ISSN: 2754-6691

Journal of Internal Medicine Research & Reports

SCIENTIFIC Research and Community

Case Report

Open Access

Cognitive Decline in an Elderly Patient with a History of Pernicious Anemia: an Unexpected Finding

Daniela Zermeño-Napolitano[1,2], Haiko Nellen-Hummel[1] and Rodrigo Villaseñor-Echavarri[1,2]*.

[1]Department of Internal Medicine, The American British Cowdray Medical Center, Mexico City, Mexico

[2]School of Medicine, Pan-American University, Mexico City, Mexico

***Corresponding author**
Rodrigo Villaseñor-Echavarri MD, Department of Internal Medicine, The American British Cowdray Medical Center, Mexico Vasco de Quiroga 154, Cuajimalpa, 05348, Mexico City, Mexico.

Received: March 28, 2026; **Accepted:** April 02, 2026; **Published:** April 13, 2026

Presentation

An 82-year-old woman presented with a two-week history of progressive cognitive decline. Her past medical history included well-controlled hypertension and pernicious anemia diagnosed six months earlier, confirmed by positive anti-parietal cell antibodies and treated with cyanocobalamin, currently on monthly maintenance. She reported generalized weakness, slowed thinking, memory loss, and language difficulties characterized by word-finding pauses and slow speech. She denied headache, urinary incontinence, and paresthesias.

Assessment

On neurologic examination, she was disoriented, with bradypsychia, bradylalia, facial unilateral hypoesthesia, symmetric proximal weakness of the upper limbs (4/5), and ataxic gait. Laboratory studies showed a hemoglobin level of 14.5 g/dL, with serum vitamin B12 and folate concentrations above the upper detection limit. Renal, hepatic, electrolyte, and thyroid function tests were within normal limits. Cerebrospinal fluid analysis showed no inflammation or malignant cells. Infectious studies, including viral serologies for hepatitis and HIV, VDRL, cerebrospinal fluid cultures, and molecular panels, were negative. Gadolinium-enhanced brain magnetic resonance (MRI) demonstrated diffuse white-matter hyperintensities and nodular lesions involving the corpus callosum, third ventricle, and right lateral ventricle (Figure 1).

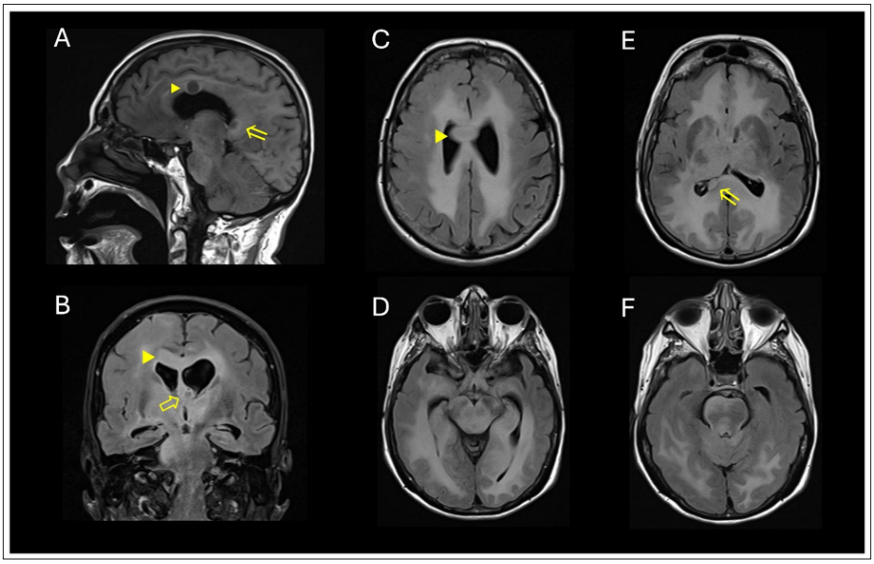

Figure 1: Sagittal T1 (A), Coronal T2 FLAIR (B), and Axial Images (C–F) Show Nodular Lesions in the Corpus Callosum (Arrowhead), The Third Ventricle (Hollow Arrow), and in The Periatrial Region of the Right Lateral Ventricle (Double Arrow). Marked Hyperintensity is also Seen in the Right Frontoparietal Subcortical White Matter, Mainly within the Deep Corona Radiata and Periventricular Regions (C–F), Extending to the Basal Ganglia, Thalami, and Internal and External Capsules (E), as well as the Midbrain (D), Pons, Cerebellar Peduncles (F), and Corpus Callosum (C)

Diagnosis and Management

Given the subacute cognitive decline and exclusion of metabolic, nutritional, infectious, and inflammatory causes, MRI findings prompted a stereotactic brain biopsy, revealing a hypercellular glial lesion with marked pleomorphism, frequent mitoses, and a molecular profile consistent with primary glioblastoma (Figure 2). A chemotherapy- and radiotherapy-based treatment plan was proposed; however, due to poor prognostic indicators, the patient elected to transition to palliative care. She was discharged with symptomatic management and home support, and passed away peacefully a few days later.

