Cerament Bone Void Filler for Oncology Indications: Single Center Experience

Davis Hedbany[1], Sukrita Menon[1], Harlan Stock[1], James Aglio[1], Timothy A. Damron[1]
[1]SUNY Upstate Medical University, Syracuse, NY

Disclosures: TAD (BoneSupport, Scientific Advisory Board)

INTRODUCTION: Benign bone lesions or cysts are frequently managed by curettage and grafting with autograft, allograft, or synthetic filler. This study aims to investigate the outcomes of CERAMENT™|BONE VOID FILLER, a ceramic bone graft substitute, in patients following resection of benign bone lesions with respect to safety, efficacy, and radiographic incorporation. The objectives are to (a) evaluate complications and return to normal activity experienced during up to two-years follow-up, (b) quantify the rate of resorption and incorporation of this bone filler, and (c) assess radiographic markers of bone regeneration. We hypothesized that CERAMENT will be safe, efficacious, and exhibit favorable progressive but balanced resorption, incorporation, and bone healing over time.

METHODS: This retrospective comparative study included patients (n=78) treated by the senior author over a 6-year span (2017-2023) for benign osseous lesions or cysts (**Table 1**), utilizing curettage and grafting with CERAMENT™|BONE VOID FILLER. This study was approved by the Institutional Review Board. Pre-operative imaging was used to establish the location, type, and size of each lesion, while operative notes documented the measurements of the defect and the amount of bone filler used to fill the void. Post-operative imaging and notes were used to assess for post-operative complications and to measure the rate of graft incorporation and resorption and bone regeneration.

RESULTS SECTION: Patients were followed for an average of 12.7 months, during which five cyst recurrences were observed. Among these, three required re-operation, and one resulted in a post-surgical pathological fracture. No other complications occurred. Specifically, no fractures occurred during the early healing phase of the graft material in the absence of recurrence of the underlying bone lesion. At the 6-week and 3-month follow-up, partial but progressive graft resorption and incorporation of CERAMENT™|BONE VOID FILLER with bone healing was evident. By 3 months, 88% of patients achieved full-weight bearing status or restoration of normal function with release to full activity. Advanced or complete graft resorption and incorporation with bone healing were more frequent at 6-month (25%), 1-year (43%), and 2-year (75%) follow-ups (**Figure 1**). The most common radiographic abnormality was puddling of the bone filler (**Figure 2**), which was noted in 27% of patients at 6-weeks, persisting in 25% of these cases through 2-years. The pattern of incorporation was commonly centripetal through a zone of peripheral radiolucency. Radiographic evidence of filler in the soft tissues was noted early on but resolved over time without a clinical manifestation in this study population.

DISCUSSION: In this series, CERAMENT™|BONE VOID FILLER proved a safe and effective solution for the treatment of benign bone lesions without complications directly attributable to the filler. The synthetic bone filler demonstrated advanced or complete graft resorption and incorporation in nearly half of the patients within 1-year, with a majority demonstrating these outcomes at the 2-year follow-up. Although 10% of patients experienced lesion recurrence, this was felt to be independent of the graft material. Nearly all patients achieved full-weight bearing status within three months post-operation. Limitations include the small number of patients, use of plain X-ray evaluation in lieu of more quantitative means such as CT, and loss of patients to follow-up.

SIGNIFICANCE/CLINICAL RELEVANCE: The management of benign bone lesions in surgical practice has been investigated using various allografts and synthetic bone fillers. These findings support CERAMENT™|BONE VOID FILLER as a safe and effective option with a desirable profile of paced bone resorption and incorporation leading to bone healing in benign bone lesions.

IMAGES AND TABLES:

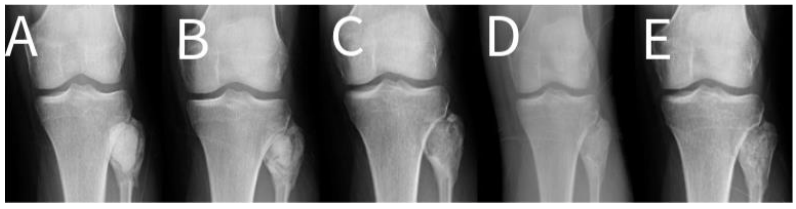

Figure 1: Post-operative x-rays after curettage and filling of proximal fibula using CERAMENT™|BONE VOID FILLER showing graft resorption and incorporation at **A)** 6-weeks, **B)** 4-months, **C)** 6-months, **D)** 1-year, and **E)** 2-years.

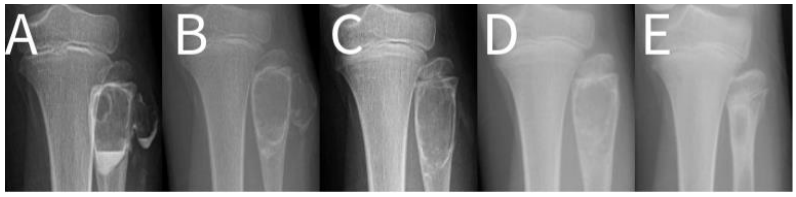

Figure 2: Post-operative x-rays after curettage and filling of proximal fibula using CERAMENT™|BONE VOID FILLER showing graft puddling within the bone and leakage into soft tissue at **A)** 6-weeks, followed by progressive to complete resorption and incorporation at **B)** 4-months, **C)** 6-months, **D)** 1-year, and **E)** 2-years.

Table 1: Benign Osseous Lesion Type

Lesion Type	Number (#)
Unicameral Bone Cyst	22
Enchondroma	12
Aneurysmal Bone Cyst	11
Non-Ossifying Fibroma	7
Fibrous Dysplasia	5
IO Ganglion	4
Bone Marrow	4
Subchondral Bone Cyst	2
Giant Cell Tumor	2
Benign Fibro-Osseous	2
Osteofibrous Dysplasia	1
Benign Fibrohistiocytic Lesion	1
Eosinophilic Granuloma	1
Chondroblastoma	1
Erdheim-Chester Disease	1
Chondromyxoid Fibroma	1
Gout Tophi	1
Osteomyelitis	1
Hyperplastic Synovium with Fibrosis	1
Hardware Removal	1