

Full length article

# Management considerations for very elderly patients with intracranial low-grade gliomas: A surveillance, epidemiology, and end results database multivariable assessment

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## Highlights

- Management of intracranial low-grade gliomas (LGG) in the very elderly ( $\geq 85$  years) remains poorly characterized.
- Patients aged  $\geq 75$  years with histologically confirmed intracranial LGG were identified from the SEER database (2000–2022).
- In patients  $\geq 85$  years old, subtotal (HR:0.628;  $p = 0.027$ ) and gross total (HR 0.543;  $p = 0.033$ ) resection was associated with improved survival.

## Abstract

### Background and objectives

Management of intracranial low-grade gliomas (LGG) in the very elderly ( $\geq 85$  years) remains poorly characterized as most studies classify “elderly” patients broadly as  $\geq 65$  years, which obscures age-specific risks and outcomes among the oldest-old. In this study, we evaluated treatment patterns and survival predictors in very elderly patients with LGG using a large population-based cohort registry.

### Methods

Patients aged  $\geq 75$  years with histologically confirmed intracranial LGG were identified from the Surveillance, Epidemiology, and End Results (SEER) database (2000–2022). Cases were stratified into elderly (75–84 years) and very elderly ( $\geq 85$  years) cohorts. Multivariable Cox proportional hazards models were used to identify predictors of overall survival (OS), and hazard ratios (HRs) and 95% confidence intervals (CIs) were reported.

### Results

A total of 1124 patients met inclusion criteria, including 942 aged 75–84 and 182 aged  $\geq 85$  years. In the  $\geq 85$ -year cohort (the primary cohort of interest), both subtotal resection (HR: 0.628; 95% CI: 0.416–0.949;  $p = 0.027$ ) and gross total resection (HR: 0.543; 95% CI: 0.311–0.950;  $p = 0.033$ ) were independently associated with improved survival. No significant associations were observed for chemotherapy or radiotherapy, though neither demonstrated harm. In the 75–84 year comparison cohort, subtotal resection (HR: 0.731;  $p < 0.001$ ), gross total resection (HR: 0.684;  $p < 0.001$ ), and chemotherapy (HR: 0.799;  $p = 0.014$ ) predicted longer OS.

### Conclusions

Surgical resection remains a significant predictor of improved survival even among patients aged  $\geq 85$  years, which suggests that carefully selected very elderly patients can benefit from operative management, and surgical management should not be precluded based on age alone. Chemotherapy and radiotherapy effects appeared inconclusive in the very elderly but not detrimental. Future studies integrating molecular and quality-of-life data are needed to refine management strategies in this uniquely vulnerable population.

## Introduction

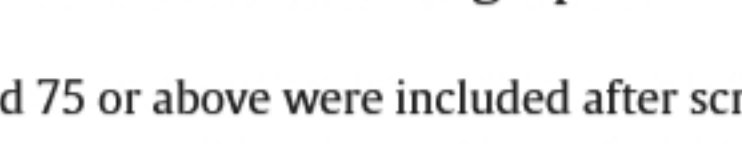
Intracranial low grade gliomas (LGG) refer to a diverse group of primary brain tumors, often arising in young healthy patients with World Health Organization grades of I and II. [1], [2] Treatment for these patients often encompasses a multi-approach involving observation, radiation, chemotherapy, and surgical intervention when appropriate. [1] Classification of these tumors remains on the basis of IDH mutation status, which makes tissue samples imperative for proper management. [3]

While these tumors often arise in younger adults, LGG is also less commonly encountered in older patients, where management is complicated by age-related comorbidities and reduced physiological reserve. [4] Although the biological behavior of LGG is relatively indolent, therapeutic decision-making in the very elderly ( $\geq 85$  years) presents distinct challenges. In this age group, the risks of surgery, anesthesia, and adjuvant therapy often compete with potential survival benefits, which inevitably leads to uncertainty regarding whether aggressive intervention is justified. [5] Consequently, data to support surgical decision-making in patients over 85 years old with LGG could be useful to clinicians. Data guiding management in this subgroup remain sparse, and most existing studies define “elderly” broadly as  $\geq 65$  years, which can obscure clinically meaningful differences in outcomes among the oldest patients. [6] Despite the abundance of literature on LGG, the current state remains deficient in assessing LGG in very elderly patients, particularly with respect to data on survival outcomes under certain management strategies. [6]

