinical preventive assesment of the mechanical cleaning efficiency of toothbrushes, *J. of Clinical Preventive Dentistry*. Vol.6, No.3, 1984.
 39. Yankell, S.L., Green, P.A., Greco, P.M., Stollen, N.H. and Miller, M.F.: Test procedure and scoring criteria to evaluate toothbrush effectiveness, *J. of Clinical Preventive Dentistry*, Vol.6. No.2, 1984.
-

- Abstract -

The Effect of Silicone Toothbrush on Plaque Control and Gingival Inflammation. A Comparative Clinical Study

Yeh - Jin Chung, Chang - Sung Kim, Jong -
Jin Suh, Kyoo - Sung Cho, Jung - Kiu Chai,
Chong - Kwan Kim, Seong - Ho Choi

Department of Periodontology, College of
Dentistry, Yonsei University
Research Institute for Periodontal
Regeneration

A comparative clinical study on the ordinary toothbrush (Buttler, America) and the silicone toothbrush (Jefe, Korea) was performed. The volunteers who took part in this study were students of Dental college of Yonsei University and patients attending Dental Hospital of Yonsei University.

They were classified into two groups, control and experimental group. Control group brushed with nylon toothbrush and experimental group did with silicone toothbrush under the researcher's guidance.

Volunteers were examined on Plaque Index (PI), Gingival Index (GI), Probing Depth (PD), Bleeding on Probing (BP) and Recession (R) at base line, 1st. week, 2nd. week and 4th. week.

According to the results, both groups have the tendency of improvement in the degrees of GI, PI and the improvement degree of GI of both groups has the significant differences from base line statistically, and there are not statistically significant differences between the silicone and nylon group in respect of PI, GI values.

So based on the present study, it could be carefully ascertained that the silicone toothbrush has similar effect with nylon toothbrush in respect of PI and GI.

If it is sure that the silicone toothbrush is seldom abrasive and possibly enough to massage the gingiva, this new brush is worth to be recommended by the dentists.

Key words : silicone toothbrush, Plaque control, Gingival Recession, abrasion, massage