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The survival effect of repeat surgery at glioblastoma recurrence and its trend: A systematic review and meta-analysis.

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BACKGROUND: Glioblastoma (GBM) is a dismal disease managed in the first instance by surgical resection, temozolomide and radiation. The role of repeat surgery at recurrence remains ill defined. This study aims to quantify the effect of repeat surgery in recurrent GBM on overall survival (OS) and determine if a trend in reported effect over time exists.

METHODS: Searches of seven electronic databases from inception to January 2018 were conducted following Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines. There were 2692 articles identified for screening. Prognostic hazard ratios (HRs) derived from multivariate regression analysis were extracted, and analyzed using meta-analysis of proportions and linear regression.

RESULTS: Eight observational studies reporting prognostic HRs in 10 cohorts were included. They described 1906 recurrent GBM diagnoses, managed by surgery at primary diagnosis, with 709 (37%) undergoing further, repeat surgery at recurrence. Repeat surgery was shown to confer a statistically significant survival advantage compared to no surgery at recurrence in the pooled cohort (HR, 0.722; $p < 0.001$). Newer studies trended towards a more superior prognostic advantage of repeat surgery when compared to earlier studies (effect coefficient, 0.856; $p = 0.012$).

CONCLUSIONS: This meta-analysis of contemporary literature suggests repeat surgery at GBM recurrence in select patients confers a significant, prognostic OS advantage independent of other prognostic factors. Furthermore, newer studies are significantly more likely to suggest greater benefit than older studies. The main limitation is the selection bias inherent in the cohorts pooled for analysis. Larger prospective, randomized controlled studies are needed to validate the findings of this study, and provide stratification for such benefit justified by quality of life metrics..

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