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Meningioma
Peritumoral brain edema in benign meningiomas: correlation with clinical, radiologic, and surgical factors and possible role on recurrence

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Abstract
Background

Approximately 60% of meningiomas are associated with peritumoral edema.

Various causative factors have been discussed in the literature. The objective of this study was to investigate the correlation of PTBE with clinical, radiologic, and surgical aspects and recurrence of meningiomas.

Methods

Sixty-one patients with benign meningiomas were chosen for surgical treatment by the Group of Brain Tumors and Metastasis of the Department of Neurosurgery. All patients underwent complete surgical resection

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(Simpson grades 1 and 2), and those with atypical and malignant histopathologic grades were excluded. Tumors located in the cavernous sinus, tuberculum sellae, foramen magnum, ventricles, and petroclival region were excluded.

Results

Edema extension had a positive correlation with the higher recurrence rates ($P = .042$) and with the presence of irregular margins ($P < .011$) on bivariate analysis. Meningiomas with larger edema sizes also showed correlation with large meningiomas ($P = .035$), and the ones with smaller edema sizes correlated with the tentorial location ($P = .032$). Multivariate analysis showed an association between PTBE and the presence of seizures (odds ratio, 3.469), large meningiomas (odds ratio, 15.977), and for each cubic centimeter added to its size, the risk of edema increased 1.082 times (odds ratio).

Conclusion

Peritumoral brain edema may be related to the invading potential of meningiomas and may play a role in the recurrence potential of the tumor. As a consequence, it is reasonable to consider the presence of edema as an additional factor to be taken into account when mapping out strategies for the treatment of meningiomas.

Keywords: Meningioma; Brain edema; Recurrence; Magnetic resonance imaging; Simpson grade

Abbreviations: 95% CI, 95% confidence interval; CT, computed tomography; KS, Karnofsky scale; MRI, magnetic resonance imaging; OR, odds ratio; PTBE, peritumoral brain edema; VEGF, vascular endothelial growth factor; WHO, World Health Organization

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