

1 sulfate

calcium

. . .

I.

, Urist¹⁾

가

가

. Bowers ¹⁰⁾

가

가

가

. 가

Bone Morphogenetic Protein(BMP) ,

11).

, Bowers ¹²⁾,

가 Mellonig ^{13, 14)}, Pearson ¹⁵⁾

1965 Urist¹⁾
2-8)

0.6N

. Bowers ¹²⁾

Libin⁹⁾

Calcium sulfate 1892

BMP calcium sulfate
 가 ,
 가 carrier
 , Sottosanti^{23 - 25)} calcium
 sulfate
 calcium sulfate

16). Calcium sulfate

30

1955 Weinmann Sicher¹⁷⁾ calcium sulfate

calcium sulfate

calcium sulfate가

, 1957 Peltier¹⁸⁾
 calcium sulfate가

2

가

calcium

가

Calhoun¹⁹⁾
 sulfate가

calcium

calcium sulfate

1

Radentz Colling²⁰⁾

8

calcium sulfate가 3 - 6

12

1971 Shaffer, App²¹⁾

II.

calcium sulfate

1.

1988 Yamazaki²²⁾

1

1 Experimental Design

Experimental group	Control	Group I	Group II	Group III
Graft material	No	calcium sulfate	DFDB+calcium sulfate	DFDB

DFDB: Decalcified freeze dried bone

*Calcium sulfate, Edgemark Co., U.S.A.

15kg
 4 , round bur notch
 100% ethyl alcohol 1
 1 - 2 - 80 °C
 100% ethyl alcohol 0.6N HCl

1/4
 가

medical grade calcium sulfate*

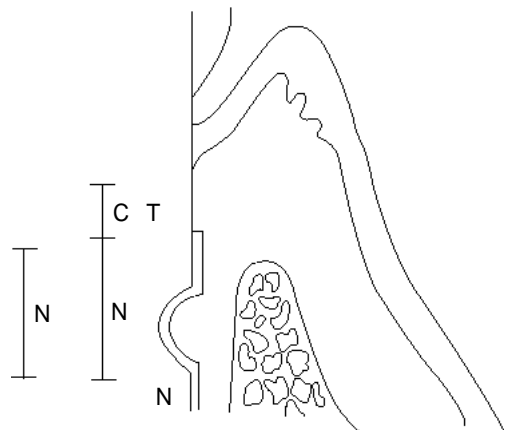
Gore - tex
 . 1
 2 Tetracyclin 100ml
 , 2% Chlorhexidine
 8
 (1, 2).

(3)

2.
 (1)
 , calcium sulfate I
 , calcium sulfate II
 50% III

10% formalin 10
 formic acid 2
 paraffin 5m 80m
 serial section
 hematoxylin - eosin

(2)
 Entobar ** 30mg/kg
 2%
 Lidocaine HCL
 Lactated Ringer 's solution
 . 2
 2 1
 3
 4mm, 가 4 mm
 1



NB: New bone N: Reference notch
 NC: New cementum CTA: Connective tissue
 1 Histometric Analysis

** Entobar, sodium pentobarbital 100mg/2ml,

Leitz - Laborlux II

(1) 1.05 ± 0.48mm,
0.97 ± 0.27mm,
1.13 ± 0.17mm

(4)

(CTA) , reference notch . Notch

(NC) , reference notch 3, 4).

(NB)

(1).

(2) I

5µm 1.30 ± 0.67mm,

80 µm serial section 1.45 ± 0.42mm,

4 1.78 ± 0.31mm

4 , Kruskal - Wallis

test

III.

1.

2 Histometric analysis

(unit: mm)

	Connective tissue adhesion		New Bone		New Cementum	
	Mean(± SD)	Median(range)	Mean(± SD)	Median(range)	Mean(± SD)	Median(range)
Control	1.05	0.48	0.97	0.27	1.13	0.17
	0.95	0.11	0.95	0.60	1.15	0.04
Group I	1.30	0.67	1.45	0.42	1.78	0.31*
	1.15	1.50	1.40	0.10	1.70	0.70
Group II	0.97	0.22	2.00	0.33*	2.17	0.38*
	0.90	0.50	2.00	0.80	2.15	0.80
Group III	0.93	0.15	1.88	0.34*	2.15	0.47*
	1.00	0.30	1.80	0.70	2.00	1.00

* : Statistically significant difference compared to Control group, P<0.05

5, 6).

(3) 2 가 , , 16),
 $0.97 \pm 0.22\text{mm}$, , .
 $2.00 \pm 0.33\text{mm}$, 가 가
 $2.17 \pm 0.38\text{mm}$, calcium , 가 가
sulfate , 가
가 . 가
, 가 가 . 6).

. 1970

(7, 8).

