

# Polycaprolactone Strip( 30% Minocycline ) 가

\* . \* . \* . \* . \* . \* . \*

\*  
\*\*

I.

tetracycline fiber, metronidazole dental gel, chlorhexidine chip, minocycline gel, doxycycline polymer<sup>7-9)</sup>.

1-3),

가

가 4, 5).

가 가

가

가

가

가

가

가

polycaprolactone

polyester

6)

<sup>10)</sup>. Minocycline

tetracycline

가가

가

11). 12) 20% 30% minocycline  
polycaprolactone 가  
7

13) 30%  
minocycline polycaprolactone  
가 7

14) 30%  
minocycline polycaprolactone  
가  
가  
4mm

17) 0.1% chlorhexidine  
30% minocycline  
polycaprolactone 가  
18, 19) 5mm  
가

20)  
가

30% minocycline  
polycaprolactone strip( )  
가  
가

II.

1.  
2  
4mm  
가  
4 1  
12 . 15) 22 - 60  
5 7  
46.1 ± 9.8 .  
가  
1  
, candida  
, tetracycline  
가  
.

2. Minocycline Strip  
minocycline strip  
( , , )  
polycaprolactone minocycline  
가  
5.7mg  
1mg minocycline · HCl  
.

3.  
가  
2

4mm 1 가 가4 3 2 2  
 1 minocycline strip strip  
 가 4 3  
 1 strip .  
 1 (RP) 1 , 3 6  
 , 2 (RP+MC) .  
 minocycline strip  
 1 3 (MC) 4.  
 minocycline strip  
 1 , (baseline, 0), 1 , 3  
 4 (MCx2) 1 2 6 1) (Plaque Index,  
 minocycline strip 2 Silness & Löe)<sup>21)</sup>, 2)  
 . 1 (Bleeding on probing), 3)  
 1 (Probing Pocket Depth) 4)  
 . 2 (Clinical Attachment Level) ,  
 1 6 ,  
 minocycline strip 4mm  
 , 3 minocycline strip .  
 3 strip  
 strip 5.  
 4 . 4

Table 1. Plaque Index(mean ±SD)

month	Group 1(RP)	Group 2(RP+MC)	Group 3(MC)	Group 4(MCx2)
0	1.58 ± 0.51	1.50 ± 0.52	1.58 ± 0.51	1.67 ± 0.49
1	0.83 ± 0.39*	0.92 ± 0.29*	1.00 ± 0.43*	1.08 ± 0.51*
3	1.00 ± 0.43*	0.92 ± 0.29*	1.08 ± 0.51*	1.00 ± 0.74*
6	1.17 ± 0.45*	1.00 ± 0.43*	1.16 ± 0.39*	1.08 ± 0.52*

\*significantly different from baseline (P<0.05)

Table 2. Percent of Bleeding on Probing(%)

month	Group 1(RP)	Group 2(RP+MC)	Group 3(MC)	Group 4(MCx2)
0	100	100	100	100
1	41.7	33.3	50.0	50.0
3	50.0	41.7	58.3	58.3
6	67.7	58.3	67.7	67.7

1.

가

paired t - 1, 3 6

test(<0.05)

(Table 1).

(ANOVA)

Tukey test(<0.05) 2.

III.

1, 3 6  
2 가  
1

Table 3. Probing Pocket Depth(mean ± SD in mm)

month	Group 1(RP)	Group 2(RP+MC)	Group 3(MC)	Group 4(MCx2)
0	5.50 ± 0.52	5.17 ± 0.83	5.25 ± 0.75	5.08 ± 0.79
1	4.00 ± 0.74*	3.83 ± 0.83*	4.08 ± 0.79*	3.67 ± 0.98*
3	4.08 ± 0.51*, †(2)	2.91 ± 0.29*, †(1, 3, 4)	4.08 ± 0.67*, (2)	3.75 ± 0.92*, †(2)
6	4.16 ± 0.72*, †(2)	3.08 ± 0.67*, †(1, 3)	4.25 ± 0.45*, †(2)	3.83 ± 0.94*

\*significantly different from baseline (P<0.05).

†( ) significantly different from those shown parenthesis at each periods (P<0.05).

Table 4. Reduction of Probing Pocket Depth(mean ± SD in mm)

month	Group 1(RP)	Group 2(RP+MC)	Group 3(MC)	Group 4(MCx2)
1	1.50 ± 0.67	1.25 ± 0.62	1.17 ± 0.83	1.42 ± 1.08
3	1.42 ± 0.67 †(2)	2.33 ± 0.89 †(1, 3, 4)	1.17 ± 0.71 †(2)	1.33 ± 0.98 †(2)
6	1.33 ± 0.89	2.00 ± 0.60 †(3, 4)	1.00 ± 0.67 †(2)	1.25 ± 0.87 †(2)

†( ) significantly different from those shown parenthesis at each periods (P<0.05).