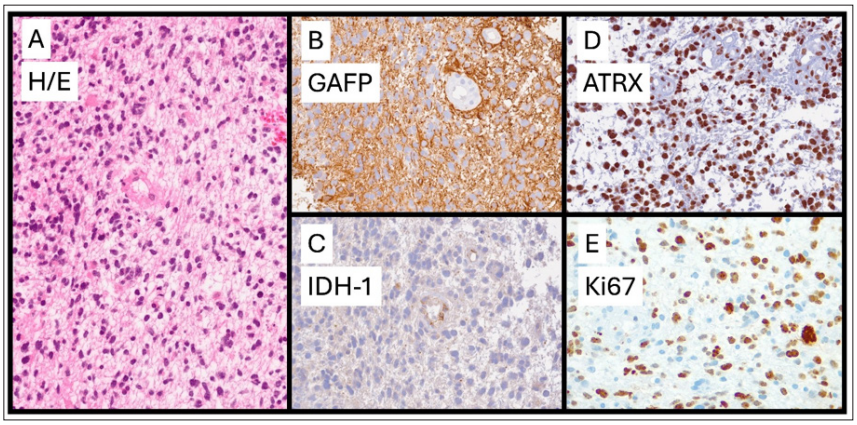

Figure 2: Histopathologic Analysis Shows a Hypercellular, Diffusely Infiltrative Glial Tumor with Marked Pleomorphism and Frequent Mitosis (H&E, A). GFAP Positive Confirming Glial Origin (B). IDH1 is Negative in Tumor Cells, indicating an IDH-Wild Type Profile (C). ATRX with Retained Nuclear Expression, Consistent with Non-Mutated Status (D). Ki-67 ≈50%, indicating High Proliferative Activity (E)

Discussion

Glioblastoma is the most common malignant brain tumor and the leading subtype of high-grade gliomas. Median age at diagnosis is 65 years, with peak incidence from 75 to 85. Clinical presentation is typically subacute and depends on tumor location, most often manifesting as headache, seizures, progressive cognitive decline, or focal neurologic deficits. Prognosis remains poor, with median survival under two years despite multimodal therapy, particularly in older adults [1,2]. Management is individualized based on functional status, comorbidities, and molecular profile, guided by functional status and O6-methylguanine-DNA methyltransferase (MGMT) methylation status. The standard initial approach consists of maximal safe surgical resection followed by radiotherapy and administration of adjuvant temozolomide [3].

Interestingly, some studies have reported an inverse association between pernicious anemia and glioblastoma risk [4]. A plausible pathophysiological explanation is that chronic vitamin B12 deficiency activates proapoptotic pathways and disrupts DNA synthesis, leading to cell-cycle arrest. In addition, the homocysteine accumulation characteristic of pernicious anemia promotes oxidative damage and reduces tumor cell survival. Notably, this patient developed both conditions almost concomitantly. It is possible that the molecular mechanisms proposed to confer protection were insufficient to suppress tumor development in this case, which presented aggressively and progressed rapidly.

This case highlights the importance of a structured, stepwise diagnostic approach to clinical síndromes-in this instance, rapidly progressive cognitive decline. Although the recent diagnosis of pernicious anemia initially raised concern for suboptimal response to intramuscular cyanocobalamin, inadequate dosing and concomitant folate deficiency were promptly excluded. Moreover, the diffuse white-matter involvement and callosal extension lead to the consideration of inflammatory, demyelinating, toxic, and lymphoproliferative disorders, reinforcing the need to avoid premature closure and to maintain a comprehensive diagnostic perspective throughout the evaluation. The atypical course ultimately prompted histopathological evaluation that revealed an uncommon presentation of primary glioblastoma, characterized by diffuse white matter involvement without a well-defined enhancing lesion.

Acknowledgements

The authors thank Dr. Saulo Mendoza Ramírez and Dr. Mónica Yareli Moreno Juárez, Department of Pathology ABC Medical Center, for their contributions to the patient's diagnostic evaluation.

Declarations

- Patient consent was waived as all identifying information was removed and anonymity was fully maintained.
- The authors report no conflicts of interest and received no financial support.
- Artificial Intelligence-assisted tools were used solely for grammar and language refinement, and not for content generation.

References

1. Tan AC, Ashley DM, López GY, Malinzak M, Friedman HS, et al. (2020) Management of glioblastoma: State of the art and future directions. CA Cancer J Clin 70: 299-312.
2. Chang SM, Parney IF, Huang W, Anderson FA Jr, Asher AL, et al. (2005) Glioma Outcomes Project Investigators. Patterns of care for adults with newly diagnosed malignant glioma. JAMA 293: 557-564.
3. Zarnett OJ, Sahgal A, Gosio J, Perry J, Berger MS, et al. (2015) Treatment of elderly patients with glioblastoma: a systematic evidence-based analysis. JAMA Neurol 72: 589-596.
4. Deng N, Agila R, He Q, You C, Zheng S, et al. (2025) Comprehensive causal analysis between autoimmune diseases and glioma: A Mendelian randomization study. Medicine (Baltimore) 104: e41815.