

ABSTRAK

**PERBANDINGAN EKSPRESI *OSTEOCALCIN* DAN
ALKALINE PHOSPHATASE PASCA APLIKASI KOMBINASI
DEMINERALIZED FREEZE DRIED BOVINE BONE XENOGRAFT -
BOVINE HYDROXYAPATITE DENGAN
FREEZE DRIED BOVINE BONE XENOGRAFT
PADA DEFEK TULANG MANDIBULA
(Penelitian Experimental Laboratorik *in vivo*
pada Defek Mandibula Kelinci)**

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Latar Belakang: Teknik rekonstruksi tulang selalu berkembang dalam rangka mewujudkan optimalisasi estetika dan fungsi. *Autogenous bone graft* merupakan *gold standard* dalam penatalaksanaan suatu defek tulang, namun dikarenakan adanya keterbatasan pengambilan dan morbiditas sisi donor menyebabkan ahli bedah menggunakan *xenograft bone grafting* sebagai alternatif. **Tujuan:** Membandingkan ekspresi osteocalcin dan alkaline phosphatase pada defek mandibula kelinci paska penanaman FDBX dan kombinasi DFDBX - BHA. **Metode:** Pembuatan defek bikortikal ukuran 10 mm pada angulus mandibula 45 ekor *New Zealand White Rabbit* dibagi menjadi 3 kelompok; kelompok kontrol, kelompok FDBX, dan kelompok kombinasi DFDBX - BHA. Dilakukan terminasi dalam 3 waktu pengamatan yaitu minggu ke-2, ke-4 dan ke-8. Hasil terminasi dilakukan dekalsifikasi dan pemeriksaan IHC menggunakan antibody monoklonal untuk melihat ekspresi osteocalcin dan alkaline phosphatase. **Hasil:** Ekspresi Osteocalcin pada kelompok kombinasi DFDBX - BHA lebih tinggi dibandingkan dengan kelompok FDBX, tetapi tidak terdapat perbedaan signifikan (p value = 0,05). Ekspresi alkaline phosphatase kelompok kombinasi DFDBX - BHA didapatkan lebih tinggi dibandingkan kelompok lain, dan memiliki perbedaan bermakna dengan kelompok FDBX minggu ke-8 (p value < 0,05). **Kesimpulan:** Kombinasi DFDBX - BHA memiliki potensi meningkatkan ekspresi alkaline phosphatase lebih efektif dibandingkan dengan FDBX. Ekspresi alkaline phosphatase menunjukkan adanya proses pembentukan tulang pasca *bone grafting*.

Kata Kunci: *Demineralized Freeze-Dried Bovine Bone Xenograft, Bovine Bone Hydroxyapatite, Freeze-Dried Bovine Bone Xenograft,*, osteocalcin, alkaline phosphatas

ABSTRACT

Comparisons of Osteocalcin and Alkaline Phosphatase Expressions After Application of Mixture of Demineralized Freeze Dried Bovine Bone Xenograft - Bovine Bone Hydroxyapatite and Freeze Dried Bovine Bone Xenograft in Mandibular Bone Defect (In vivo Laboratory Experimental Study on New Zealand Rabbit Mandibular Defect)

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Introduction : Bone reconstruction techniques have been advanced in order to optimize functions and esthetic outcome. Autogenous bone graft is the gold standard for bone defects treatment, however due to their limitation and the donor site morbidity may caused many surgeons use a xenograft type of bone grafting to cope the problem. ***Objective*** : The aim of this study is observed the difference of expressions of osteocalcin and alkaline phosphatase after bone grafting between FDBBX application and mixture of DFDBBX and BHA application. ***Materials and Methods*** : Bicortical 10 mm sized bone defects were created in the right mandibular angle of 45 New Zealand White Rabbits. The samples were divided into 3 groups, in Group 1, the defect were grafted with mixture of DFDBBX and BHA, in Group 2, the defect were grafted with FDBBX and Group 3 as control groups were left perforated. All groups were terminated in three observation times, 2nd week, 4th week, and 8th week, then were being decalcified and observed by immunohistochemistry procedure using monoclonal antibody to count expression of alkaline phosphatase and osteocalcin. ***Results*** : The result of osteocalcin expression showed that mixture of DFDBBX and BHA groups have higher amounts than FDBBX groups with no significant difference of mean ($p > 0,05$). The result of osteocalcin expression showed that mixture of DFDBBX and BHA groups have higher amounts than FDBBX groups with a significant difference of mean ($p < 0,05$) in eighth week. ***Conclusion*** : Mixture of DFDBBX and BHA groups showed effectiveness in enhancing expressions of alkaline phosphatase comparing to FDBBX groups. It is assumed that the amounts of alkaline phosphatase expressions showed bone formation phase after bone grafting.

Keywords: Demineralized Freeze-Dried Bovine Bone Xenograft, Bovine Bone Hydroxyapatite, Freeze-Dried Bovine Bone Xenograft, osteocalcin and alkaline phosphatase