JGPEMN
ISSN 2091-279X
eISSN 2362-1168

CASE REPORT

Early diagnosis of grade-3 oligodendroglioma and its management: an uncommon tumor in an unlikely age: a case report

Anish Karna[1], Rajesh Yadav[1], Samir Kshetri[2]

[1]Medical officer, [2]DM Emergency Medicine Resident, Chitwan Medical College &Teaching Hospital, Bharatpur, Chitwan, Nepal

Date of submission: 9 Jun 2025

Date of acceptance: 16 Jul 2025

Date of Publication: 30 Jul 2025

Correspondence:
Dr. Anish Karna
Medical Officer, Chitwan Medical College & Teaching Hospital, Bharatpur, Chitwan, Nepal
Email: anishkarna8848@gmail.com

How to cite:
Karna A, Yadav R, Kshetri S. Early diagnosis of grade-3 oligodendroglioma and its management: an uncommon tumor in an unlikely age: a case report. J Gen Pract Emerg Med Nepal. 2025 Jun;12(19):63-66.

Online information
DOI:
https://doi.org/10.59284/jgpeman351

OPEN ACCESS

Abstract

Glioma, a type of primary brain tumor, often presents subtly but can progress silently if not caught early. This case highlights a young female who initially experience dull right-sided headache for over a week, later followed by sudden episodes of projectile vomiting and dizziness. CT scan revealed a suspicious frontotemporal mass, which was later diagnosed as Grade-3 oligodendroglioma through diagnostic and therapeutic right pterional craniotomy and immunohistochemistry. She underwent timely surgical intervention and is now receiving radiation therapy with government support. This case underscores the value of early diagnosis and coordinated care, especially in people with low socio-economic status.

Keywords: Early Diagnosis, Low Socio-economic Status, Oligodendroglioma, Young Age

INTRODUCTION

Gliomas are intrinsic central nervous system neoplasms derived from glial cells, which include astrocytes, oligodendrocytes, and ependymal cells. These tumors vary widely in aggressiveness and prognosis.[1] They account for approximately 30–40% of all primary brain tumors, with oligodendrogliomas comprising only 5–20% of gliomas, making them relatively uncommon within the spectrum of CNS malignancies.[1] Headache is one of the most common non-specific symptoms in patients with brain tumors; however, it has a very low positive predictive value.[2] Nausea and vomiting are common presenting symptoms in glioma patients and are often related to raised intracranial pressure or tumor-induced mass effect.[3] Early diagnosis of glioma provides a crucial window for timely intervention. It allows more effective treatment, preserves neurological function, improves quality of life, and may extend survival.[4]This case is reported due to the uncommon occurrence of a high-grade oligodendroglioma in a young adult and the diagnostic challenge it posed due to non-specific initial symptoms. It also highlights the importance of early neuroimaging, multidisciplinary care, and access to subsidized treatment in improving outcomes, especially in people with low socioeconomic status.

CASE REPORT

A 22-year-old female, referred case from local hospital, presented with a history of headache for 10 days, which was acute-in onset, dull aching, localized to the right temporal region, 7/10 in severity. The headache was non-radiating, without aggravating factors and temporarily relieved by over-the-counter paracetamol. One day before presentation, she developed projectile vomiting 8 times, containing food particles but not mixed with blood, bile, or foul odor. Vomiting was preceded by nausea. At presentation, she also reported right-sided ocular pain and dizziness. One year ago, she had mild myopia which was corrected with spectacles and head trauma which was treated conservatively. She denied any chronic illnesses or family history of neurological or oncological disease. There was no history of seizure, limb weakness, speech difficulties, altered sensorium, gait imbalance, or prior neurological illness, and fundal examination showed no evidence of papilledema. She consumed a mixed diet, did not smoke and drink alcohol occasionally. There was no exposure to radiation or toxic substances. On examination, she was alert, oriented, and stable with normal vital signs of HR:82 bpm, RR:16 breathe per minute, temperature: 97.6°F, BP: 110/70 mm of Hg, SpO_2: 98% in room air. Neurological examination was normal with of Glasgow coma scale of 15/15 with B/L pupil round, regular and reactive with no motor, sensory, or cranial nerve deficits. Other systemic examination of respiratory, cardiovascular, gastrointestinal and Genito-urinary revealed normal findings.

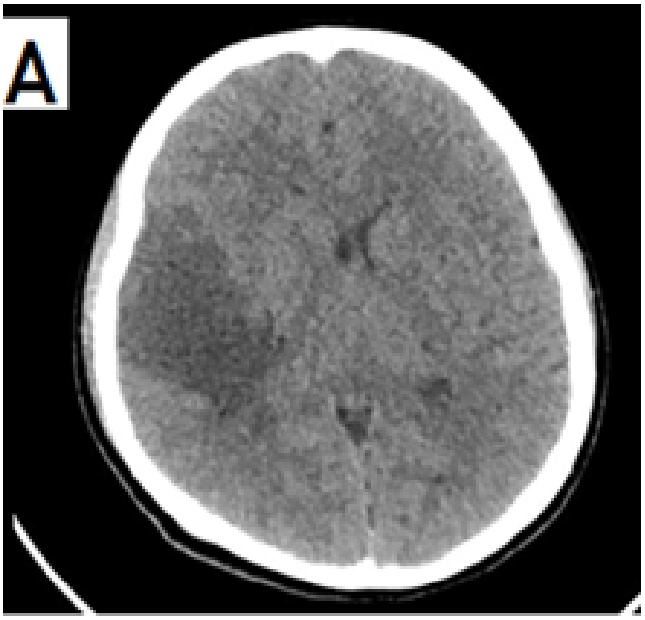

Figure 1(A). NCCT Head scan showed a hypodense lesion in the right parietal and temporal lobes causing mass effect and midline shift

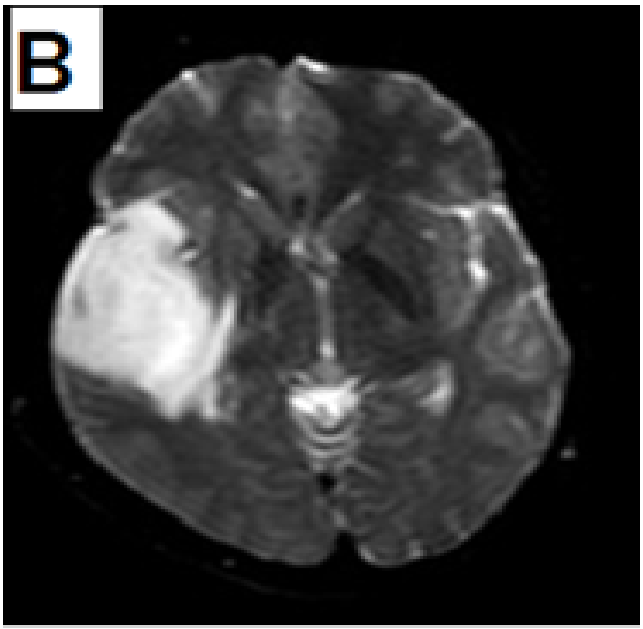

Figure 1(B). MRI brain revealed a minimally enhancing mass in the right frontotemporal lobes with increased Cho/NAA ratio and involvement of the right MCA branches, suggestive of low-grade glioma

MRI provides superior soft tissue contrast and is essential for detailed tumor characterization. However, a key challenge was that MRI findings were suggestive of a low-grade glioma, which later proved to be a Grade 3 oligodendroglioma on histopathology—underscoring the limitation of imaging alone in definitive tumor grading.

Further molecular studies were advised and limmunohistochemistry confirmed IDH1 positivity which confirmed IDH1 mutant Oligodendroglioma.

She underwent right pterional craniotomy with tumor excision. Initially, she presented to private hospital setting where the initial cost was high. Then she went to tertiary level government hospital where she was operated under the government scheme and is currently receiving external beam radiation therapy (total cumulative dose of 6400 rad) under government funding. After radio therapy, she is doing well with her symptoms but she is facing issues associated with radiotherapy like hair loss, low mood. She is performing her daily activities without external assistance. In this case, chemotherapy was not given due to clinical decision-making and financial constraints. While chemotherapy (e.g., PCV) is typically recommended in grade-3 oligodendroglioma, especially with confirmed 1p/19q co-deletion, it is not universally mandatory and can be individualized based on tumor biology, response to radiotherapy, and patient-specific factors.

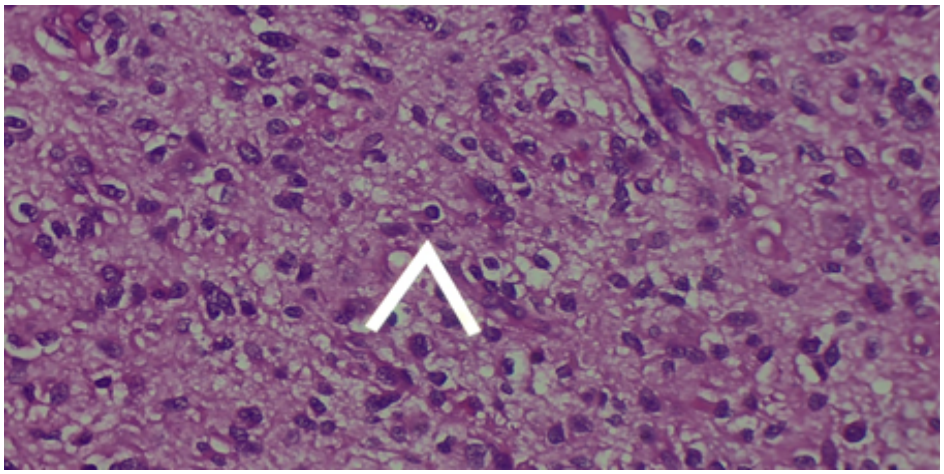

Figure 2 - Biopsy (Craniotomy with biopsy) Histopathology confirmed Grade 2 astrocytoma, and immunohistochemistry showed markers consistent with Grade 3 oligodendroglioma.

DISCUSSION

Oligodendrogliomas are characterized by mutations in the IDH1 or IDH2 genes and a co-deletion of chromosome arms 1p and 19q, which are associated with better prognosis and response to therapy.[5] The 2021 World Health Organization (WHO) classification of central nervous system tumors emphasizes the integration of molecular markers with histological features for accurate diagnosis. This approach ensures more precise prognostication and tailored treatment strategies. According to the WHO, the presence of IDH mutations and 1p/19q co-deletion defines oligodendrogliomas, distinguishing them from other gliomas.[5] Management of oligodendrogliomas typically involves maximal safe surgical resection followed by radiotherapy and, in certain cases, chemotherapy. The European Association for Neuro-Oncology (EANO) guidelines recommend this multimodal approach, especially for grade 3 tumors.[3] This case underscores the importance of early recognition of neurological symptoms, the role of advanced diagnostic modalities and the impact of socioeconomic factors on healthcare access. It also highlights the need for continued efforts to make comprehensive cancer care accessible to all, regardless of economic status.[6] This case was influenced by significant socioeconomic challenges. The patient initially sought care at a private hospital where surgery costs were high, which was unaffordable. She was referred to tertiary government institution, where treatment costs were substantially reduced. Limited financial resources delay access to timely diagnostics and restrict availability of advanced molecular testing. This highlights the critical role of public healthcare in ensuring equitable access to specialized treatment in people with low socio-economic status.

CONCLUSION

This case reminds us that even rare and typically age-specific diseases can break patterns. A young woman with subtle symptoms presented with headache and a single day of vomiting; walked into a local hospital and eventually unraveled a diagnosis most often seen in older adults: oligodendroglioma, Grade 3. Her journey reflects how early recognition, appropriate referrals, and multi-disciplinary care can shape outcomes even in people with low socioeconomic status. It also brings attention to a deeper issue — the quiet weight of socioeconomic barriers in accessing timely, specialized treatment. Despite financial hardship, this patient received surgical and radiotherapy interventions, showing how resilience, patient advocacy, and government-supported care can bridge gaps in equity. In essence, this isn't just a story about a tumor — it's a story about awareness, access, and hope, where medicine meets humanity.

She was diagnosed as a case of brain tumor at her young age which was overwhelming. She had been experiencing persistent headache and she thought something wrong in her body. Now, she is so grateful that her concerns were heard and early diagnosis and early treatment were made possible despite of low socioeconomic status.

DECLARATIONS

Acknowledgement
None

Conflict of Interest
None

Consent of the Study
A signed consent was taken from the patient regarding the publication of the case report.

REFERENCES

1. Louis DN, Perry A, Wesseling P, Brat DJ, Cree IA, Figarella-Branger D, et al. The 2021 WHO classification of tumors of

the central nervous system: a summary. Neuro-Oncol. 2021 Aug 2;23(8):1231–51.| DOI | PubMed | Google Scholar | Full Text |

2. Schmidt-Hansen M, Berendse S, Hamilton W. Symptomatic diagnosis of cancer of the brain and central nervous system in primary care: a systematic review. Fam Pract. 2015;32(6):618-23. | DOI | PubMed | Google Scholar | Full Text |
3. Weller M, van den Bent M, Hopkins K, Tonn JC, Stupp R, Falini A, et al. EANO guideline for the diagnosis and treatment of anaplastic gliomas and glioblastoma. Lancet Oncol. 2014 Aug;15(9):e395-403.| DOI | PubMed | Google Scholar | Full Text
4. Kumar N, Kumar R, Sharma SC, Mukherjee A, Khandelwal N, Tripathi M, et al. Impact of volume of irradiation on survival and quality of life in glioblastoma: a prospective, phase 2, randomized comparison of RTOG and MDACC protocols. Neuro-Oncol Pract. 2020 Jan 31;7(1):86-93. | DOI | PubMed | Google Scholar | Full text |
5. Cancer Genome Atlas Research Network, Brat DJ, Verhaak RGW, Aldape KD, Yung WKA, Salama SR, et al. Comprehensive, integrative genomic analysis of diffuse lower-grade gliomas. N Engl J Med. 2015 Jun 25;372(26):2481–98.| DOI | PubMed | Google Scholar | Full Text |
6. Bou Zerdan M, Assi HI. Oligodendroglioma: a review of management and pathways. Front Mol Neurosci. 2021;14:722396. | DOI | PubMed | Google Scholar | Full Text |