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Title: Exceptional Long-Term Survival with Combination Chemoradiotherapy in a 72-Year-Old Glioblastoma Patient: A Case Study

Publication Type

Case Study

Year of Publication

2024

Patient Demographics

- **Age**: 72 years at diagnosis
- **Gender**: Male
- **Condition**: Newly diagnosed right frontal lobe glioblastoma
- **Presenting Symptoms**: Progressive left-sided weakness, headaches, and mild cognitive changes over 6 weeks
- **ECOG Performance Status**: 1
- **Comorbidities**: Controlled hypertension, type 2 diabetes mellitus
- **Smoking History**: Former smoker (quit 15 years prior)

Disease Focus

Glioblastoma multiforme (WHO Grade IV) demonstrating exceptional treatment response and prolonged survival beyond typical expectations for elderly patients

Clinical Presentation

The patient presented to emergency services following a witnessed seizure. MRI revealed a 4.8 cm heterogeneously enhancing mass in the right frontal lobe with surrounding vasogenic edema and 7 mm midline shift. The tumor crossed the corpus callosum with extension toward the contralateral hemisphere (butterfly glioma pattern).

Treatment Discussed

Surgical Intervention: Maximal safe resection achieved via right frontal craniotomy. Intraoperative neuromonitoring and 5-ALA fluorescence-guided surgery employed. Gross total resection confirmed on 48-hour postoperative MRI (>98% resection).

Adjuvant Chemoradiotherapy: Standard Stupp protocol initiated 4 weeks post-surgery: - External beam radiotherapy: 60 Gy in 30 fractions targeting the resection cavity plus 2 cm margin - Concurrent temozolomide: 75 mg/m² daily during radiotherapy (42 days) - Maintenance temozolomide: 150 mg/m² (cycle 1) escalated to 200 mg/m² (cycles 2-12), days 1-5 of 28-day cycles - Patient completed full 12 cycles with excellent tolerance

Supportive Care: Anti-epileptic therapy (levetiracetam 1000 mg BID), dexamethasone taper, proton pump inhibitor, prophylactic antiemetics, and Pneumocystis jirovecii prophylaxis during chemotherapy.

Study Outcome Summary

Molecular Pathology: - IDH1/2: Wild-type (confirmed by immunohistochemistry and sequencing) - MGMT promoter: Methylated (67% methylation by pyrosequencing) - EGFR: Amplified - EGFRvIII: Negative - TERT promoter: C228T mutation present - TP53: Wild-type - Ki-67 proliferation index: 34% - PTEN: Retained expression

Treatment Response: - 3-month MRI: No residual enhancement, complete radiographic response - 6-month MRI: Stable, no enhancement - 12-month MRI: Stable, minimal post-treatment changes - 24-month MRI: Stable, small gliosis at resection site - 36-month MRI: Stable disease - 48-month MRI (current, May 2024): Continues without progression

Current Status: The patient is now 76 years old, 48 months post-diagnosis, with no evidence of disease recurrence. Performance status remains excellent (ECOG 0-1) with complete resolution of left-sided weakness. Mild residual cognitive slowing managed with occupational therapy. He has returned to most daily activities including gardening and volunteer work.

Quality of Life: EORTC QLQ-C30 global health score: 78/100 (maintained above 70 throughout treatment). Neurocognitive assessment shows mild executive function decline but preserved independence in activities of daily living. Patient reports high satisfaction with treatment outcomes.

FDA Approval Status

Approved Treatment Regimen - The standard Stupp protocol (radiotherapy + concurrent and adjuvant temozolomide) is FDA-approved for newly diagnosed glioblastoma and represents the established standard of care.

Key Findings

This case exemplifies exceptional response and prolonged survival in an elderly glioblastoma patient treated with standard therapy. Several factors likely contributed to favorable outcome:

1. **Gross Total Resection:** >98% resection achieved with fluorescence guidance
2. **Favorable Molecular Profile:** MGMT promoter methylation (strongest predictor of TMZ response)
3. **Excellent Treatment Completion:** All 12 planned TMZ cycles completed without significant interruption
4. **Good Performance Status:** Maintained functional independence throughout treatment
5. **Multidisciplinary Management:** Coordinated neuro-oncology, radiation oncology, and neurosurgery care

This case challenges the sometimes nihilistic approach to treating elderly glioblastoma patients and demonstrates that age alone should not preclude aggressive multimodal treatment in appropriately selected patients with good performance status.

The MGMT methylation status proved highly predictive of this patient's exceptional response, reinforcing its role as the most important prognostic and predictive biomarker in glioblastoma management. The case supports routine molecular testing to guide treatment intensity discussions with elderly patients.

Citations

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Correspondence: Department of Neuro-Oncology, Regional Medical Center
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