Penggunaan komposit membran (polivinilalkohol-kolagen-hidroksiapatit) pada regenerasi tulang mandibula hewan coba tikus Sprague-Dawley = Use of membrane composite (polivinilalcohol-colagen-hydroxyapatite) in mandibular bone regeneration of animal testing Sprague-Dawley rats

Yessy Ariesanti, author

Abstrak

[ABSTRAK
Latar Belakang: Kebutuhan bahan pengganti tulang pada bidang bedah mulut dan maksilofasial semakin meningkat. Metode guided bone regeneration (GBR) yaitu suatu metode penambahan volume tulang dengan memungkinkan terjadinya pertumbuhan jaringan tulang yang selektif dalam suatu ruang, dimana pertumbuhan sel-sel tulang tersebut dijaga oleh suatu bahan (membran). Berkembangnya bahan biokomposit yang diketahui secara fakta bahwa pada penggunaan satu bahan saja tidak dapat digunakan untuk memenuhi seluruh kebutuhan pada penggunaan bahan implan pada biomedikal. Pada penelitian ini dibuat suatu komposit membran yang terdiri dari perpaduan bahan polivinilalkohol (PVA) + kolagen + hidroksiapatit. Kompositmembran (PVA-Kolagen-HA) diaplikasikan pada defek mandibular tikus Sprague-Dawley. Tujuan: Mengkaji penggunaan komposit membran (PVA-Kolagen- Hidroksiapatit) dalam regenerasi defek tulang mandibula pada hewan coba tikus perlakuan dibandingkan dengan hewan coba tikus kontrol dengan menilai sel osteoblas, sel radang dan angiogenesis.Metode Penelitian: 40 ekor tikus jantan jenis Sprague-Dawley usia 8-10 minggu dengan berat badan rata-rata 225 ± 25 gram. Tikus dibagi atas kelompok kontrol dan kelompok perlakuan dengan masing-masing berjumlah 20 ekor tikus. Dilakukan pembuatan defek pada angulus mandibular kiri tikus. Pada tikus kontrol tidak diaplikasi dengan komposit membran sedangkan pada kelompok perlakuan diaplikasi dengan komposit membran (PVA-Kolagen-HA). Kelompok kontrol dan kelompok perlakuan dengan komposit membran diamati sel osteoblas, sel radang dan angiogenesis melalui preparat histopatologi pada interval waktu hari ke-3, hari ke-7, hari ke-10, hari ke-14 dan hari ke-21. Hasil: Terdapat perbedaan bermakna (p<0,01) terhadap jumlah sel osteoblas, jumlah sel radang dan angiogenesis antara kelompok kontrol dan kelompok perlakuan dengan komposit membran (PVA-Kolagen-Hidroksiapatit). Terdapat perbedaan bermakna (p<0,01) antara jumlah sel osteoblas, jumlah sel radang dan angiogenesis terhadap interval waktu (3 hari, 7 hari, 10 hari, 14 hari dan 21 hari). Kesimpulan: Penggunaan komposit membran (PVA-Kolagen-Hidroksiapatit) mempercepat regenerasi tulang mandibular pada hewan coba tikus Sprague?Dawley.
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ABSTRACT
Background: The need of alternative bone substance in oral and maxillofacial surgery has increased. Guided bone regeneration method (GBR) is one of bone adding volume method by making the bone tissue regeneration to occur selectively in a room where the growth of bone cells are protected by a particular substance (membrane). It has been known that the developing biocomposite substance is cannot be achieved from only a single substance to recover all the requirements needed in the use of biomedic implant. In this study, a composite membrane consist of combination of polivinilalcohol material (PVA) + collagen +

hydroxyapatite was made. Composite membrane applied on the mandibular defect of Sprague-Dawley rats. Objective: To evaluate the use of compocite membrane (PVA-Collagen-Hydroxyapatite) for regeneration of mandibular defect in animal testing (rats) comparing with group control of animal testing by observing the osteoblas, membrane (PVA-Collagen-HA) applied only in rats of testing group. The appearance of osteoblasts, inflammation cells, and angiogenesis were evaluated histopathologically on interval of 3rd, 7th, 10th, 14th and 21st day after application of composite membrane. Result: There are significant differences ($p<0,01$) in the number of osteoblast cells, inflammation cells and angiogenesis between the control group and the group applied with composite membrane (PVA-Collagen-Hydroxyapatite) on interval of determined days (day 3, day 7, day 10, day 14 and day 21st). Conclusion: Use of composite membrane (PVA-Collagen-Hydroxy) accelerates the mandibular bone regeneration of animal testing Sprague-Dawley rats.;Background: The need of alternative bone substance in oral and maxillofacial surgery has increased. There are many ways can be done to add bone volume.
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Objective: To evaluate the use of compocite membrane (PVA-CollagenHydroxyapatite)

for regeneration of mandibular defect in animal testing (rats)
comparing with group control of animal testing by observing the osteoblas,
inflammation cells and angiogenesis.
Method: 40 male Sprague-Dawley rats aged 8-10 months with weight of
approximately 225 ± 25 grams were divided into two groups. First twenty rats were
treated as control group and another twenty rats for testing group. Defecation on
left angulus mandibula was done for all groups and composite membrane (PVACollagen-HA)
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