Glioblastoma prognosis

Overview

General Prognosis (IDH-wildtype, classic histological GBM)

- **Median Overall Survival (OS):** ~12–18 months
- **Median Progression-Free Survival (PFS):** ~6–9 months
- **2-year survival rate:** ~25%
- **5-year survival rate:** <5%

Key Prognostic Factors

Factor	Better Prognosis	Worse Prognosis
Age	< 50 years	> 65 years
Performance Status	KPS ≥ 70	KPS < 70
Extent of Resection	Gross total resection	Biopsy / subtotal
MGMT Promoter Methylation	Present	Absent
IDH Status	IDH-mutant (astrocytoma WHO 4)	IDH-wildtype
Enhancement Pattern	Non-enhancing (in some molGB)	Classic ring-enhancing lesion
Treatment	RT + Temozolomide	Palliative / incomplete RT

Special Subtype: Molecular Glioblastoma (molGB)

- Defined by: **TERT mutation**, **EGFR amplification**, **+7/−10 chromosomal pattern**, **IDH-wildtype**
- May lack contrast enhancement (mimicking LGG)
- Zerbib et al.:
  - **molGB without CE:** median OS ~31.2 months
  - **molGB with CE or histGB:** median OS ~18–20 months

[1)].

Conclusion

Glioblastoma remains a highly lethal tumor. Prognosis depends on a combination of:

- **Molecular profile** (especially IDH, MGMT, EGFR, TERT)
- **Imaging phenotype**
- **Extent of resection**
- **Treatment completion**

Note: The term **“glioblastoma”** now refers strictly to **IDH-wildtype** tumors, per WHO 2021

classification. IDH-mutant high-grade tumors are classified as **astrocytoma, Grade 4**, with **better prognosis**.

Retrospective observational cohort studies

In a retrospective observational cohort study, Zerbib et al., from the Department of Radiation Oncology, Institut Universitaire du Cancer de Toulouse Oncopole (IUCT-Oncopole), Claudius Regaud; INSERM UMR 1037, Cancer Research Center of Toulouse (CRCT); IRT Saint-Exupéry; Department of Engineering and Medical Physics, IUCT-Oncopole; Biostatistics & Health Data Science Unit, IUCT-Oncopole; Department of Neuroradiology, Hôpital Pierre-Paul Riquet, CHU Purpan; Department of Medical Oncology & Clinical Research Unit, IUCT-Oncopole; Pathology and Cytology Department, CHU Toulouse, IUCT-Oncopole; CerCo, Université de Toulouse, CNRS, UPS, CHU Purpan; Department of Neurosurgery, Hôpital Pierre-Paul Riquet, CHU Purpan; and University Toulouse III – Paul Sabatier, published in The Oncologist, sought to evaluate and compare the **clinical outcomes** of patients with **molecular glioblastoma (molGB)** and **histological glioblastoma (histGB)** treated with standard radio-chemotherapy. They also assessed whether **artificial intelligence (AI)** models could accurately **distinguish molGB without contrast enhancement (CE)** from **low-grade gliomas (LGG)** using **MRI FLAIR** imaging features.

Conclusion: Patients with **molGB** and **histGB** showed **similar overall survival** under standard treatment.

- However, **molGB without contrast enhancement (CE)** demonstrated a significantly **better median overall survival** (31.2 vs 18 months).
- **AI models** based on **FLAIR MRI features** were able to **differentiate non-enhancing molGB from LGG**, achieving a best-performing ROC AUC of **0.85**.

→ These findings support the **clinical relevance of non-enhancing molGB as a distinct subgroup** with better prognosis and highlight the **potential diagnostic utility of AI tools** in radiologically ambiguous cases.

This study presents itself as cutting-edge — mixing radiotherapy outcomes with artificial intelligence — but beneath the polished language and deep learning jargon lies a set of predictable flaws:

➊ **Retrospective and underpowered:** A 132-patient cohort — already heterogeneous — is further subdivided into **histGB**, **molGB with CE**, and **molGB without CE**. Statistical comparisons across these small subgroups are unreliable.

➋ **The AI angle?** Yes, a deep learning model differentiates molGB without CE from LGG with a **ROC AUC of 0.85**. Impressive? Only until you realize there is **no external validation**, **no real-world deployment**, and **no error analysis**. As usual, AI serves as a fashionable add-on — not a clinically deployable tool.

➌ **Overstated survival difference:** That non-enhancing molGB patients live longer (31.2 vs 18 months) is intriguing — but remains unexplained. There is **no analysis of methylation subclasses**, **no mention of MGMT promoter methylation**, and **no adjustment for diagnostic or therapeutic delays**. Are these findings rooted in biology or bias? The question isn’t asked.

4 Radiologic ambiguity ignored: Although the paper acknowledges that molGB can mimic LGG radiologically, it fails to address the clinical consequence: these tumors may be **underdiagnosed and undertreated**. AI is referenced, but **no clinical workflow is proposed** to resolve this problem.

5 Conclusion inflation: The abstract promises “diagnostic utility.” In reality, it delivers a **prototype model** with **unclear application**. Once again, **deep learning is praised**, but **no clinician can use it — not now, not soon**.

> In short: a visually attractive study, full of fashionable buzzwords and polite omissions.
> Good for citations, weak for clinical change.
> More radiogenomic theater than paradigm shift.

[2].

[1], [2]

Zerbib C, Robinet L, Ken S, Cavillon A, Roques M, Larrieu D, Siegfried A, Roux FE, Berjaoui A, Cohen-Jonathan Moyal E. Clinical outcome and deep learning imaging characteristics of patients treated by radio-chemotherapy for a “molecular” glioblastoma. Oncologist. 2025 Jun 4;30(6):oyaf127. doi: 10.1093/oncolo/oyaf127. PMID: 40542584.