The Aurvival Effect of Repeat Surgery at Glioblastoma Recurrence: A Systematic Review and Meta-Analysis

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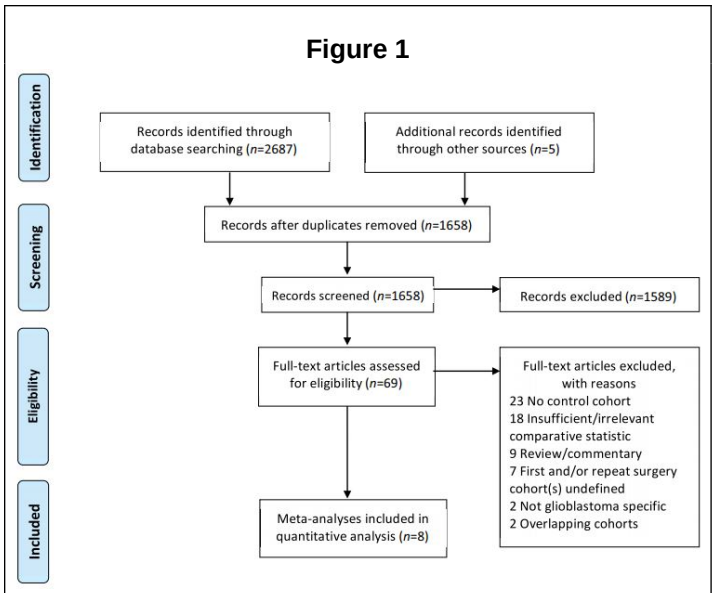
Introduction

The role of repeat surgery at glioblastoma 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

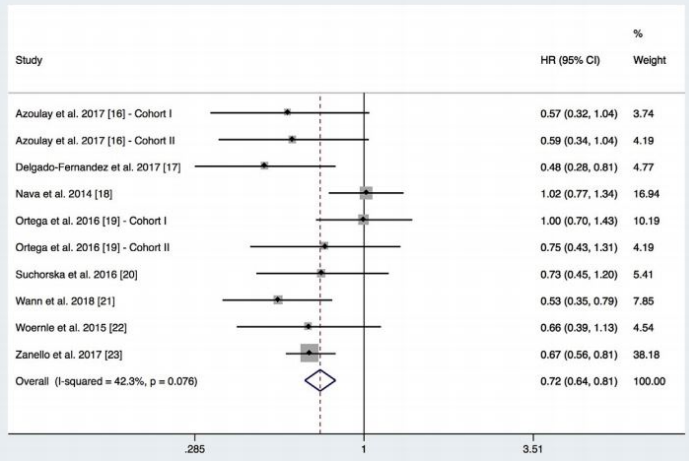
Searches of seven electronic databases from inception to January 2018 were conducted following Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (Figure 1). There were 2692 articles identified for screening. Prognostic hazard ratios (HRs) derived from multivariate regression analysis were extracted, and analyzed using meta-analysis of proportions and linear regression.

Figure 1



PRISMA guidelines search strategy

Figure 2



A forest plot of the pooled hazard ratios (HRs) and their corresponding 95% confidenceintervals (CIs) of all cohorts investigating prognostication by repeat surgery. The weighted hazardratio, the 95% confidence interval, and the relative weightings are represented by the middle of thesquare, the horizontal line, and the relative size of the square respectively.

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 reoperation 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 superior prognostic advantage of repeat surgery when compared to earlier studies (effect coefficient, 0.856; p=0.012). (Figure 2)

Conclusions

This meta-analysis of contemporary literature suggests repeat surgery at GBM recurrence in select patients confers a significant, independent, prognostic OS advantage. 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.

Learning Objectives

By the conclusion of this presentation, participants will be able to

1. Discuss the evidence supporting the role of reoperation for GBM recurrence

2. Identify sources of bias in a meta-analysis