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Carmustine wafer implantation for supratentorial glioblastomas, IDH-wildtype in "extreme" neurosurgical conditions

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Abstract

We assessed the feasibility of Carmustine wafer implantation in "extreme" conditions (i.e. patients > 80 years and Karnofsky Performance Status score < 50) and of implantation ≥ 12 Carmustine wafers in adult patients harbouring a newly diagnosed supratentorial glioblastoma, IDH-wildtype. We performed an observational, retrospective single-centre cohort study at a tertiary surgical neuro-oncological centre between January 2006 and December 2021. Four hundred eighty patients who benefited from a surgical resection at first-line treatment were included. We showed that Carmustine wafer implantation in patients > 80 years, in patients with a Karnofsky performance status score < 50, and that implantation ≥ 12 Carmustine wafers (1) did not increase overall postoperative complication rates, (2) did not affect the completion of standard radiochemotherapy protocol, (3) did not worsen the postoperative Karnofsky Performance Status scores, and (4) did not significantly affect the time to oncological treatment. We showed that the implantation of ≥ 12 Carmustine wafers improved progression-free survival (31.0 versus 10.0 months, $p = 0.025$) and overall survival (39.0 versus 16.5 months, $p = 0.041$) without increasing postoperative complication rates. Carmustine wafer implantation during the surgical resection of a newly diagnosed supratentorial glioblastoma, IDH-wildtype is safe and efficient in patients > 80 years and in patients with preoperative Karnofsky Performance Status score < 50. The number of Carmustine wafers should be adapted (up to 16 in our experience) to the resection cavity to improve survival without increasing postoperative overall complication rates.

Keywords: Brain neoplasm; Carmustine wafer; Glioblastoma; Glioma; Neuro-oncology; Neurosurgery.

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