Supramaximal resection outcomes

> Findings of: Teske N, Dono A, Young JS, Juenger ST, Youssef GC, Häni L, Sciortino T, Bruno F, Dietrich J, Mau CY, Weller M, Beck J, Hervey-Jumper S, Molinaro AM, Chang SM, van den Bent M, Vogelbaum MA, Ruge MI, Cahill DP, Rudà R, Bello L, Grau SJ, Schnell O, Huang RY, Wen PY, Tandon N, Berger MS, Tonn JC, Esquenazi Y, Karschnia P. Associations of supramaximal resection with outcome in glioblastoma across age groups: a report of the RANO resect group. Neuro Oncol. 2025 Oct 25:noaf239. doi: 10.1093/neuonc/noaf239. Epub ahead of print. PMID: 41137668.

Here is a detailed summary of the key findings of the paper by Nico Teske et al., "Associations of supramaximal resection with outcome in glioblastoma across age groups: a report of the RANO Resect Group" (RANO Resect Group), *Neuro-Oncology* (2025 Oct 25; noaf239) (PMID: 41137668) PubMed +2 DKFZ +2

Background

- The study addresses the role of resection extent in patients with newly-diagnosed and recurrent IDH-wildtype glioblastoma (GBM), with specific focus on how age influences the prognostic value of more aggressive resection ("supramaximal" resection, i.e., beyond the enhancing tumour) vs. standard maximal resection. DKFZ +1

- There is a clinical controversy in older patients (≥65 yrs) regarding how aggressive surgical resection should be, given frailty, comorbidities, and potentially more limited tolerability of adjuvant therapies. The paper aimed to stratify outcomes by age group (<65 vs ≥65 yrs). PubMed +1

Methods

- A retrospective, multi-centre (10 neuro-oncological centres) international cohort was collected via the RANO Resect group. PubMed +1

- They included patients with newly diagnosed and recurrent IDH-wildtype glioblastoma. For the newly diagnosed cohort, n = 1,260 (of whom 512 were aged ≥65 yrs). PubMed +1

- For the first recurrence cohort, n = 310 (of whom 92 were aged ≥65 yrs). DKFZ +1

- The paper analysed the associations between residual contrast-enhancing tumour volumes post-op, extent of resection (including supramaximal resection) and survival outcomes, adjusting for molecular and clinical factors, and also performed propensity-score matching to reduce confounding. Boris Portal +1

Key Findings

Newly diagnosed GBM

- Lower postoperative residual contrast-enhancing tumour volume was significantly associated with improved survival in both age groups (<65, ≥65). PubMed +1
- However, the *magnitude* of the association (i.e., survival benefit) was **more pronounced** in younger patients (<65 yrs) compared to older patients (≥65 yrs). DKFZ +1
- Critically: **Supramaximal resection** (i.e., resection beyond the contrast-enhancing tumour margin) was associated with significantly improved survival *only* in the younger (<65) cohort: 40 vs 20 months median survival (p=0.001). PubMed +1
- In the older cohort (≥65 yrs), supramaximal resection did *not* show the same level of association with improved survival (i.e., no clear benefit beyond maximal resection). DKFZ +1

Recurrent GBM

- In the recurrent setting (first recurrence), maximal resection of contrast-enhancing tumour was associated with favourable outcomes, particularly in younger patients. DKFZ +1
- However, supramaximal resection in the recurrent setting did *not* show a statistically significant favourable association in either younger or older patients. PubMed +1

Interpretation / Clinical Implications

- The study supports that achieving **complete or near-complete resection of the contrast-enhancing tumour** remains important and prognostically favourable in both younger and older patients.
- But the additional benefit of more aggressive supramaximal resection (beyond the enhancing tumour) appears to hold *only* in younger patients with newly diagnosed glioblastoma.
- For older patients (≥65 yrs), while maximal resection remains beneficial, the incremental benefit of more extensive supramaximal resection is **less clear**, and may not justify increased surgical risk or morbidity in this group.
- The authors suggest that surgical strategies should be **age-stratified and individualized**: aggressive resection in younger patients may be justified; in older patients, surgical goals may need to balance tumour removal with functional outcome and tolerance of adjuvant therapy. Boris Portal +1

- In the recurrent setting, the benefit of supramaximal resection is not demonstrated, so maximal resection remains a valid goal but further extension may not yield additional survival advantage.

Limitations and Considerations

- Retrospective design, even with propensity-score matching, so residual confounding is possible (e.g., selection bias: fitter younger patients may have had more aggressive surgery).
- The definition of “supramaximal resection” may vary across centres (and imaging thresholds), and risks of neurological morbidity are relevant (although the paper does not appear to deeply dissect morbidity outcomes by age).
- The older cohort may differ in adjuvant therapy receipt, comorbidities, performance status, tumour biology – although authors attempted adjustment.
- The study focuses on IDH-wildtype GBM; results may not be generalizable to IDH-mutant gliomas or other glioma types.
- Supramaximal resection beyond enhancing tumour usually implies resection of non-enhancing infiltrative tissue (e.g., T2/FLAIR abnormality) and carries increased risk; the study helps refine which patients may benefit.

Annotated Bibliography Entry (Vancouver style)

Teske N, Dono A, Young JS, Juenger ST, Youssef GC, Häni L, Sciortino T, Bruno F, Dietrich J, Mau CY, Weller M, Beck J, Hervey-Jumper S, Molinaro AM, Chang SM, van den Bent M, Vogelbaum MA, Ruge MI, Cahill DP, Rudà R, Bello L, Grau SJ, Schnell O, Huang RY, Wen PY, Tandon N, Berger MS, Tonn JC, Esquenazi Y, Karschnia P; RANO Resect Group. Associations of supramaximal resection with outcome in glioblastoma across age groups: a report of the RANO Resect Group. Neuro-Oncol. 2025 Oct 25; noaf239. doi:10.1093/neuonc/noaf239. PubMed PMID: 41137668.
Summary: This multicentre retrospective study of 1,260 newly-diagnosed and 310 first-recurrence IDH-wildtype glioblastoma patients compared outcomes of contrast-enhancing tumour resection and supramaximal resection across age groups (<65 versus ≥65 yrs). Lower residual tumour volumes were prognostic in all ages, but supramaximal resection conferred a significant survival benefit only in younger (<65) patients (median ~40 vs ~20 months) and not in older patients or in the recurrent setting. The authors advocate for age-stratified surgical goals in glioblastoma.