



COMPARATIVE EFFECTIVENESS OF BONE GRAFTING USING XENOGRAFT FREEZE-DRIED CORTICAL BOVINE, ALLOGRAFT FREEZE-DRIED CORTICAL NEW ZEALAND WHITE RABBIT, XENOGRAFT HYDROXYAPATITE BOVINE, AND XENOGRAFT DEMINERALIZED BONE MATRIX BOVINE IN BONE DEFECT OF FEMORAL DIAPHYSIS WHITE RABBIT EXPERIMENTAL STUDY *IN VIVO*

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ARTICLE INFO

Published: 26th August
2018
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KEYWORDS

Bone healing;
Freeze-dried xenograft;
Freeze-dried allograft;
Hydroxyapatite;
Xenograft;
Demineralized bone matrix;
Xenograft.

SUMMARY

Introduction: Bone defect still become a big challenge for an orthopaedic surgeon and usually needs bone graft and now a day it become the second common transplantation after blood transfusion. Autogenous bone graft become a gold standard in treating bone defect but it have some disadvantages and makes the surgeon to choose allograft or xenograft. But it might be have difficulty in corporation and rejection reaction. **Objective:** This study is to compare the effectiveness between freeze-dried xenograft, freeze-dried allograft, hydroxyapatite xenograft, and demineralized bone matrix xenograft as a bone graft in bone defect of white rabbit femoral diaphysis. **Material and Methods:** 30 White Rabbits New Zealand of 6-9 months age were assigned into 5 groups of 6 each (matched for age, sex and weight). Bone defect was made with diameter 2,5 mm until the medulla on femoral diaphysis. In the study group, bone defect was filled with xenograft freeze-dried cortical bovine, allograft freeze-dried cortical New Zealand White Rabbit, xenograft hydroxyapatite bovine, and xenograft demineralized bone matrix bovine. In control group, bone defect wasn't filled. Study and control group was sacrificed in first, second, and fourth weeks after implantation, 2 femurs for each week and each group. We evaluate Vascular Endothelial Growth Factor (VEGF) dan Immunoglobulin G with immunology, and histologically we evaluate microvascular, osteoblast, osteoclast, woven bone, and fibrous tissue. **Results:** VEGF, osteoblast, and woven bone higher in allograft freeze-dried cortical New Zealand White Rabbit with mean 5,6625 ($p<0,05$) and xenograft demineralized bone matrix Bovine with mean 5,2475 ($p<0,05$) group but the calcification of woven bone already seen at second weeks in xenograft demineralized bone matrix Bovine group that is signed with decrease of woven bone mean 4,685 ($p<0,05$) and decrease in fibrous tissue mean 41,07 ($p<0,05$). The Immunoglobulin G is elevated in control group and all study group but not significantly with $p = 0,07855$. **Conclusion:** This study demonstrates that bone healing process in xenograft demineralized bone matrix bovine group is more effective than in xenograft hydroxyapatite bovine group, allograft freeze-dried New Zealand white rabbit group, xenograft freeze-dried cortical bovine group, and control group. Besides that, there is no significant elevation of Immunoglobulin G in each group.