In this study, we used data from the Surveillance, Epidemiology, and End Results (SEER) registry to evaluate demographic, treatment, and survival factors in elderly patients with intracranial LGG with a primary emphasis on the very elderly ( $\geq 85$  years). By identifying predictors of overall survival (OS) in this population, this study aims to clarify whether surgical resection, chemotherapy, and radiotherapy remain a plausible component of management with respect to survival in patients at the upper extremes of age.

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## Section snippets

### Database

This retrospective cohort study used data from the SEER 17 database (2000–2022), a publicly available, de-identified resource sponsored by the National Cancer Institute. SEER collects cancer incidence and survival data from 17 geographically diverse registries, encompassing approximately 26.5% of the U.S. population. [7] The database includes information from hospitals and outpatient clinics across the West, Midwest, Southwest, Northeast, and Southeast regions of the United States. [8] Given ...

### Patient clinical characteristics and demographics

A total of 1124 patients aged 75 or above were included after screening for age and applying inclusion criteria for this assessment (Table 1). Of these, 13.7% ( $n = 154$ ) underwent GTR, 29.6% ( $n = 333$ ) underwent STR, and 56.7% ( $n = 637$ ) did not undergo surgical resection. A cross-assessment by age group of clinical variables revealed significant differences in the marital status, extent of resection, chemotherapy administration, and radiotherapy administration between the 75–84 and  $\geq 85$  age ...

### Discussion

This population-based assessment of elderly patients with intracranial LGG demonstrates that surgical resection remains a significant predictor of improved OS, even among the very elderly ( $\geq 85$  years). Low-grade gliomas are relatively uncommon in very elderly patients, and tumors identified in this age group may represent biologically distinct disease or reflect diagnostic and classification limitations. Contemporary WHO classification emphasizes integrated molecular and histologic criteria, ...

### Conclusion

Among patients aged  $\geq 85$  years with intracranial LGG, surgical resection was independently associated with improved OS by months, which highlights that carefully selected very elderly patients may still derive meaningful survival benefit from operative management. Chemotherapy and radiotherapy did not demonstrate significant survival advantages but were also not associated with harm in the very elderly. Their effects are inconclusive in this age group. These findings underscore that even in the ...

### Previous presentations

None ...

### Disclosures

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### CRedit authorship contribution statement

**Arjit Singh:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation. **Jacob Gould:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation. **Julian L. Gendreau:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Ahmed M. Raslan:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, ...

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## References (17)

- A.M. Giantini-Larsen *et al.*  
[Challenges in the diagnosis and management of low-grade gliomas](#)  
*World Neurosurg.* (2022)
- S. Wu *et al.*  
[Analysis of prognostic factors and surgical management of elderly patients with low-grade gliomas](#)  
*World Neurosurg.* (2023)
- D.A. Forst *et al.*  
[Low-grade gliomas](#)  
*Oncologist* (2014)
- L.R. Schaff *et al.*  
[State of the art in low-grade glioma management: insights from isocitrate dehydrogenase and beyond](#)  
*Am. Soc. Clin. Oncol.* (2024)
- D.A. Schomas *et al.*  
[Low-grade gliomas in older patients: long-term follow-up from Mayo Clinic](#)  
*Cancer* (2009)
- R. Parks *et al.*  
[Challenges in geriatric oncology—a surgeon’s perspective](#)  
*Curr. Oncol.* (2022)
- “Number of Persons by Race and Hispanic Ethnicity for SEER Participants – SEER Registries.” SEER, 2018,...
- National Cancer Institute. “About the SEER Program.” SEER,...

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## Cited by (0)

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