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Clinical predictors of overall survival in pediatric patients with intramedullary spinal tumors: an analysis of the SEER database

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Abstract

Introduction: Intramedullary tumors account for 35-40% of all intraspacial tumors in pediatric patients. The gold standard of care remains aggressive surgical resection as these tumors are slow progressing in nature. Despite the significant body of literature on this pathology, little has been assessed regarding survival, outcomes, and surgical resection for pediatric patients with intramedullary tumors.

Methods: A retrospective analysis of 493 pediatric patients with intramedullary spinal tumors from the SEER database was performed. Patients were classified into three surgical groups: No Resection, Subtotal Resection (STR), and Gross Total Resection (GTR). Multivariable Cox proportional hazards models and Kaplan-Meier survival curves were utilized. Subgroup analyses were conducted for astrocytomas and ependymomas.

Results: Of 493 patients, 52 (10.5%) received no resection, 314 (63.7%) underwent STR, and 127 (25.8%) underwent GTR. Chemotherapy and radiotherapy use was highest in the STR group ($p = < 0.001$; $p = 0.004$, respectively). In the full cohort, neither STR nor GTR conferred a significant survival benefit. Chemotherapy (HR: 5.438; $p < 0.001$) and radiotherapy (HR: 3.538; $p < 0.001$) were associated with increased mortality. In the astrocytoma subgroup, extent of resection was not associated with survival benefit, and both chemotherapy (HR: 4.250; $p = < 0.001$) and radiotherapy (HR: 3.493; $p = < 0.001$) were associated with increased hazard. Conversely, in ependymoma patients, GTR significantly improved survival (HR: 0.050; $p = 0.015$), while radiotherapy did not (HR: 4.896; $p = 0.011$).

Conclusion: GTR was found to be beneficial for ependymoma patients. In the full cohort analysis, STR nor GTR were of significant survival benefit. Further prospective studies are warranted to better understand the landscape for this specific patient population.

Keywords: Astrocytoma; Chemotherapy; Disparities; Ependymoma; Gross total resection; Radiotherapy; Subtotal resection.

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