Regeneration of Massive Bone Defect with Bovine Hydroxyapatite as Scaffold of Mesenchymal Stem Cells

Abstrak:

Massive bone defect caused by various diseases and disorders, until now is still a major problem in the field of Orthopedics and Traumatology, because if not handled properly can cause permanent disability in patients. Massive bone defect reconstruction need big graft size, and the ideal graft must have characteristics of osteoconductive, osteoinductive, and osteogenesis. This study aimed to prove that there will be bone regeneration process take place in massive bone defect which being treated with bovine hydroxyapatite as scaffold of mesenchymal stem cells. This was a post test only control group design study. Experimental unit was male New Zealand white rabbit, which in this research will be underwent cutting of ulna osteoperiosteal as critical sized bone defect, then reconstruction was performed using a bovine hydroxyapatite (control group) and composite of bovine hydroxyapatite with mesenchymal stem cells. After 8 weeks, the reconstructed ulna has been were taken and being analyzed. Analysis results from control and treatment group were: no difference on radiological examination (p = 0.133), histopathological examination showed difference in total matrix formed (p = 0.00), difference in union distal and proximal (p = 0.000 and p = 0.015), matrix in graft also showed to be different (p = 0.000), difference in bone matrix (p = 0.010). Immunohistochemistry examination showed difference in collagen type I and osteocalcin (p = 0.000 and p = 0.049). Correlation was found between collagen type I bone matrix (p = 0.039 dan p = 0.049). Multivariate analysis showed correlation between osteoblast product and massive bone defect regeneration (p = 0.797). The conclusion of this research was regeneration occur in the reconstruction of massive bone defects using a composite graft of bovine hydroxyapatite with mesenchymal stem cells.

Keyword:

Daftar Pustaka:

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