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CORR Insights®: Survival in Mesenchymal Chondrosarcoma Varies Based on Age and Tumor Location: A Survival Analysis of the SEER Database

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Where Are We Now?

The use of large databases has become ubiquitous in orthopaedic surgery, and reports from these sources have added substantially to our knowledge. With a variety of databases available for use in healthcare research, it is important to ensure that that the data source used is appropriate to address the proposed research question.

For an epidemiologic investigation about a rare tumor like mesenchymal chondrosarcoma, the Surveillance, Epidemiology, and End Results (SEER) Program Database is an ideal choice. SEER is population-based, meaning that all cases of cancer in a defined geographic population are reported. Therefore, estimations of tumor incidence and prevalence are reliable as the number of specific tumors can be compared to the known population of an area. This is in contrast to samples of convenience or administrative-claims data, where the population of the catchment area may be unknown. The primary limitations of SEER are the lack of treatment details (no reporting of systemic treatment, surgical approach, or margins) and the cancer status at any time after the initial diagnosis. Although the data on survival is of reportable quality, the clinical course and tumor burden (up until the point of death or censoring) is not recorded in the database.

With this in mind, we can interpret the reported findings about mesenchymal chondrosarcoma with an idea of the limitations of the dataset. The authors report new or additional information regarding presentation (accounting for 4% of all chondrosarcoma, 60% of which are extraskeletal), survival (51% at 5 years), and risk factors for diminished survival (presentation with metastatic disease and increasing size of the primary tumor). This study provides the clinician with important information about this tumor, including its presentation (it appears most commonly as a soft tissue mass) and its prognosis (most

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similar to high-grade conventional chondrosarcoma [1]).

Where Do We Need To Go?

The most interesting and puzzling finding in this report is the dramatic difference in survival, favoring young patients over older ones, specifically in cranial disease. Extremity and head and neck bone sarcomas commonly have a more favorable prognosis than axial tumors, partially explained by earlier detection, expeditious treatment, and fewer metastases at presentation [3]. It is neither clear, nor is it within the scope of this report, how or why survival in cranial mesenchymal chondrosarcoma is so age-dependent. In this, we find a limitation of database research, as there are no additional details available, such as local invasion precluding resection, use of adjuvant chemotherapy, adequacy of surgical margins, specific cause of death, or confirmatory histologic review. Differences between the groups in any of these variables could help explain the noted discrepancy, while equivalency in presentation and treatment would advocate for an underlying biologic variation. A major purpose of database investigation is to generate hypotheses for further research—this study is a compelling example of a finding with many possible explanations, allowing only for speculation as to the true reason.

How Do We Get There?

Every disease process is important to those who suffer and those who attempt to alleviate suffering. Ideally, we would have infinite resources to investigate all conditions that threaten our collective survival and quality of life. However, in reality, there are choices to be made. It took nearly 40 years for the most robust epidemiologic cancer database in the United States to gather a mere 205 cases of mesenchymal chondrosarcoma. Thus, it is impractical to consider a prospective, treatment-oriented clinical trial for this sarcoma subtype specifically. This investigation describes the nature of mesenchymal chondrosarcoma and provides information regarding its typical behavior and clinical course. But in order to develop a guide for treatment, we must use data sources that contain more treatment-specific variables, such as the American College of Surgeons' National Cancer Data Base [2], or by establishing a national sarcoma registry and allowing for years of maturation. Until that time, the current evidence is compelling enough for mesenchymal chondrosarcoma to be treated as a high-grade sarcoma in terms of patient counseling, surgical management, and long-term surveillance. Knowledge gaps regarding the use of adjuvant chemotherapy and radiation still remain, which are largely dependent on provider preference and individual clinical scenarios, and will likely continue for the foreseeable future.

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