

J Neurosurg Spine. 2023 Oct 13;1-10. doi: 10.3171/2023.8.SPINE23190. Online ahead of print.

Treatment of intramedullary spinal cord tumors: a modified Delphi technique of the North American Spine Society Section of Spine Oncology

Andrew M Hersh¹, Zach Pennington², Daniel Lubelski¹, Aladine A Elsamadicy³, Nicolas Dea⁴, Atman Desai⁵, Ziya L Gokaslan⁶, C Rory Goodwin⁷, Wesley Hsu⁸, George I Jallo⁹, Ajit Krishnaney¹⁰, Ilya Laufer¹¹, Sheng-Fu Larry Lo¹², Mohamed Macki¹³, Ankit I Mehta¹⁴, Ali Ozturk¹⁵, John H Shin¹⁶, Hesham Soliman¹², Daniel M Sciubba^{1 12}

Affiliations

PMID: 37856379 DOI: [10.3171/2023.8.SPINE23190](https://doi.org/10.3171/2023.8.SPINE23190)

Abstract

Objective: Intramedullary spinal cord tumors (IMSCTs) are rare tumors with heterogeneous presentations and natural histories that complicate their management. Standardized guidelines are lacking on when to surgically intervene and the appropriate aggressiveness of resection, especially given the risk of new neurological deficits following resection of infiltrative tumors. Here, the authors present the results of a modified Delphi method using input from surgeons experienced with IMSCT removal to construct a framework for the operative management of IMSCTs based on the clinical, radiographic, and tumor-specific characteristics.

Methods: A modified Delphi technique was conducted using a group of 14 neurosurgeons experienced in IMSCT resection. Three rounds of written correspondence, surveys, and videoconferencing were carried out. Participants were queried about clinical and radiographic criteria used to determine operative candidacy and guide decision-making. Members then completed a final survey indicating their choice of observation or surgery, choice of resection strategy, and decision to perform duraplasty, in response to a set of patient- and tumor-specific characteristics. Consensus was defined as $\geq 80\%$ agreement, while responses with 70%-79% agreement were defined as agreement.

Results: Thirty-six total characteristics were assessed. There was consensus favoring surgical intervention for patients with new-onset myelopathy (86% agreement), chronic myelopathy (86%), or progression from mild to disabling numbness (86%), but disagreement for patients with mild numbness or chronic paraplegia. Age was not a determinant of operative candidacy except among frail patients, who were deemed more suitable for observation (93%). Well-circumscribed (93%) or posteriorly located tumors reaching the surface (86%) were consensus surgical lesions, and participants agreed that the presence of syringomyelia (71%) and peritumoral T2 signal change (79%) were favorable indications for surgery. There was consensus that complete loss of transcranial motor evoked potentials with a 50% decrease in the D-wave amplitude should halt further resection (93%). Preoperative symptoms seldom influenced choice of resection strategy, while a distinct cleavage plane (100%) or visible tumor-cord margins (100%) strongly favored gross-total resection.

Conclusions: The authors present a modified Delphi technique highlighting areas of consensus and agreement regarding surgical management of IMSCTs. Although not intended as a substitute for individual clinical decision-making, the results can help guide care of these patients. Additionally, areas of controversy meriting further investigation are highlighted.

Keywords: astrocytoma; ependymoma; guidelines; intramedullary spinal cord tumor; neuro-oncology; oncology; spine; tumor.