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Clinical Course after Carmustine Wafer Implantation for Newly Diagnosed Adult-type Diffuse Gliomas; A controlled propensity matched analysis of a single center cohort

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Abstract

Purpose: It remains unclear whether combining carmustine wafer (CW) implantation with the standard treatment for adult-type diffuse gliomas is safe and has a prognostic impact. This study aimed to investigate the prognostic value and safety of CW implantation.

Methods: Adult patients with IDH-wild-type and -mutant gliomas, grades 3-4 treated with surgical resection, radiotherapy, and temozolomide chemotherapy between 2013 and 2023 were surveyed. CWs were implanted except in cases of intraoperative wide ventricle opening or marked preoperative brain swelling. For survival analyses, a case-matched dataset based on propensity score matching (PSM), including multiple factors (patient background, diagnosis, and extent of resection) was generated. Progression-free survival (PFS), overall survival (OS), and frequency of complications of CW implantation (brain edema, infection, and cerebrospinal fluid leakage) were compared between the CW and non-use groups.

Results: In total, 127 patients (75 in the CW use group and 52 in the non-use group) were enrolled. Regardless of stratification, no significant differences in PFS and OS were observed between the CW use and non-use groups. The frequency of postoperative brain edema was significantly higher in the CW use group than in the non-use group. An adjusted dataset containing 41 patients in the CW use and nonuse groups was generated. Even after PSM, CW implantation had no prognostic effect.

Conclusions: CW implantation with standard treatment demonstrated little beneficial effect for the present strategy of CW use.

Keywords: Adult-type diffuse glioma; Carmustine wafer; Propensity score matching; Radiotherapy; Temozolomide.

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