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Treatment of nonunions and osseous defects with bone graft and calcium sulfate

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The treatment of long bone nonunions and fractures with osseous defects is challenging. The results of 26 patients with either a persistent long bone nonunion or an osseous defect after an open fracture were reviewed. Each patient was treated with debridement of devitalized tissue, open reduction and internal fixation, and bone grafting using a mixture of autogenous iliac crest bone graft and medical grade calcium sulfate. The current study evaluated the union rate and associated complications for treatment of these injuries using this protocol. Each nonunion was confirmed intraoperatively, and healing was determined clinically by the patients' return to full activities without pain and radiographically by the presence of bridging trabeculae. Complications included persistent nonunion (four patients), wound drainage (five patients), wound drainage and cellulitis (one patient) and cellulitis alone (one patient). Using this treatment protocol, 22 patients (85%) achieved healing after one surgery and an additional two patients (92%) achieved healing after a second surgery. Medical grade calcium sulfate increases the volume of graft material, facilitates bone formation, and is safe in the treatment of nonunions and fractures with osseous defects.