

ABSTRACT NO:28
META-ANALYSIS**Survival Impact of Supramarginal Resection According to MGMT Promoter Methylation Status in Glioblastoma: A Systematic Review and Meta-analysis**Simon John¹, Tehniat Khaliq², Jahan Khan³**Abstract**

Objective: To evaluate the association between supramarginal resection (SMR) and survival in IDH-wildtype glioblastoma and determine whether MGMT promoter methylation status modifies this association.

Methods: A PROSPERO-registered (CRD420261417230) systematic review and meta-analysis was conducted in accordance with PRISMA 2020. PubMed/MEDLINE, Embase, Web of Science, Cochrane Library, and ClinicalTrials.gov were searched through January 2025. Studies comparing SMR with conventional resection in predominantly IDH-wildtype glioblastoma reporting survival outcomes by MGMT status were included. Random-effects meta-analysis pooled hazard ratios (HRs) for overall survival (OS) and progression-free survival (PFS). Risk of bias was assessed using the Newcastle–Ottawa Scale and RoB2.

Results: Fifteen studies (34,006 patients) met the inclusion criteria, and 13 studies (32,780 patients) were meta-analyzed. SMR was associated with improved OS (HR 0.62, 95% CI 0.54–0.71) and PFS (HR 0.63, 95% CI 0.51–0.78). Improved OS was observed in both MGMT-methylated (HR 0.52, 95% CI 0.40–0.67) and MGMT-unmethylated tumours (HR 0.71, 95% CI 0.60–0.85), with no significant interaction by MGMT status ($p=0.09$). Most included studies were observational.

Conclusion: SMR was associated with improved survival irrespective of MGMT promoter methylation status. However, the evidence is predominantly observational and susceptible to confounding. Randomized controlled trials are required before SMR can be recommended as routine surgical practice.

Keywords: (Glioblastoma; Supramarginal resection; MGMT promoter methylation)

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