Mellonig

(4) 3 26). 1977 Nade 4)
 $0.93 \pm 0.15\text{mm}$,
 $1.88 \pm 0.34\text{mm}$,
 $2.15 \pm 0.47\text{mm}$, 가

Urist 8, 27)

(9, 10).

IV.

BMP

가

BMP

. 1984 Mellonig¹³⁾ Shapoff⁵⁾
가 250 - 1000m
가 .

1975

가

Libin 9)

가

, Pearson 15), Mellonig 14), 28),
29)

. 1985 West ³⁰⁾ 2
가 가 . 1965
1979 Oikarinen ³¹⁾ Radentz Collings²⁰⁾
calcium sulfate 5 가
2 calcium
sulfate가 가
. 1970
Narang ³²⁾ 8 Haversian canal Bier³⁴⁾ ,
3 - 5
가 8 - 10 가
Calcium sulfate
8 calcium
sulfate
. 1971
Shaffer App²¹⁾ calcium sulfate가
calcium sulfate
notch 가
. 1987 Frame
¹⁶⁾ calcium sulfate hydroxyapatite
Calcium sulfate 1892 calcium sulfate가
hydroxyapatite
, 30 , 1988 Yamazaki ²²⁾
BMP 가
. Peltier Orn³³⁾ 가 calcium sulfate
calcium sulfate block 가 calcium sulfate
가
, 1959 Peltier¹⁸⁾ 5
가 가 , 2
Ca⁺² 가 가 가
. 1963 Calhoun ¹⁹⁾
calcium
sulfate 120 . Yamazaki BMP

BMP calcium sulfate 36)
 Calcium sulfate
 BMP calcium sulfate
 BMP calcium sulfate
 calcium sulfate가
 Ca²⁺ 29), 37), 38)
 가 1
 가 3 1
 가
 가 calcium sulfate 5:5
 가 Sottosanti²³⁻²⁵ calcium sulfate가
 calcium sulfate
 (barrier)
 calcium sulfate 8 V.
 1
 calcium sulfate
 가 4mm
 , 4mm 1
 13) calcium sulfate I
 35, 36) calcium sulfate II ,
 가 III
 가 8
 . Klinge³⁵ Wikesj

1. 1.05 ±
0.48mm, I 1.30 ± 0.67mm,
II 0.97 ± 0.22mm, III
0.93 ± 0.15mm

2. 0.97 ±
0.27mm, I 1.45 ± 0.42mm,
II 2.00 ± 0.33mm, III
1.88 ± 0.34mm

I 가
, II
III 가 가
(P<0.05).
가

3. 1.13 ±
0.17mm, I 1.78 ± 0.31mm,
II 2.17 ± 0.38mm, III
2.15 ± 0.47mm

가가 (P<0.05).
가

1
calcium sulfate

VI.

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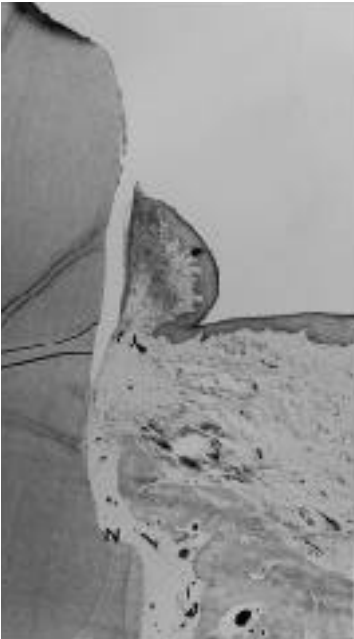
(I)



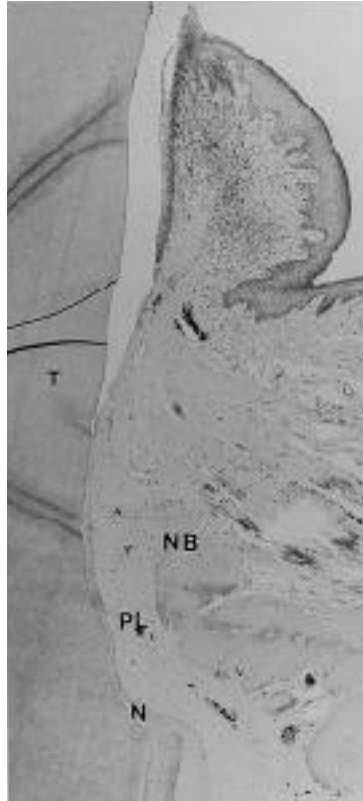
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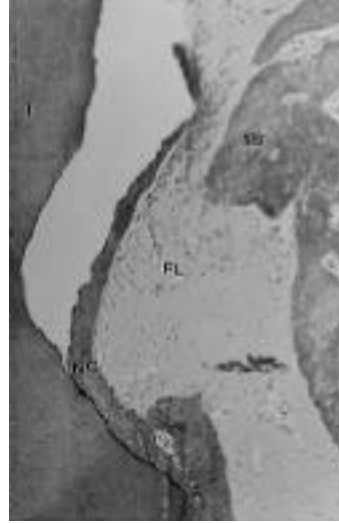


