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CASE REPORT

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Cerebral astroblastoma radiologically mimicking pilocytic astrocytoma: A case report

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Abstract

Astroblastoma is a rare central nervous system tumor. We reported a case of a 24-year-old Nepalese woman with radiological features mimicking pilocytic astrocytoma which came out to be low-grade astroblastoma in histopathological and immunohistochemistry examination after total excision of the tumor.

KEYWORDS

astroblastoma, brain tumor, case report, histology, pilocytic astrocytoma

1 | INTRODUCTION

Astroblastoma is a rare primary tumor of the brain accounting for estimated 0.45%–2.8% of primary brain gliomas.[1,2] Exact prevalence of astroblastoma is not none due to its rarity. Its clinical features resemble other central nervous system tumors and is diagnosed by special histological and immuno-histochemical findings but still controversies exist because of insufficient clinicopathological data.[3] It is listed under "other neuroepithelial tumor" by WHO without a numeric grading.[4] Because of extreme rarity of tumor and non-specific radiological features, there is high chance of misdiagnosis.[5] In this case report, we report a case of astroblastoma with its clinical, radiological, and histopathological features along with management.

2 | CASE PRESENTATION

We report a case of a 24-year-old Nepalese woman who presented in our center with a history of headache and vomiting for 15 days, and her symptoms progressively worsened which is followed by one episode of loss of consciousness with abnormal body movement lasting five minutes. At the time of presentation, the patient was well oriented and alert with the Glasgow Coma Scale (GCS) E4V5M6. Sensory, motor, and cranial nerve examinations were unremarkable.

Non-contrast computed tomography (NCCT) of the head revealed hypodense, well-defined lesions in the right frontoparietal region with a small calcified area without solid components (Figure 1A). Magnetic resonance imaging (MRI) of her cranium showed hypointense

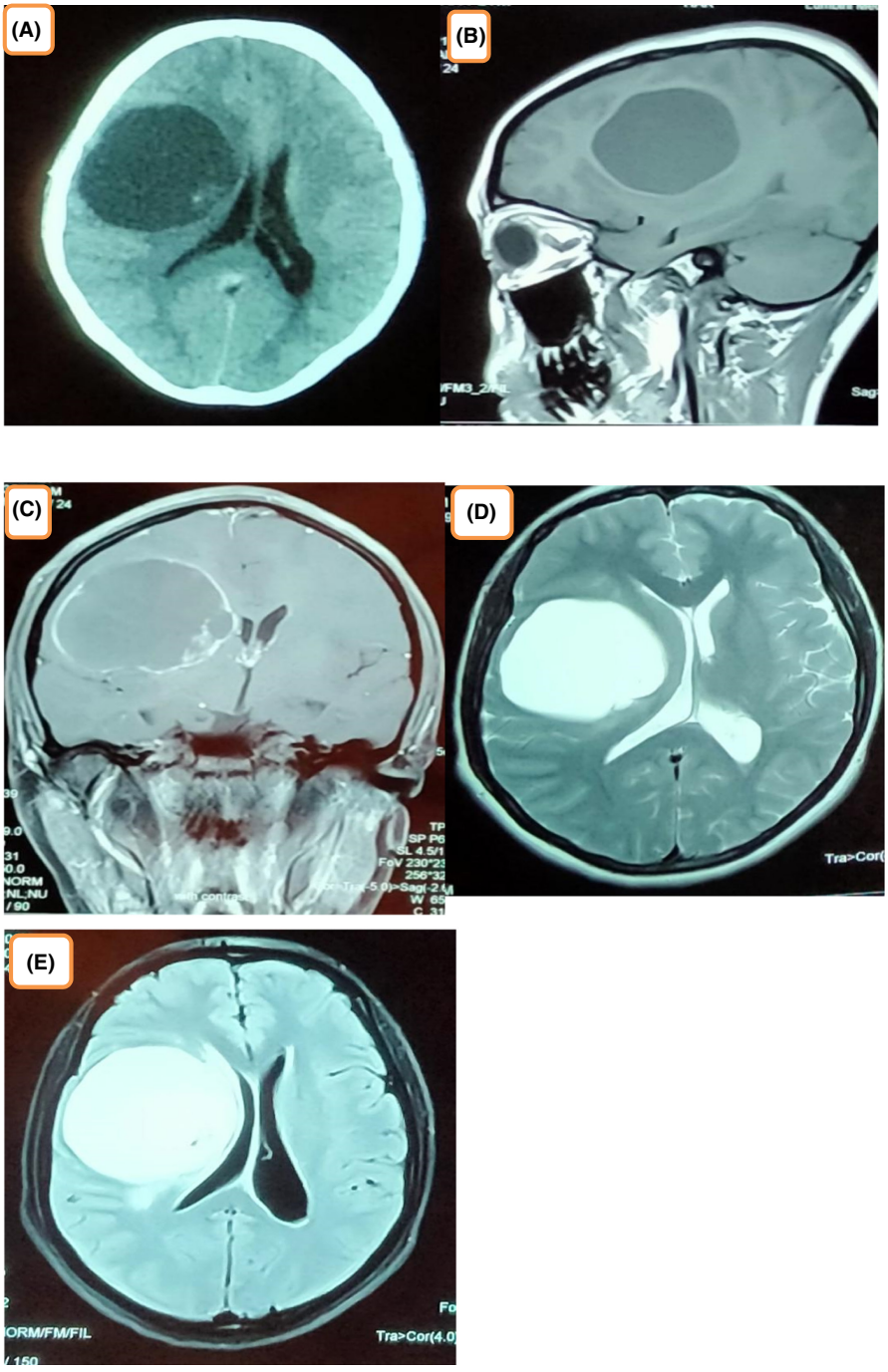

FIGURE 1 A. CT head showing hypodense, well-defined lesion with area of calcification; B, C. showing hypointense well-defined lesion with rim enhancement in T1-weighted sagittal and coronal magnetic resonance images; D. showing hyperintense well-defined lesion in T2-weighted axial images; E. FLAIR axial cut showing hyperintense lesion in fronto-temporal region

well-defined cystic lesion with rim enhancement in T1-weighted images and hyperintense strongly enhancing well-defined cystic lesion in T2 and FLAIR sequence in right frontoparietal region (Figure 1B-E), and radiological diagnosis of pilocytic astrocytoma was made.

By making a working diagnosis of pilocytic astrocytoma, she underwent right frontoparietal craniotomy. Following craniotomy, the dura flap was raised and the lesion was localized intra-operatively by ultrasonography, and a corte section was done. Intra-operationally grossly tumor was a well-defined, capsulated cyst containing straw-colored fluid and mural nodule medially involving part of the frontal and parietal lobe. Cyst wall was incised, and gross total excision of tumor was done. