

ISSN 1220-8841 (Print)  
ISSN 2344-4959 (Online)

ROMANIAN  
NEUROSURGERY

Vol. XXXIX | No. 1

March 2025

A rare case of cerebral astroblastoma

Binoy Singh,  
Tamajyoti Ghosh,  
Biswajit Dey

DOI: 10.33962/roneuro-2025-014



# A rare case of cerebral astroblastoma

Binoy Singh, Tamajyoti Ghosh, Biswajit Dey

AIIMS Raipur, INDIA

## ABSTRACT

Cerebral Astroblastomas are rare central nervous system tumours constituting 0.45-2.8% of neuroglial tumours. Recent 2021 WHO classification of Brain tumours has described Astroblastoma as "other neuroepithelial tumours" with MN1 rearrangement. Because of its rare entity and indistinctive radiological and pathological features, diagnosis and further management continue to remain a challenge. Ependymoma and angiocentric glioma are the most important differential diagnoses of Astroblastoma and at times pre-operative differentiation is challenging. Here we discuss the case of a 22-year-old female with features of headache and vomiting. Histopathological examination revealed Cerebral Astroblastoma MN1 altered. Post-operative imaging suggested gross total resection of the tumour and the patient was subjected to radiotherapy of 54Gy in the tumour bed. 1-year follow-up of the patient showed no recurrence.

## INTRODUCTION

Cerebral Astroblastoma are rare Central nervous system tumour constituting 0.45-2.8% of neuroglial tumours (1). Recent 2021 WHO classification of Brain tumour has described Astroblastoma as "other neuroepithelial tumours" with MN1 rearrangement (2). Because of its rare entity and indistinctive radiological and pathological features, diagnosis and further management continues to remain a challenge (3). Here we discuss the case of a 22-year-old female with features of headache and vomiting. Histopathological examination revealed Cerebral Astroblastoma MN1 altered.

## CASE REPORT

We report the case of a 22-year-old female who presented with features of raised intracranial pressure. On clinical examination she was conscious, oriented with no focal neurological deficit. Her funduscopy was normal. Contrast Magnetic resonance study of her brain revealed T1 hypointense, T2 hyperintense lesion in the left parietal lobe.

The lesion was heterogeneously contrast enhancing with bubbly appearance within the lesion. GRE images were suggestive of punctate calcification.

A differential diagnosis of Supratentorial Ependymoma was made. The patient underwent Left parietal craniotomy and tumour excision.

---

**Keywords**  
brain tumour,  
immunohistochemistry,  
ependymoma

---



Corresponding author:  
**Tamajyoti Ghosh**

AIIMS Raipur, India

tamajyoti@gmail.com

**Copyright and usage.** This is an Open Access article, distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives License (<https://creativecommons.org/licenses/by-nc-nd/4.0/>) which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is unaltered and is properly cited.

The written permission of the Romanian Society of Neurosurgery must be obtained for commercial re-use or in order to create a derivative work.

ISSN online 2344-4959  
© Romanian Society of  
Neurosurgery

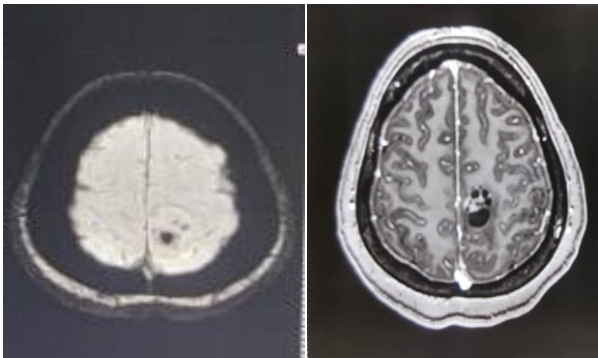


First published  
March 2025 by  
London Academic Publishing  
[www.lapub.co.uk](http://www.lapub.co.uk)

