

J Neurosurg Spine. 2024 Sep 20:1-9. doi: 10.3171/2024.5.SPINE24457. Online ahead of print.

# Optimal treatment strategy for low-grade spinal cord astrocytoma: a retrospective, multicenter analysis by the Neurospinal Society of Japan

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PMID: 39303310 DOI: 10.3171/2024.5.SPINE24457

## Abstract

**Objective:** Primary spinal cord gliomas are rare, and among these astrocytomas (WHO grade II) are much rarer. The optimal treatment strategy thus remains unclear. The authors conducted a multicenter study led by the Neurospinal Society of Japan (NSJ) to analyze treatment policies and outcomes. The aim was to present optimal treatment methods for spinal cord astrocytoma and to identify predictors of better outcomes.

**Methods:** Among 1033 consecutive cases of spinal cord intramedullary tumors treated surgically at 58 centers affiliated with the NSJ, 57 patients were diagnosed with diffuse astrocytoma (WHO grade II) and were enrolled in the present study. Among these 57 patients, treatment methods, outcomes, and tumor proliferation rate as evaluated by the MIB-1 staining index (SI) were analyzed, and the optimal treatment method for spinal cord astrocytomas (grade II) was determined. In addition, the authors searched for factors predicting better treatment outcomes.

**Results:** Treatment for spinal cord astrocytoma comprised three methods: surgery alone in 30 patients, adjuvant radiation therapy in 13 patients, and adjuvant chemoradiotherapy in 13 patients. One patient who did not undergo surgery was excluded from survival analysis. Treatment with surgery alone or surgery with radiotherapy was associated with significantly longer overall and progression-free survivals than that with adjuvant chemoradiotherapy. Patients treated with radiation therapy had a higher MIB-1 SI than those treated with surgery alone. The extent of tumor resection tended to correlate with longer survival. In contrast, postoperative neurological worsening showed the inverse order. Adjuvant chemoradiotherapy was associated with the shortest survival in both total cases and recurrent cases. The optimal cutoff value of MIB-1 SI for predicting longer survival by surgery alone was less than 4.0%.

**Conclusions:** The optimal treatment for spinal cord astrocytoma is maximal tumor resection without neurological impairment. When some tumor remains in patients with an MIB-1 SI less than 4.0%, a wait-and-see approach is optimal. If the MIB-1 SI is higher than 4.0%, local radiation therapy is recommended. Adjuvant chemotherapy is not recommended for the treatment of grade II spinal cord astrocytoma.

**Keywords:** WHO grade II; diffuse astrocytoma; oncology; optimal treatment; resection; spinal tumor.