

성견 일벽성 치주 결손부에 이식한 biphasic calcium phosphate의 조직계측학적 평가

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Histometrical evaluation of biphasic calcium phosphate in surgically created 1-wall periodontal intrabony defects in dogs

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ABSTRACT

Purpose: The aim of this study was to evaluate biphasic calcium phosphate applied in surgically created 1-wall periodontal intrabony defects in dogs by histometrical analysis.

Material and Method: Critical sized(4 mm × 4 mm), one wall periodontal intrabony defects were surgically produced at the proximal aspect of mandibular premolars in either right and left jaw quadrants in four canines. The control group was treated with debridement alone, and experimental group was treated with debridement and biphasic calcium phosphate application. The healing processes were histologically and histometrically observed after 8 weeks.

Results: In biphasic calcium phosphate group, more new bone and cementum formation, less epithelium and connective tissue attachment were observed compared to other groups. But there was no statistical significance.

Conclusion: Though the statistically significant difference could not be found, it seemed that there was more new bone and cementum formation with applying biphasic calcium phosphate in 1 wall intrabony defects in dogs by preventing junctional epithelium migration. (*J Korean Acad Periodontol 2008;38:171-178*)

KEY WORDS: biphasic calcium phosphate, alloplastic materials, 1-wall defect.

4), 5), 6,7)

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1-3),

8).

가 , , ,

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9).

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16,21,22)

10,11)

가 ,
 . non-porous hydrox-
 yapatite, hydroxyapatite cement, porous hydrox-
 yapatite, beta-tricalcium phosphate, PMMA HEMA
 polymer, bioactive glass 가
 . Porous non-porous hydroxyapatite, PMMA
 HEMA polymer , -tricalcium
 phosphate bioactive glass . 가
 hydroxyapatite, calcium phosphate, calcium carbonate,
 calcium sulfate

12-14)

가
 , (scaffold) ,

15)

Hydroxyapatite beta-tricalcium phosphate(-TCP)

가 16) . -TCP

17)

가 . Hydroxyapatite

4

18)

-TCP가

12 , 6~8

19,20)

Hydroxyapatite 가 가

(filler) , 가
 . hydroxyapatite 가

phate ,
 가 tricalcium phos-

가 21,22)

yapatite hydrox-
 tricalcium phosphate

Biphasic calcium phosphate
 hydroxyapatite(HA) -tricalcium phosphate(
 -TCP)

HA가 ,
 -TCP가 77%
 . 3 300~500 μm

1 2, 3

23)

1 biphasic calcium phosphate
 가 .

biphasic calcium phosphate

가 가

1.

12 , 15 kg 4
 (Mongrel Dog)

(Prescription Diet Canine i/d,
 Hill's Pet Nutrition, Inc. USA)

biphasic calcium phos-
 phate(OSTEON, Genoss, Korea) 가 500

μm~1000 μm , hydroxyapatite -tricalcium phos-
 phate가 70:30 . 300 μm~500 μm

3 77%

2.
(1) 2 4 biphasic calcium phosphate

(2) Atropin(0.04 mg/kg; Kwangmyung Pharmaceutical Ind. Co. Ltd., Seoul, Korea) (IV), xylazine (Rompun, Bayer Korea Co., Seoul, Korea) ketamin (Ketara, Yuhan Co., Seoul, Korea)

(Gerolan, Choongwae Pharmaceutical Co., Seoul, Korea) lidocaine(2% , 1.8 mm, Yuhan Co., Seoul, Korea)

3 8 CEJ 4 mm 4 mm 가 2 4 4 mm (reference point) ¼ round bur biphasic calcium phosphate

(Vicryl 5.0 Polyglactin 910, Ethicon. Johnson & Johnson)

(3) 8 Sodium pentobarbital

block section

10% buffered formalin 10
5% nitric acid 2
paraffin
4 µm
, 80 µm

Hematoxylin-Eosin
(Olympus Multi-view microscope BH2 Japan)
(Image-Pro Plus™, Media Cybernetic, Silver Springs, MD, USA)

(Fig. 1).

- (defect height): (notch) - (CEJ)
- (Bone regeneration): (cementum regeneration): (epithelial attachment): CEJ
- (connective tissue attachment):

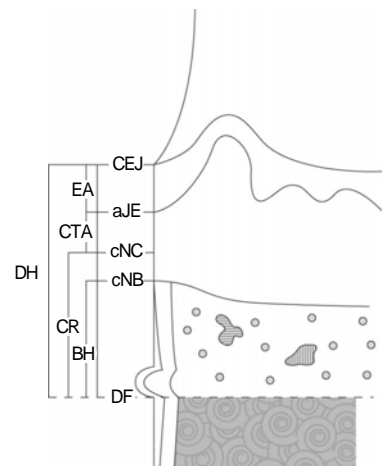


Figure 1. Schematic diagram depicting the landmarks and parameters used in the histometric analysis. CEJ : cemento-enamel junction, aJE : apical extent of junctional epithelium, cNC : coronal extent of newly formed cementum, cNB : coronal extent of newly formed bone, DF : defect floor, EA : epithelial attachment, CTA : connective tissue attachment, BH : bone height, CR : cementum regeneration, DH : defect height.

(4)

(SPSS 12.0, SPSS Inc., Chicago, IL, USA)

Mann-Whitney U test

0.05

1.

2.

(1) ()

(2) (biphasic calcium phosphate)

biphasic calcium phosphate

(woven bone)

가

biphasic cal -



Figure 2. Control 8 weeks(×40, H-E).

cium phosphate

calcium phosphate

(osteoid)

biphasic calcium phos -

phate

(Fig. 2, 3).

3.

Table 1

(±)

3.77±0.34 mm, 4.70±0.62 mm

(p

=0.309).

1.40±0.72

0.94±0.66

(p=0.773).

1.63±

0.54

0.79±0.65

(p=0.149).

1.30±0.55,

1.65±0.21

(p=0.386).

0.65±0.29,

1.83±1.27

(p=0.149).

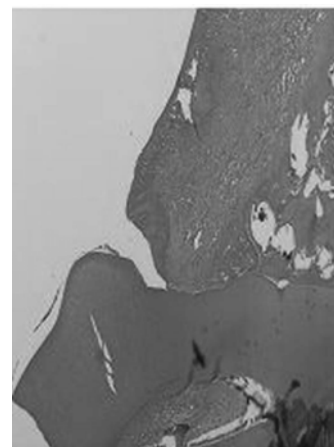


Figure 3. Biphasic calcium phosphate 8 weeks(×40, H-E).

22) (trabecular bone) . Nery hy - droxyapatite(HA) tricalcium phosphate(TCP) biphasic calcium phosphate , HA가 2.3±0.5 mm, 2.8±0.5 mm . 3 43~66%, 60~71% , 1 (12,36) . 가

16) phosphate 7:3(HA:TCP) , biphasic calcium phosphate가 , (dehiscence defect) 37) . Calcium phosphate chitosan membrane 38) 가 2, 3 가

biphasic calcium phosphate 가 1 calcium phosphate (32.92%) 가(49.16~52.26%) 33-35) . biphasic calcium phosphate 2, 3 가

biphasic cal- cium phosphate 가 osteoid 가 . Kim 28) 1, 2, 3 1.5±0.5 mm, 1.2±0.6 mm , 3

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