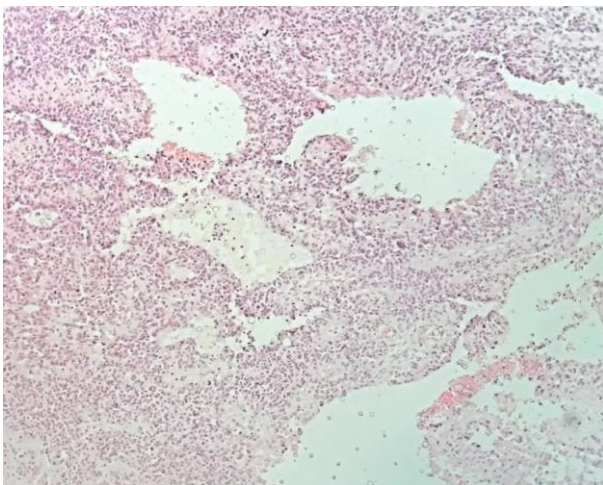
Tumour was vascular, soft to firm with well defined brain tumour interface. On histopathological examination perivascular rosettes with broad, thick process were seen.



**Figure 1a and 1b:** T1 hypointense and T2 hyperintense lesion in left parietal lobe

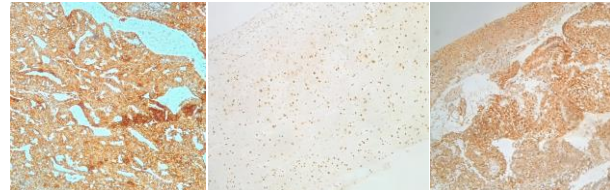


**Figure 2a and 2b:** Left parietal lesion showing punctate calcification and heterogenous enhancement with characteristic bubbly appearance



**Figure 3:** Histopathology showing Perivascular pseudorosettes with thick processes (H & E, 100x)

Immunohistochemistry study of the specimen showed GFAP, OLIG2, EMA and Vimentin positive.



**Figure 4:** IHC panel showing GFAP, OLIG2 and EMA positive

ATRX retained and absence of IDH1 and P53 mutation differentiated it from ependymoma. Fluorescence in situ hybridization (FISH) showed MN1 break apart in more than 30% of tumour cells. A final diagnosis of astroblastoma, MN1 altered was made. Post operative imaging suggested gross total resection of tumour and the patient was subjected to radiotherapy of 54Gy in the tumour bed. 1 year followup of the patient showed no recurrence.

#### DISCUSSION

Astroblastoma are extremely rare CNS tumours having bimodal age distribution incidence peak in between 5-10 years and then in young adults between 21-30 years (4). They are more frequently seen in females (1:11)(5). They are generally supratentorial in location more frequently found in frontal lobe (6). Headache, seizure, vomiting and focal neurological deficit are the most frequent presenting symptoms (7). Ependymoma and angiocentric glioma are the most important differential diagnosis of Astroblastoma and at times pre operative differentiation is challenging (8). Astroblastoma are exclusively supratentorial and peripheral in location (7). They are characteristically large, well demarcated, lobulated mass with areas of calcification having solid component with little vasogenic edema unlike ependymoma (9), (10). On Histological examination both astroblastoma and ependymoma have pseudorosettes but absence of fibrillary background and presence of short and broad cytoplasmic processes helps in differentiation of astroblastoma (9), (10).

They show IHC positivity towards GFAP, EMA, Pancytokeratin, Oligodendrocyte transcription factor 2, vimentin and negative for IDH1/2 and TP53 mutation (11). They are classified into low grade and high grade based upon presence of mitosis, Ki67 index, degree of cellular pleomorphism and areas of necrosis. High grade Astroblastoma have anaplastic nuclear features, increased mitosis >5 per 10 HPF, microvascular proliferation and necrosis with

palisading with Ki67 index >10% (12). Our case had areas of focal necrosis and frequent mitosis >5 per HPF with Ki67 index of >10% classifying it as high grade. 2021 WHO CNS classification has classified astroblastoma as separate entity of tumours under “other neuroepithelial tumours” (2). MN1 rearrangement has defined Astroblastoma as either MN1 altered where rearrangement is seen or Astroblastoma NOS where MN1 alteration cannot be tested (2). As these are rare tumour optimal management strategies still remains unclear. However total surgical resection is preferred followed by adjuvant radiotherapy in high grade lesions. Role of chemotherapy remains unclear (13).

