Injectable Synthetic Bone Graft Substitute (GeneX) in the Surgical Management of Benign Bone Tumours: Further Experience from a Tertiary Musculoskeletal Oncology Centre

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Abstract

Intralesional curettage of benign bone lesions commonly results in contained osseous voids that require augmentation to restore structural integrity and facilitate rehabilitation. GeneX (Biocomposites Ltd., Keele, UK) is an injectable, fully synthetic bone graft substitute composed of calcium sulfate and beta-tricalcium phosphate, offering osteoconductivity with predictable resorption, which may simplify postoperative surveillance compared with traditional grafts. Evidence supporting its use in benign bone tumours remains limited and is largely derived from small, heterogeneous series; therefore, we report further real-world experience from a tertiary musculoskeletal oncology centre. We retrospectively reviewed 21 consecutive patients (12 males, 9 females; mean age 36 years, range 14–75) who underwent intralesional curettage of benign bone tumours with GeneX grafting between April 2019 and May 2025. All cases were discussed at regional musculoskeletal oncology multidisciplinary team meetings following magnetic resonance imaging. The most common histological diagnoses were enchondroma and aneurysmal bone cyst, with a mean tumour diameter of 31 mm (range 10–58 mm). Primary outcome measures included radiographic graft incorporation or resorption, complications, restoration of function, and tumour recurrence. Radiographic graft resorption was demonstrated in 19 patients (90%) within 3–12 months, with earlier remodelling observed in smaller defects. In two patients, resorption could not be confirmed due to limited follow-up imaging and postoperative infection requiring graft removal and revision fixation, respectively. All patients ultimately returned to full weight bearing, most within 6 weeks. At a mean follow-up of 35 months (range 3–72), no tumour recurrences were observed and no patients were lost to follow-up. In this cohort, GeneX appeared to be a safe, effective, and practical option for managing contained defects following curettage of benign bone tumours, although confirmation in controlled comparative studies is warranted.