Quantitative analysis of brain edema in patients with malignant glioma treated with BCNU wafers.

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Abstract

BCNU wafers are a form of interstitial chemotherapy that is expected to improve the survival of patients with malignant glioma. However, their adverse events, especially brain edema, sometimes cause significant clinical symptoms. In this study, we performed a volumetric analysis of brain edema after the implantation of BCNU wafers and reported on the clinical course, and exacerbation factors of brain edema. Twelve patients who underwent surgical resection of supratentorial malignant glioma and BCNU wafer implantation, were enrolled. Radiographic quantitative analysis was conducted and compared with a historical control. The volume change in brain edema was divided into three groups and correlation with clinical symptoms was then evaluated. Compared with the control group, the brain edema in the BCNU wafer implantation group was significantly prolonged after surgery. Radiographic volumetric analysis revealed an increase of more than 25% at any time after surgery in four patients (33%) and a reduction of less than 25%, 1 month after surgery in three patients (25%). Grade 3 clinical deterioration related to brain edema occurred in two patients and Grade 2 in one patient. Univariate analysis revealed that the radiographic deterioration of brain edema had no correlation with age, sex, diagnosis, tumor grade, preoperative volume of brain edema and tumor, residual tumor volume, or number of BCNU wafers. Radiographic quantitative analysis of brain edema indicated that BCNU wafer implantation may induce the prolongation and enlargement of brain edema with or without neurological deterioration. Brain edema may be controlled by intensive perioperative treatment with diuretics and corticosteroids.

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KEYWORDS: BCNU wafer; Brain edema; Malignant glioma

PMID: 27452129 DOI: 10.1016/j.jocn.2016.03.042

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