

Neuro Oncol. 2024 Dec 7:noae264. doi: 10.1093/neuonc/noae264. Online ahead of print.

# Neuro-Oncological Superiority of Supratotal Resection in Lower-Grade Gliomas

Alberto L Gallotti <sup>1 2</sup>, Marco Rossi <sup>2 3</sup>, Marco Conti Nibali <sup>2</sup>, Tommaso Sciortino <sup>2</sup>, Lorenzo G Gay <sup>2</sup>, Guglielmo Puglisi <sup>2 3</sup>, Antonella Leonetti <sup>2 3</sup>, Francesco Bruno <sup>4</sup>, Roberta Rudà <sup>4</sup>, Riccardo Soffietti <sup>4</sup>, Gabriella Cerri <sup>3</sup>, Lorenzo Bello <sup>1 2</sup>

Affiliations

PMID: 39657577 DOI: [10.1093/neuonc/noae264](https://doi.org/10.1093/neuonc/noae264)

## Abstract

**Background:** Supratotal-Resection (SpTR) is a promising surgical strategy in Lower-grade gliomas (LGGs). SpTR assessment, feasibility and distinctive features, as well as clinical benefit at first and second surgery and on overall-survival must be better characterized. The critical percentage of resection exceeding FLAIR margins to obtain clinical benefit and its impact on long-term functional performance are also undefined.

**Methods:** Included were 704 patients with primary and 439 with recurrent LGGs seen between 2010-2019, who underwent resection with Brain-Mapping-Technique (BMT) aimed at achieving a SpTR without any "a-priori" selection. Extent-Of-Resection, evaluated on 3D-FLAIR-MR and categorized according to residual tumor and cavity volume, was associated with Progression-Free-Survival (PFS) and Malignant(M)PFS at first and second surgery, and Overall-Survival by univariate, multivariate and propensity-score analysis. Functional performance was assessed by neuropsychological-NPS evaluation.

**Results:** SpTR evaluation requires volumetric assessment enhanced by brain deformation measurement in parietal tumors; SpTR rate accounts on average for 50.2% and 35.7% at first and second surgery, is higher in grade-2, frontal and temporal locations (at expenses of Total-Resection-TR). Compared to TR, SpTR reduces and postpones first and second recurrences in all molecular subtypes and grades, delays MPFS without difference in rate and prolongs Overall-Survival. A degree of SpTR > 120% associates with the lowest recurrence risk. SpTR associates with the best NPS longitudinal course.

**Conclusions:** This study supports feasibility of SpTR in LGGs, its benefit at first and second surgery regardless of molecular subtypes, and on Overall-Survival, significantly reducing recurrence when SpTR > 120%; SpTR also associates with the best patients' functional outcome.

**Keywords:** Lower-grade gliomas; Neuropsychological evaluation; Overall Survival; Recurrence; Supratotal Resection.

© The Author(s) 2024. Published by Oxford University Press on behalf of the Society for Neuro-Oncology. All rights reserved. For commercial re-use, please contact [reprints@oup.com](mailto:reprints@oup.com) for reprints and translation rights for reprints. All other permissions can be obtained through our RightsLink service via the Permissions link on the article page on our site—for further information please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com).

[PubMed Disclaimer](#)