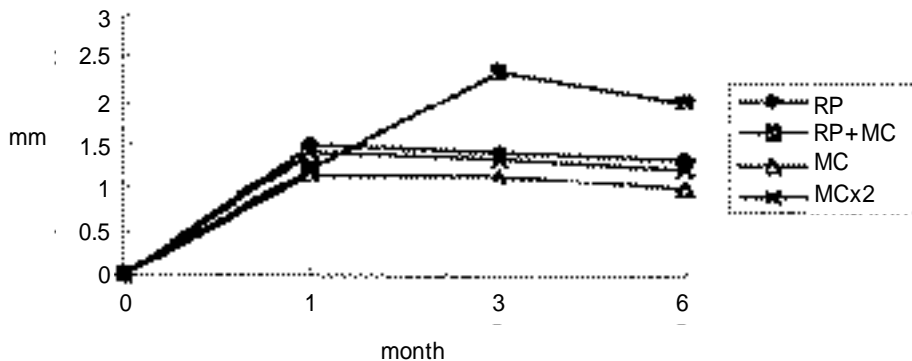


Figure 1. Mean reduction of probing pocket depth

(Table 2).

3. 가 3 6 가 6 가 1, 3, 4 1

가 3 6 가 (Table 3).

1, 3 6 1 1 가

2 가 가 1 6 2 3 가 가

6 가 3 가 6 1, 3 4 1 3 6

, 3 4 3 2 1 6 가 3 6 (Table 4, Figure 1).

2 3 4.

Table 5. Clinical Attachment Level(mean ± SD in mm)

month	Group 1(RP)	Group 2(RP ± MC)	Group 3(MC)	Group 4(MC × 2)
0	5.92 ± 0.51	5.67 ± 0.65	5.67 ± 0.65	5.42 ± 0.51
1	5.33 ± 0.49*	4.83 ± 0.39*	5.00 ± 0.43*	4.83 ± 0.57*
3	5.41 ± 0.51*†(2)	4.25 ± 0.45*†(1, 3)	5.17 ± 0.94†(2)	4.92 ± 0.78
6	5.58 ± 0.51†(2)	4.58 ± 0.39*†(1, 3)	5.33 ± 0.78†(2)	5.08 ± 0.67

\*significantly different from baseline (P<0.05).

†( )significantly different from those shown parenthesis at each periods(P<0.05).

Table 6 Clinical Attachment Gain(mean ± SD in mm)

month	Group 1(RP)	Group 2(RP ± MC)	Group 3(MC)	Group 4(MC × 2)
1	0.58 ± 0.51	0.75 ± 0.45	0.58 ± 0.52	0.67 ± 0.49
3	0.50 ± 0.52†(2)	1.42 ± 0.67†(1, 3, 4)	0.42 ± 0.90†(2)	0.50 ± 0.90†(2)
6	0.42 ± 0.67	1.08 ± 0.58	0.33 ± 0.78	0.33 ± 0.89

†( )significantly different from those shown parenthesis at each periods(P<0.05).



(MIC)

가

1 strip 1 24 - 31) 가

minocycline strip (monotherapy) . Tetracycline fiber ,

가 minocycline strip 가 가

1 2 가 25, 26, 32) ,

minocycline strip 33 - 35) . 25%

1 1 metronidazole gel<sup>[36 - 38)</sup> 25% minocycline gel<sup>[39 - 41)</sup>

6 ,

minocycline strip Doxycycline polymer 가 가

24 - 31) 31) , chlorhexidine chip 가 가 42)

가 가

1 2 minocycline strip 가 (combined therapy)

가 가 minocycline strip

strip minocycline strip

가가

가 strip minocycline strip 가 가

가 6 (2.00 vs. 1.33 mm)

(1.08 vs. 0.42 mm)가

Killoy 43)

tetracycline fiber Newman  
6 ( : 1.81 vs.  
1.08mm, 1.08vs. 0.58 mm)<sup>33)</sup>

가  
가

가

1, 3 6

가

가

가 minocycline strip  
3

1

가 6

split mouth

design

가 minocycline strip  
6

가

가

가

가

minocycline strip 3 1

가

minocycline strip

가

minocycline strip

가  
minocycline strip

12, 13)

Killoy 43) 1 1-2  
teracycline fiber 3

1  
가

fiber tetracycline

가

V.

minocycline strip 가

30% minocycline  
polycaprolactone strip(  
가 split mouth design

가



4가  
 ( 1 ), minocycline strip  
 1 1 ( 2 ),  
 minocycline strip 1 1  
 ( 3 ), minocycline strip 1  
 2 ( 4 ) , 6

30% minocycline  
 polycaprolactone strip  
 가

VI.

