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Use of native bovine bone morphogenetic protein extract in healing segmental tibial bone defects in goats

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New bone-forming activity of injectable native bovine BMP extracted from cadaveric bones obtained from the abattoir was tested after SDS gel electrophoresis to identify the molecular weights of the extract in the goat thigh muscle pouch model. The bio assayed proteins was further used to study the effects of bovine BMP in an absorbable collagen sponge (ACS)/hydroxyapatite implant on bone healing in a large animal tibia fracture model. Open tibial fractures were created in 20 adult goats with loss of 1.5 cm segment of the bone. A group (10 goats) were treated with an implant of the study device (0.2 mg of extracted bovine BMP/ACS/Hydroxyapatite) while the other group (10 goats) were treated with an implant of buffer/ACS/Hydroxyapatite. The devices were implanted as a mould in the segmental defects. The animals were monitored for callus formation which was measured on radiographs and mean callus indexes determined. Histomorphologic evaluation was also performed. Radiographs indicated increased callus, at 3 weeks in the extracted bovine BMP/ACS/Hydroxyapatite treated tibia. At 6 weeks, the extracted bovine BMP/ACS/Hydroxyapatite treated tibia had superior radiographic healing scores compared to the control group. The extracted bovine BMP/ACS/Hydroxyapatite treated tibiae produced significantly larger volume of callus ($p < 0.02$) compared to the buffer/ACS/Hydroxyapatite treated tibia. Total callus and new bone volume was significantly increased ($p < 0.02$) in the extracted bovine BMP/ACS/Hydroxyapatite treated tibia compared with buffer/ACS/Hydroxyapatite groups. Extracted bovine BMP/ACS/Hydroxyapatite altered the timing of onset of periosteal/endosteal callus formation compared to controls.

Biography

Uwagie Ero Edwin Aihanuwa has completed his PhD from University of Nigeria. He is a Senior Lecturer in the Department of Veterinary Surgery at the University of Benin, Nigeria. He has published papers in reputed journals. He is currently involved in research on the cellular mechanism involved in bone regeneration and repair.

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