"LET US TRANSLATE RESEARCH TOWARDS ORTHOPEDICS"



EUROPEAN ORTHOPAEDIC RESEARCH SOCIETY 28TH ANNUAL MEETING CONGRESS BOOK

SEPTEMBER
17 - 18 2020
İZMİR




"Let us Translate Research Towards Orthopedics"

European Orthopaedic Research Society 28th Annual Meeting Congress Book




28th Annual Meeting

İzmir

September 17 – 18 2020

Tasarım
Karınca Creative Ajans

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ISBN : 978-605-9642-70-5

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Infection

Status / Accept Type : Accepted - Oral Presentation

Abstract Referance : 61

THE EFFECT OF ANTIBIOTIC ON STRUCTURAL ALLOGRAFT HEALING OF BONE DEFECT

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Introduction. Cancellous and cortical bone used as a delivery vehicle for antibiotics. Recent studies with cancellous bone as an antibiotic carrier in vitro and in vivo showed high initial peak concentrations of antibiotics in the surrounding medium. However, high concentrations of antibiotics can substantially reduce osteoblast replication and even cause cell death.

Objectives. To determine whether impregnation with gentamycine impair the incorporation of bone allografts, as compared to allografts without antibiotic.

Materials and method. Seventy two healthy rabbits (24 rabbits in each group) were used for this study. Bone defects (3-mm diameter, 10-mm depth) were created in the femur. Human femoral head prepared according to the Marburg bone bank system was used as bone allograft. In the experimental groups, in 1 group - the defects were filled with bone allografts, in 2 group – Perforated Gentamycin-impregnated bone allografts. The control group did not receive any filling. The animals were killed after 14, 30 and 60 days. Evaluations consisted of X-ray plain radiography, histology at 14-, 30- and 60-days post-surgery.

Results. Active osteoblast activity and active formation of new bones were detected around the defect area in all groups, but the amount of new bone formation was greater in the experimental groups than the control group. We found no statistically significant differences in the rate of bone formation between 1 and 2 groups at 14, 30 and 60 days in any of the parameters studied. X-ray results showed no significant difference in bony callus formation around allografts in 1 and 2 groups. In contrast, no significant callus formation was observed in the control group.

Conclusion. The use of gentamycin-impregnated bone allografts may be of value in procedures performed at the site of osteomyelitis which require a second stage reconstruction with impacted bone grafting techniques.

Keywords : bone defect, bone allograft, bone regeneration