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**Volume 69, Issue 1**, Pages 51-61  
(January 2008)

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## Cognitive function of patients with brain tumor in pre- and postoperative stage

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Received 14 November 2006; accepted 18 July 2007

### Abstract

#### Background

Nobody knows whether cognitive dysfunction affects survival. Furthermore, it is unknown whether the dysfunction is caused by the tumor itself or by its treatment.

#### Methods

Patients with 20 gliomas (LGG, 7; MG, 13 [AG, 4; GM, 9]) in the right brain (nondominant) and 11 gliomas (LGG, 1; MG, 10 [AG, 6; GM, 4]) in the left brain (dominant) were studied. Thirty-four patients with meningioma were also studied. Cognitive function was evaluated by the 3MS examination, and propriety of radical resection of tumor was reviewed.

#### Results

Cognitive function pre-Op and post-Op was normal in patients with LGG and MGs in the right brain but decreased before an Op in all patients with MG in the left brain, and they did not normalize after Op. In patients with MG in left brain, the test of temporal and spatial orientation, first recall, similarities, 4-legged animals, mental reversal, and writing decreased after Op. Cognitive hypofunction before or after Op did not correlate with tumor malignancy and degree of tumor resection.

#### Conclusion

Firstly, radical Op should aim at improvement of cognitive function for patients with glioma in the right brain, and for patients with glioma in the left brain, QOL should be thought about without expecting improvement of cognitive function. Secondly, improvement of cognitive function cannot be anticipated in patients with meningioma in the left brain. Aged patients older than 75 years require carefulness in Op. Then, damage of the cingulate gyrus and corpus callosum should be avoided in the left brain.

This study emphasizes that clinicians should be careful in the evaluation of cognitive function in glioma and meningioma treatment.

**Abbreviations:** AG, anaplastic glioma, LGG, low-grade glioma, GM, glioblastoma, KPS, karaofsky performance scale, MG, malignant glioma, MMS, mini-mental state, MRI, magnetic resonance imaging, Op, operation, RT, radiotherapy, T2WI, T2-weighted image, 3MS, modified MMS, QOL, quality of life

**Keywords:** Cognitive function, 3MS examination, Glioma, Meningioma, Dominant/Nondominant brain, Treatment

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PII: S0090-3019(07)00919-6

doi:10.1016/j.surneu.2007.07.064

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