Abstract

Pseudoprogression (psPD) is a radiation-induced toxicity that has substantial neurological consequence in glioblastoma (GBM) patients. MGMT promoter methylation has been shown to be an important prognostic factor of psPD, but the significance of extent of resection (EOR) remains unclear. We performed a retrospective analysis on newly diagnosed GBM patients with assessable MGMT promoter status who underwent the Stupp protocol. EOR was grouped into gross total resection (GTR), subtotal resection (STR), partial resection (PR) and stereotactic biopsy. Contrast enhancing lesion enlargement was classified as psPD or non-psPD. Among a total of 101 patients, GTR, STR, PR and stereotactic biopsy was performed in 57 (56.4 %), 34 (33.7 %), 9 (8.9 %) and 1 patient (1 %), respectively. Follow-up imaging at the end of Stupp protocol classified 45 patients (44.6 %) as psPD and 56 (55.4 %) as non-psPD. psPD was observed in 24 (61.5 %) of 39 patients with methylated MGMT promoter and 21 (33.9 %) of 62 patients with unmethylated MGMT promoter (p < 0.01). psPD was documented in 17 (29.8 %), 19 (55.9 %), 8 (88.9 %) and 1 (100 %) patient with GTR, STR, PR and stereotactic biopsy (p < 0.01), respectively. On multivariate analysis MGMT promoter status (OR 3.36, 95 % CI 1.36-8.34) and EOR (OR 4.12, 95 % CI 1.71-9.91) were independent predictors of psPD. A Cox proportional hazards model showed that MGMT status (HR 2.51, p < 0.01) and EOR (HR 2.99, p < 0.01) significantly influenced survival. MGMT status and EOR have a significant impact on psPD. GTR can reduce the side effects of psPD and prolong survival.

KEYWORDS: Extent of resection; Glioblastoma; MGMT promoter status; Pseudoprogression

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