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(II)



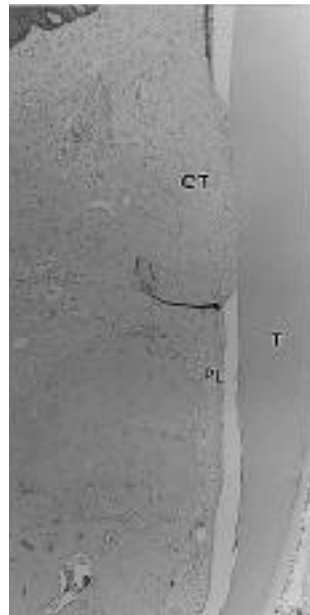
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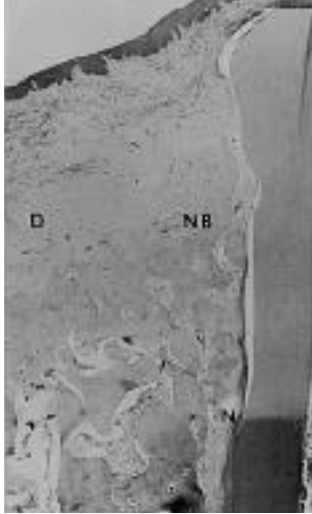


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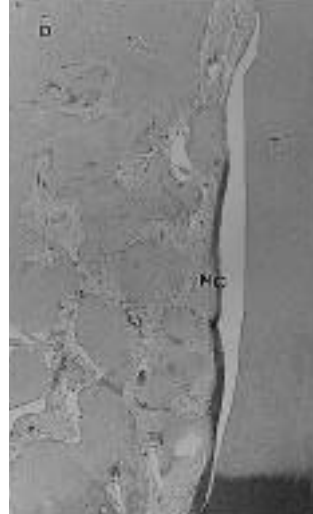


8

(III)



9



10

- 2 Calcium sulfate
- 3 (H - E, x 10)
notch
- 4 (H - E, x 40)
- 5 I (H - E, x 40)
notch
- 6 I (H - E, x 100)
Notch
- 7 II (H - E, x 10)
2 notch
- 8 II (H - E, x 40)
- 9 III (H - E, x 10)
3
- 10 III (H - E, x 40)
Notch

NB : , NC : , CT : , N: reference notch
PL: , D:DFDB, T:

- Abstract -

The effects of composit grafts of
allogenic
decalcified freeze Dried bone and
calcium sulfate on
the healing of 1-wall intrabony
defects in dogs

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Cho, Jung - Kiu Chai
Department of Periodontology, College of
Dentistry, Yonsei University

The present study evaluates the effects of calcium sulfate and DFDB on alveolar bone regeneration and cementum formation and connective tissue adhesion in intrabony angulated 1 wall defects of dogs. Four millimeter - deep angulated one - wall intrabony defects were surgically created in the mesial & distal aspects of premolars and with flap operation alone (control group), with calcium sulfate (experimental group 1), with composit graft of 50% calcium sulfate and 50% DFDB (experimental group 2), with DFDB alone (experimental group 3). Histologic analysis following 8 weeks of healing revealed the following results:

1. The lengths of connective tissue adhesion was 1.05 ± 0.48 mm in the control, 1.30 ± 0.67 mm in the test group I, 0.97 ± 0.22 mm in the test

group II and 0.93 ± 0.15 mm in the test group III. There was no statistical significance between control and all experimental groups.

2. Changes in alveolar bone level was 0.97 ± 0.27 mm in the control group, 1.45 ± 0.42 mm in the test group I, 2.00 ± 0.33 mm in the test group II, 1.88 ± 0.34 mm in the test group III. There was no statistically significant difference between control and experimental group I. There was a statistically significant difference between the control and experimental group II, III. ($p < 0.05$). There was no statistically significant difference between all experimental group.

3. Cementum formation was 1.13 ± 0.17 mm in the control, 1.78 ± 0.31 mm in the test group I, 2.17 ± 0.38 mm in the test group II, 2.15 ± 0.47 mm in the test group III with statistically significant differences between control group and all experimental group ($P < 0.05$). There was no statistically significant differences between all experimental group.

These results suggest that the use of composit graft of 50% calcium sulfate and 50% DFDB and DFDB alone in angulated 1 wall intrabony defects has little effects on connective tissue adhesion, but has significant effects on new bone and new cementum formations.

Key words : regeneration of periodontal tissue, bone graft, calcium sulfate, DFDB, infrabony defect, cementum, alveolar bone.