### CONCLUSION

Cerebral Astroblastomas are extremely rare CNS neoplasms with non-distinct Radiological and pathological features thus making their diagnosis and further management quite challenging. Astroblastoma should be one of the differentials in young females with supratentorial neoplasms having MRI characteristics of Ependymoma. Histopathological examination and IHC and cytogenetics study plays a crucial role in diagnosis and differentiation of Astroblastoma.

### REFERENCES

1. Eom KS, Kim JM, Kim TY. A cerebral astroblastoma mimicking an extra-axial neoplasm. *J Korean Neurosurg Soc.* 2008;43:205–208. doi: 10.3340/jkns.2008.43.4.205.
2. Louis DN, Wesseling P, Aldape K, et al. cIMPACT-NOW update 6: new entity and diagnostic principle recommendations of the cIMPACT-Utrecht meeting on future CNS tumor classification and grading. *Brain Pathol.* 2020;30:844–856. doi: 10.1111/bpa.12832.
3. Agarwal V, Mally R, Palande DA, Velho V. Cerebral astroblastoma: A case report and review of literature. *Asian J Neurosurg.* 2012;7:98–100.
4. Shen F, Chen LC, Yao Y, Zhou LF. Astroblastoma: rare incidence and challenges in the pattern of care. *World Neurosurg.* 2014;82:0–7. doi: 10.1016/j.wneu.2014.03.008.
5. Port JD, Brat DJ, Burger PC, Pomper MG. Astroblastoma: Radiologic-Pathologic Correlation and Distinction from Ependymoma. *Am J Neuroradiol.* 2002;23:243–7.
6. Singh DK, Singh N, Singh R, Husain N. Cerebral astroblastoma: A radiopathological diagnosis. *J Pediatr Neurosci.* 2014;9:45–7.
7. Ahmed KA, Allen PK, Mahajan A, Brown PD, Ghia AJ. Astroblastomas: a surveillance, epidemiology, and end results (SEER)-based patterns of care analysis. *World Neurosurg.* 2014;82:e291–7.
8. Shen F, Chen L-c, Yu Y, Zhou L-F. Astroblastoma: Rare Incidence and Challenges in the Pattern of Care. *World Neurosurg.* 2014;82(1/2):e125–7.
9. Alaraj A, Chan M, Oh S, Michals E, Valyi-Nagy T, Hersonsky T. Astroblastoma presenting with intracerebral hemorrhage misdiagnosed as dural arteriovenous fistula: review of a rare entity. *Surg Neurol.* 2007;67:308–13.
10. Notarianni C, Akin M, Fowler M, Nanda A. Brainstem astroblastoma: a case report and review of the literature. *Surg Neurol.* 2008;69:201–5.
11. Dey B, Dutta S, Saurabh A, Raphael V, Khonglah Y. Cerebral Astroblastoma: A Rare Tumor. *Cureus.* 2021 Jul 12;13(7):e16323. doi: 10.7759/cureus.16323. PMID: 34395111; PMCID: PMC8355865.
12. Hammas N, Senhaji N, Alaoui Lamrani MY, Bennis S, Chaoui EM, El Fatemi H, Chbani L. Astroblastoma - a rare and challenging tumor: a case report and review of the literature. *J Med Case Rep.* 2018;12:102. doi: 10.1186/s13256-018-1623-1.
13. Salvati M, D'Elia A, Brogna C, et al. Cerebral astroblastoma: analysis of six cases and critical review of treatment options. *J Neurooncol* 2009; 93:369-78.