1. 1, 3 6  
 2 가  
 1  
 3 6  
 가

2. 1, 3 6  
 가  
 2 가  
 1 가

3 6  
 2 가  
 1, 3 4

3. 2 가  
 1  
 가 2  
 3 가  
 2  
 가 , 3  
 가 1  
 , 3 4

1. Listgarten MA, Lindhe J, Hellden L : Effect of tetracycline and/or scaling on human periodontal disease - Clinical, microbiological and histological observations. J Clin Periodontol 1978;5:246 - 251.
2. Slots J : Subgingival microflora and periodontal disease. J Clin Periodontol 1979;6:351 - 358.
3. Slots J, Mashimo PA, Levine MJ, Genco RJ : Periodontal therapy in human. I. Microbiological and clinical effects of a single course of periodontal scaling and root planning for adjunctive tetracycline therapy. J Periodontol 1979;50:495 - 592.
4. van Winkelhiff AJ, Rams TE, Slot J : Systemic antibiotic therapy in periodontics. Periodontol 2000 1996;10:47 - 78.
5. Drisko CH : Nonsurgical therapy: Pharmacotherapeutics. Ann Periodontol 1996;1:491 - 518.
6. Goodson JM: Controlled drug delivery: A new means of treatment of dental disease. Compend Cont Educ Dent 1985;6:27 - 36.
7. Kornman KS : Controlled release local delivery antimicrobials in periodontics: Prospects for the future. J Periodontol 1993;64:782 - 791.

8. Rams TE, Slots J : Local drug delivery of microbial agents in the periodontal pocket. *Periodontol* 2000 1996;10:139 - 159.
9. Greenstein G, Polson A : The role of local drug delivery in the management of periodontal disease: A comprehensive reviews. *J Periodontol* 1998;69:507 - 520.
10. Woodward SC, Brewer PS, Moatamed F : The intercellular degradation of poly(ε-caprolactone). *J Biomed Mat Res* 1985;19:437 - 444.
11. Somerman MJ, Foster RA, Vorsteg G, Progebin K, Wynn RL : Effect of minocycline on fibroblast attachment and spreading. *J Periodont Res* 1988;23:154 - 159.
12. , , , , :  
. 1990;28:177 - 188.
13. , , , , , : 30% Minocycline  
. 1992;16:169 - 174.
14. , :  
. 1991;21:205 - 212.
15. , , , :  
. 1994;24:397 - 405.
16. , , :  
가.  
1994;24:493 - 502.
17. , : 30% Minocycline Strip  
0.1% chlorhexidine  
. 1991;21:213 - 222.
18. Kim WK, Chung CP, Choi SM : Clinical & Microbiological effects of minocycline loaded polycaprolacton film on adult periodontitis. *J Kor Acad Periodontol* 1991;21:222 - 236.
19. , , , :  
. 1992;27:237 - 247.
20. , , :  
Minocycline  
Polycaprolactone film  
. 1994;24:421 - 431.
21. Silness J, L  H : Periodontal disease in pregnancy. II. Correlation oral hygiene and periodontal condition. *Acta Odontol Scand* 1964;121 - 135.
22. Ciancio SG, Mather MA, McMullen JA : An evaluation of minocycline in patient with periodontal disease. *J Periodontol* 1980;51:530 - 534.
23. Baker PJ, Evans RT, Slot J, Genco R : Susceptibility of human oral anaerobic bacteria to antibiotics suitable for topical use. *J Clin Periodontol* 1985;12:201 - 208.
24. Goodson JM, Cugnigi RL, Kent RL, Armitage GC, Cobb CM, Fine D, Fritz ME, Green E, Imoberdorf MJ, Killoy WJ, Mendieta C, Niederman R, Offenbacher S, Taggart EJ, Tonetti M : Multicentor evaluation of tetracycline fiber therapy: II Clinical response *J Periodont Res* 1991;26:371 - 379.

