

Neurosurgery. 2025 Sep 19. doi: 10.1227/neu.00000000000003760. Online ahead of print.

# Long-Term Outcomes in Patients With Isocitrate Dehydrogenase-Mutated Grade 2 Glioma Who Never Received Adjuvant Oncological Treatment After Upfront Mapping-Based Surgical Resection

Hugues Duffau<sup>1 2 3</sup>

PMID: 40970733 DOI: [10.1227/neu.00000000000003760](https://doi.org/10.1227/neu.00000000000003760)

**Background and objectives:** Patients with low-grade glioma (LGG) have a long-life expectancy, especially after initial surgery. However, no report specifically investigated LGG patients who underwent only resection without oncological therapy. In this study, long-run outcomes were analyzed in LGG patients who never received adjuvant treatment after upfront mapping-based surgical resection.

**Methods:** Inclusion criteria were patients operated on by the author using intraoperative mapping for isocitrate dehydrogenase-mutated grade 2 gliomas, followed at least 3 years with no oncological treatment at last evaluation. Two groups were compared: group 1 comprising stable LGG or progressing very slowly (growth rate  $\leq 1$  mm/year) with a simple monitoring and group 2 comprising recurrent LGG (growth rate  $> 1$  mm/year), including patients who underwent reoperation(s).

**Results:** This consecutive series included 111 patients (49 men, mean age  $37.3 \pm 10.4$  years) with epilepsy in 74 cases (66.7%). The mean Karnofsky Performance Scale (KPS) score was  $96.5 \pm 5.7$ ; 98 patients (88.3%) worked before surgery. The mean preoperative tumor volume (TV) was  $21.4 \pm 17.2$  cm<sup>3</sup>. The mean postoperative KPS score was  $96.7 \pm 5.3$  (no permanent deficit) with 92 patients who returned to work (93.8%). The mean extent of resection was  $98.1 \pm 4.7\%$ , with 85 supratotal/total resections (76.6%)-mean residual TV of  $0.6 \pm 1.6$  cm<sup>3</sup>. There were 60 isocitrate dehydrogenase-mutant astrocytomas (54%) and 51 oligodendrogliomas. Forty-nine patients (44.1%) underwent reoperation(s) without deterioration after 164 resections. The mean follow-up was  $8.3 \pm 4$  years with an overall survival rate of 100%. At final evaluation, 108 patients (97.3%) had a KPS score  $\geq 80$  and 79 patients (80.6%) continued to work. In group 1, patients were older ( $P = .0009$ ) with lower preoperative TV ( $P = .028$ ), greater extent of resection ( $P = .002$ ), higher rate of (supra)total resections ( $P = .024$ ), and lower postoperative TV ( $P = .0009$ ). The growth rate was higher in patients with reoperation ( $P < .0001$ ).

**Conclusion:** Postoperative simple monitoring can be considered in selected patients after upfront mapping-based surgery for LGG, especially when (supra)marginal resection was achieved in tumor with slow growth rate, even after the age of 40 years.

**Keywords:** Functional outcomes; Intraoperative mapping; Low-grade glioma; Return to work; Surgery; Survival.