

The use of an antibiotic-impregnated, osteoconductive, bioabsorbable bone substitute in the treatment of infected long bone defects: early results of a prospective trial.

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OBJECTIVE: We sought to evaluate the use of a bioabsorbable, tobramycin-impregnated bone graft substitute (calcium sulfate alpha-hemihydrate pellets) in the treatment of patients with infected bony defects and nonunions. **STUDY DESIGN/METHODS:** Twenty-five patients (15 male and 10 female, mean age 43 years (range 27-69 years) requiring surgical debridement of culture-positive long bone infection (16 with associated nonunion) were entered into an ongoing consecutive, prospective clinical trial. Involved bones included the tibia (15), femur (6), ulna (3), and humerus (1). All defects were posttraumatic in origin, and each patient had had previous surgery at the involved site (mean 4.3 surgeries; range 1-8 surgeries). The duration of infection ranged from 4 months to 20 years (mean 43 months). According to the Cierny-Mader classification system, there was 1 stage I (medullary osteomyelitis), 6 stage III (localized osteomyelitis), and 18 stage IV (diffuse osteomyelitis) lesions. There were 4 normal (A) hosts and 21 locally and/or systemically compromised (B) hosts. Mean bone defect/void was 30.5 cm (range 3-192 cm). **RESULTS:** Mean follow-up was 28 months (range 20-38 months). Radiographically, pellets were resorbed at a mean of 2.7 months postoperatively. Infection was eradicated in 23 of 25 patients (92%). Isolated bony defects healed in all nine patients without further treatment. Fourteen of 16 patients with nonunion achieved union, although nine required autogenous bone grafting. Union was achieved in five of seven nonunion patients treated with bone graft substitute in isolation. Complications included refracture (three), recurrence of infection (two), persistent nonunion (two), and superficial wound necrosis (one). Eight patients developed sterile draining sinuses that healed upon radiographic resorption of the pellets. **CONCLUSIONS:** In patients with posttraumatic osteomyelitis, the bone graft substitute was effective in eradicating bone infection in 23 of 25 patients. Isolated bony defects healed reliably (nine of nine) following addition of bone graft substitute alone. The role of the bone graft substitute in isolation in the treatment of nonunion is unclear at present.