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CORR Insights®: Supplemental Bone Grafting in Giant Cell Tumor of the Extremity Reduces Nononcologic Complications

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Where Are We Now?

Existing outcomes studies on the treatment of giant cell tumor (GCT) of bone are largely retrospective, single institution case series [2–6]. Numerous treatment

options have been described, surgeon preferences vary, and studies provide conflicting results. Unfortunately, the heterogeneity in presentation of GCT of bone and number of tumor variables that can affect outcomes makes it difficult to compare the results of different treatment strategies. Important tumor and patient variables include age, anatomic location (both the bone involved and the proximity to the chondral surface), lesion size, amount of subchondral involvement, presence of pathologic fracture, degree of preexisting degenerative arthritis, BMI, and tumor biology. To compare treatment options, one must first try to account for these important variables. Key questions about therapy include whether to perform curettage versus resection, which adjuvant to use following curettage, whether to use bone graft versus polymethylmethacrylate (PMMA) following curettage, the appropriate bone graft selection, and whether to add bone

graft to the subchondral surface when using PMMA. Endpoints of interest include local recurrence, fracture, need for revision surgery, secondary osteoarthritis, and function. More recent treatment options including embolization, denosumab, and bisphosphonates further complicate the decision-making process.

The paper by Benevenia and colleagues does a nice job of attempting to answer the important question of whether supplemental bone grafting under the subchondral surface decreases complications following treatment of GCT of bone without an unacceptable increase in local recurrence. The study suggests that the risk of fracture and subsequent arthritis is lower among patients treated with supplemental subchondral bone grafting, and that this approach does not result in an increased risk of local recurrence.

While these findings should be taken with caution due to the limitations of the study, they do corroborate the findings reported by Ward and Li [6] indicating that subchondral grafting does not appear to increase the risk of local recurrence.

This CORR Insights® is a commentary on the article “Supplemental Bone Grafting in Giant Cell Tumor of the Extremity Reduces Nononcologic Complications” by Benevenia and colleagues available at: DOI: [10.1007/s11999-016-4755-x](https://doi.org/10.1007/s11999-016-4755-x).

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Where Do We Need To Go?

Taken in the context of what others have found, many other studies have shown a higher risk of local recurrence with bone graft alone versus PMMA. Because of these previous study findings [1–3], the current study is likely to assuage some of the concerns of musculoskeletal oncologists who have been performing subchondral bone grafting for GCT of bone in an effort to balance a desire to minimize nononcologic complications with concerns over local recurrence.

Determining the appropriate treatment options for GCT of bone will be challenging due to the large number of tumor and treatment variables. Future single-institution studies are likely to add modest incremental benefits to our current knowledge on GCT of bone. A larger, multiinstitutional retrospective study would have many of the same limitations of the existing literature regarding incomplete tumor and patient data, as well as heterogeneous treatment decision-making. Nevertheless, more patients in a combined study might allow for enough patients in the cohorts to provide enhanced understanding of the relevant tumor and treatment variables that impact outcome.

How Do We Get There?

A larger study might provide an opportunity to gain consensus and move forward with shared understanding of factors that more clearly lead to improved outcomes. A Musculoskeletal Tumor Society (MSTS) work group could then convene to design a multiinstitutional, multiarmed prospective study with an agreed-upon algorithm designed to answer specific controversial questions. A prospective study would add the benefit of patient-reported outcomes, and more importantly, would control the critical tumor and patient variables that confound and make comparison of the results of existing studies difficult.

The treatment of GCT of bone will need to continue to evolve, as new treatment options such as embolization and denosumab look promising and are likely to alter the landscape of GCT of bone management moving forward. As leaders in the musculoskeletal oncology field, the MSTS can both facilitate multiinstitutional studies to enhance our knowledge of these tumors, and serve as content experts who distill down the literature and formulate appropriate treatment pathways to continue to improve the care of this challenging patient population.

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