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# Prognostic impact of second surgical resection in IDH wildtype recurrent glioblastoma following chemo-radiation therapy: a propensity score analysis cohort study

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## Abstract

**Background:** The optimal treatment for recurrent glioblastoma (rGBM) remains controversial. We explore the impact of re-surgical resection, compared to solely oncological treatment, in a cohort of isocitrate dehydrogenase (IDH) wild-type rGBM.

**Methods:** A retrospective cohort study included adult patients diagnosed with IDHwt rGBM. At recurrence, patients received re-surgical resection (re-surgery group - RSG) or further oncological treatments (chemo-radiation group - CRG). Overall survival (OS) and progression-free survival (PFS) were analyzed. A Cox regression model was performed to identify variables related to outcomes. Furthermore, to minimize possible study design-related bias, a propensity score analysis was applied. Additionally, subgroup analysis to explore the role of adjuvant therapies was performed.

**Results:** In a cohort of 104 patients with rGBM, 44 patients received re-surgical resection. Patients in RSG experienced a longer OS compared to CRG (21 vs. 12 months,  $p < 0.001$ ); a shorter survival in the CRG was confirmed at the propensity score analysis (HR 2.16,  $p = 0.004$ ). The median cohort PFS was 4 months. The PFS was similar between the RSG and CRG (6 vs. 4 months). The variables associated with OS were: age, subventricular zone involvement, repeated chemotherapy. The variables associated with PFS were: extent of resection at first surgery, MGMT methylation, no adjuvant therapies, and delayed radiotherapy. At the subgroup analysis, re-irradiation was not associated with OS or PFS benefit in the RSG; adjuvant chemo-radiation therapy offers a survival advantage compared to standard adjuvant chemotherapy in the CRG.

**Conclusions:** Re-surgical resection offers a significant survival benefit compared to the sole adjuvant treatment in patients with IDHwt rGBM.

**Keywords:** Glioblastoma; Glioblastoma recurrence; Overall survival; Progression free survival; Re-surgery.

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