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Original articles

Late neurocognitive sequelae in WHO grade I meningioma patients

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Abstract

Background: Information on the neurocognitive outcome following treatment of benign meningiomas is virtually lacking. This is remarkable considering these patients's survival is the most favorable of all intracranial tumors. The aim of the present study is therefore to document the extent and nature of neurocognitive deficits in WHO grade I meningioma patients after treatment.

Methods: Eighty-nine WHO grade I meningioma patients who underwent surgery with or without adjuvant radiotherapy were individually matched to 89 healthy controls for age, sex, and educational level. Neurocognitive functioning of patients was assessed at least one year following treatment and compared to that of healthy controls using Student's t-tests. Additionally, associations between tumor characteristics (size, lateralization and localization), treatment characteristics (radiotherapy), and epilepsy burden (based on seizure frequency and antiepileptic drug use) and neurocognitive functioning were investigated.

Results: Compared to healthy controls meningioma patients showed significant impairments in executive functioning ($p < 0.001$), verbal memory ($p < 0.001$), information processing capacity ($p = 0.001$), psychomotor speed ($p = 0.001$), and working memory ($p = 0.006$).

Patients with skull base meningiomas performed significantly lower on three out of six neurocognitive domains when compared to convexity meningiomas. Left-sided as opposed to right sided meningiomas were related to verbal memory deficits. A higher epilepsy burden was significantly associated with lower executive functioning, which primarily could be attributed to antiepileptic drug use. No significant associations were established between neurocognitive status and radiotherapy or tumor volume.

Conclusions: Meningioma patients are characterized by long-term deficits in neurocognitive functioning that can partly be attributed to the use of antiepileptic drugs and tumor location, but not to the use of radiotherapy.

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