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Transdural location as a predictor of recurrence in spinal cord meningiomas

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Abstract

Spinal cord meningiomas are typically benign, rare tumors that pose clinical challenges owing to their location and potential for spinal cord compression. This study aimed to assess the radiological features of spinal cord meningiomas and the key factors associated with their recurrence. We conducted a retrospective, single-institution study on 67 patients with pathologically confirmed spinal cord meningiomas who were surgically treated between January 2016 and December 2023.

Radiological features, such as tumor size, enhancement, tumor signal intensity, and anatomical location, were assessed using preoperative magnetic resonance imaging. Clinical outcomes were evaluated using univariate and multivariate logistic regression analyses to identify risk factors for recurrence. Of the 67 patients, six (9.0 %) experienced a recurrence during a mean follow-up of 31.8 months. Results of univariate analysis suggested that a younger age, high World Health Organization grade, enhancement, and transdural location were significantly associated with tumor recurrence ($p < 0.05$). Multivariate analysis confirmed that a younger age ($p = 0.027$) and transdural growth ($p = 0.006$) were significant independent predictors of recurrence. Our study identified younger age and transdural tumor location as significant risk factors for spinal cord meningioma recurrence. A total resection is the primary surgical goal; however, tumors with complex anatomical presentations, especially those exhibiting transdural growth, pose significant challenges. The findings highlight the importance of developing tailored surgical approaches and intensifying postoperative surveillance in high-risk patients to reduce the recurrence likelihood.

Keywords: (Intradural Extramedullary) Spinal Cord Neoplasms; Magnetic Resonance Imaging; Outcome; Recurrence; Risk Factors; Spinal Meningioma.

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