25. Goodson JM, Hogan P, Dunham S : Clinical response following periodontal treatment by local drug delivery. *J Periodontol* 1985;56:81 - 87.
26. Heijl L, Sudin Y, Wenande A, Goodson JM : A 4 quadrant comparative study of periodontal treatment using tetracycline containing drug delivery and scaling. *J Clin Periodontol* 1991;18:111 - 116.
- 27 Klinge B, Attstrom R, Karring T, Kitsch J, Lewin B, Stoltze K : 3 regimens of topical metronidazole compared with subgingival scaling on periodontal pathology in adults. *J Clin Periodontol* 1992;19:708 - 714.
28. Ainamo J, Lie T, Ellingsen BH, Hansen BF, Johansson LA, Karring T, Kisch J, Paunio K, Stoltze K : Clinical responses to subgingival application of a metronidazole 25% gel compared to the effects of subgingival scaling in adult periodontitis. *J Clin Periodontol* 1992;19:723 - 729.
29. Jonse A, Wood R, Newbold D, Manwell M, Kornman K.: Clinical effects of subgingival minocycline in periodontitis. *J Dent Res* 1992;71 (Spec Issue):245 (Abstr.1114).
30. Braswell L, Offenbacher S, Fritz M, Van Dyke TE. : Local delivery of minocin to periodontal lesions in a slow release polymer. *J Dent Res* 1992 ; 71 ( S p e c Issue):245 (Abstr.1115).
31. Garret S, Adams D, Bandt C, Beiswanger B, Bogle G, Caton J, Doly K, Drisko C, Hallmon W, Hancock B, Hances B, Hawley C, Johnson L, Kiger R, Killoy W, Mellonig J, Polson A,

Ryder M, Wang H, Wolinsky L, Yukna R. : Two multicenter clinical trials of subgingival doxycycline in the treatment of periodontitis. J Dent Res 1997;76(Spec Issue):153(Abstr.1113).

32. Drisko CL, Cobb CM, Killoy WJ, Michalowicz BS, Philstrom BL, Lowenguth RA, Caton JG, Encarnacion M, Knowles M, Goodson JM : Evaluation of periodontal treatment using controlled - release tetracycline fiber. Clinical response J Periodontol 1995;66:692 - 699.
33. Newman MG, Kornman KS, Doherty FM : A 6 - month multi - center evaluation of adjunctive tetracycline fiber therapy used in conjunction with scaling and root planing in maintenance patients: clinical results. J Periodontol 1994;65:685 - 691.
34. Vanderkerckhove BNA, Qurynen M, van Steenberghe D : The use of tetracycline containing controlled release fibers in treatment of refractory periodontitis. J Periodontol 1997;68:353 - 361.
35. Michalowicz BS, Philstrom BL, Drisko CL, Cobb CM, Killoy WJ, Caton J, Lowenguth RA, Quinones C, Encarnacion M, Knowles M, Goodson JM : Evaluation of periodontal treatment using controlled - release tetracycline fibers: Maintenance response. J Periodontol 1995;66:708 - 715.
36. Stelzel M, Flores - de - Jacoby L : Metronidazole application asan adjunctto subgingival scaling. J Dent Res 1996;75(Spec Issue):159(Abstr.1109).
37. Riep B, Puruker P Hopfenmuler W, Bernimoulin JP : Repeated localmetronidazole application combined with scaling and root planing. J Dent Res 1996;75(Spec Issue) :159(Abstr.1135).
38. Noyan U, Yilmaz S, Kuru B, Kadir T, Acar O, Buget E : Aclinical and microbiological evaluation of systemic and local metronidazole delivery in adult periodontitis patients. J Clin Periodontol 1997;24:158 - 165.
39. van Steenberghe D, Bercy P, Kohl J , De Boever J, Adriaens P, Vanderfaeillie A, Adriaenssen C, Rompen E, De Vree H, McCarthy EF, Vandenhoven G : Subgingival minocycline hydrochloride ointment in moderate to severe chronic adult periodontitis: A randomized , double blind, vehicle controlled, multicenter study. J Periodontol 1993;64:637 - 644.
40. Timmerman MF, van der Weiden GA, van Steenbergen TJM, Mantel MS, de Graaff J, van der Velden U : Evaluation of the long term efficacy and safety of locally applied minocycline in adult periodontitis patients. J Clin Periodontol 1996;23: 707 - 716.
41. Graca MA, Watts TLP, Wilson RF, Palmer RM : A rrandomized, controlled trial of 2% monocycline gel as adjunct to non - surgical periodontal treatment, using a design with multiple matching criteria. J Clin Periodontol 1997;24:249 - 253.
42. Soskolne WA, Heasman PA, Stabholtz A, Smart GJ, Palmer M, Flashner M, newman HN : Sustained local delivery of chlorhexidine in the treatment of periodontitis: a multicenter study. J Periodontol 1997;68:32 - 38.
43. Killoy WJ, Rapley JW, Drisko CL, Yonke ML, Ridenhour LS : Single and repeated