

## Contents

	Page
บทคัดย่อ	(3)
Abstract	(4)
Acknowledgement	(5)
Contents	(6)
List of Tables	(7)
List of Figures	(8)
Chapter	
1.Introduction	
Introduction	1
Review of literature	6
Aim of the study	31
2.Material and method	
Material	32
Method	36
3.Result	
Clinical evaluation	48
Gross morphological evaluation	48
Radiographic evaluation	50
Radiomorphometry analysis	52
Histologic evaluation	54
Histomorphometry analysis	59
Platelet measurement	61
4.Discussion	62
5.Conclusion	72
Bibliography	73
Vitae	86

## List of Tables

Table	page
1. Show the data of radiomorphometric (Bone density) in group 1, group 2, group 3, respectively.	53
2. Show the data of histomorphometric (% Bone area) in group 1, group 2, group 3, respectively.	60
3. Show the data of whole blood and PRP platelet counts of the rabbits.	61

## List of Figures

Figure	page
1. A. Commercial package of Bio-Oss <sup>®</sup> .	6
B. Bio-Oss <sup>®</sup> particle.	6
2. Scanning electron micrograph of Bio-Oss <sup>®</sup> cancellous structure.	7
3. A. Platelet rich plasma (PRP) is a source of growth factor to support bone and soft tissue healing.	12
B. PRP smear was showed the greatly increased platelet density.	12
4. Platelet entrapped in the blood clot degranulate and released growth factors.	16
5. During the first 3 days of graft placement, capillaries begin entering the graft.	17
6. Completed revascularized of the graft is seen by day 14.	18
7. A. The PRP has been mixed with Bio-Oss <sup>®</sup> .	30
B. Thrombin and calcium chloride are then added to form a firm gelatinous mass in which the Bio-Oss <sup>®</sup> particles are embedded.	30
8. A. rabbit whole blood was collected form marginal ear vein.	32
B. 14 ml of rabbit whole blood/ACD-A solution in the laboratory tube.	32
9. SORVALL H-6000 A SWING BUCKET ROTOR was used for preparation of autologous PRP.	33
10. Sysmex K1000 was used for platelet count of the rabbit whole blood and autogenous PRP.	34

## List of Figures (continued)

Figure	page
11. The solution of 10% calcium chloride with 5000 units of bovine thrombin were used for activated PRP to form gel.	34
12. Bio-Oss particle (A and C), PRP (B), Whole blood (D) and thrombin (E) in Eppendorf tubes.	35
13. The rabbit was placed in supine position before anesthesia procedure.	36
14. The sagittal incision was made from nasal to occipital part of rabbit.	38
15. A. The gutta-percha marker were used to locate bone defect (arrow).	38
B. Bio-Oss/PRP particle (arrow) and Bio-Oss alone (arrow head) were placed into the bone defect.	39
16. A. Nambutal solution is pentobarbital that used for sacrifice the experimental rabbit.	40
B. The rabbit was sacrificed by marginal ear vein injection with Pentobarbital.	40
17. The specimen was harvested from rabbit cranium in group 3 (6 weeks).	41
18. Bone specimen and marker were attached to the periapical film.	42
19. The parallel film holder that developed from XCP.	43
20. Radiograph was taken with parallel technique.	43
21. Scanner machine (Scan Jet 4C/T) and computer with Digora analysis soft wear for radiomorphometry analysis.	44
22. After decalcification process, the each of bone specimen was divided to three pieces.	45

## List of Figures (continued)

Figure	page
23. The 5 $\mu\text{m}$ thickness of bone specimens were cut transversally through the experimental and control defect.	45
24. The personal computer, a digital camera (AxioCam MR) and KS 400 programm were used for histomorphometric analysis.	47
25. Specimen of rabbit calvarial 2 weeks specimens.	49
26. Specimen of rabbit calvarial 4 weeks specimens.	49
27. Specimen of rabbit calvarial 6 weeks specimens.	50
28. Radiograph taken at 2 weeks.	50
29. Radiograph taken at 4 weeks.	51
30. Radiograph taken at 6 weeks.	51
31. Histogram of the amount of radiopaque new bone with in the defect area at 2, 4 and 6 weeks after surgery.	53
32. A. Specimen from group1 at 2 weeks (experimental side), demonstrating dense fibrous tissue.	56
B. Specimen from group1 at 2 weeks (control side), demonstrating new bone apposed to Bio-Oss <sup>®</sup> particles.	56
33. A. Specimen from group2 at 4 weeks (experimental side), demonstrating slightly of new bone formation around the Bio-Oss <sup>®</sup> particles.	57
B. Specimen from group2 at 4 weeks (control side), demonstrating new bone apposed to Bio-Oss <sup>®</sup> particles.	57

## List of Figures (continued)

Figure	page
34. A. Specimen from group3 at 6 weeks (experimental side), demonstrating the increasing of new bone formation around the Bio-Oss <sup>®</sup> particles	58
B. Specimen from group3 at 6 weeks (control side), demonstrating more newly formed bone apposed to the Bio-Oss <sup>®</sup> particles.	58
35. The histomorphometric showed an increase in % bone area over time.	60