

ABSTRACT

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Perioperative outcomes and survival after surgery for intramedullary spinal cord tumors: a single-institution series of 302 patients.

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OBJECTIVE: Intramedullary spinal cord tumors (IMSCTs) are rare neoplasms whose treatment is often technically challenging. Given the low volume seen at most centers, perioperative outcomes have been reported infrequently. Here, the authors present the largest single-institution series of IMSCTs, focusing on the clinical presentation, histological makeup, perioperative outcomes, and long-term survival of surgically treated patients.

METHODS: A cohort of patients operated on for primary IMSCTs at a comprehensive cancer center between June 2002 and May 2020 was retrospectively identified. Data on patient demographics, tumor histology, neuraxial location, baseline neurological status, functional deficits, and operative characteristics were collected. Perioperative outcomes of interest included length of stay, postoperative complications, readmission, reoperation, and discharge disposition. Data were compared across tumor histologies using the Kruskal-Wallis H test, chi-square test, and Fisher exact test. Pairwise comparisons were conducted using Tukey's honest significant difference test, chi-square test, and Fisher exact test. Long-term survival was assessed across tumor categories and histological subtype using the log-rank test.

RESULTS: Three hundred two patients were included in the study (mean age 34.9 ± 19 years, 77% white, 57% male). The most common tumors were ependymomas (47%), astrocytomas (31%), and hemangioblastomas (11%). Ependymomas and hemangioblastomas disproportionately localized to the cervical cord (54% and 59%, respectively), whereas astrocytomas were distributed almost equally between the cervical cord (36%) and thoracic cord (38%). Clinical presentation, extent of functional dependence, and postoperative 30-day outcomes were largely independent of underlying tumor pathology, although tumors of the thoracic cord had worse American Spinal Injury Association (ASIA) grades than cervical tumors. Rates of gross-total resection were lower for astrocytomas than for ependymomas (54% vs 84%, $p < 0.01$) and hemangioblastomas (54% vs 100%, $p < 0.01$). Additionally, 30-day readmission rates were significantly higher for astrocytomas than ependymomas (14% vs 6%, $p = 0.02$). Overall survival was significantly affected by the underlying pathology, with astrocytomas having poorer associated prognoses (40% at 15 years) than ependymomas (81%) and hemangioblastomas (66%; $p < 0.01$) and patients with high-grade ependymomas and

astrocytomas having poorer long-term survival than those with low-grade lesions ($p < 0.01$).

CONCLUSIONS: The neuraxial location of IMSCTs, extent of resection, and postoperative survival differed significantly across tumor pathologies. However, perioperative outcomes did not vary significantly across tumor cohorts, suggesting that operative details, rather than pathology, may have a stronger influence on the short-term clinical course, whereas pathology appears to have a stronger impact on long-term survival.

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