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Tobramycin-impregnated calcium sulfate prevents infection in contaminated wounds

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Open fractures often are associated with increased rates of infection and nonunion, multiple surgical procedures, and delayed return to preinjury activity. Antimicrobial bone graft substitutes used as an alternative to antibiotic cement beads and/or delayed autologous bone grafting may provide a useful adjunct in patients with open fractures. A stable, unicortical defect was created and contaminated with 30 microL of 5×10^8 colony-forming units/mL of *Staphylococcus aureus* in the proximal tibial metaphysis of Spanish goats. The negative control group received no treatment, the carrier group received synthetic bone graft alone, the positive control group received tobramycin antibiotic cement, and the treatment group received tobramycin antimicrobial synthetic bone graft (calcium sulfate). After a 3-week evaluation period, intraosseous microbiologic specimens were obtained. The *Staphylococcus aureus* contaminant was recovered in 11 of 12 animals (mean = 6.9×10^8 colony-forming units/g marrow) in the negative control group and in all animals (mean = 2.2×10^8 colony-forming units/g marrow) in the carrier group. Bacteria were not found in the antibiotic-treated groups. The tobramycin-impregnated calcium sulfate was effective in preventing infection in a contaminated defect. It could be beneficial in reducing the number of surgeries and recovery time because it is bioabsorbable and osteoconductive.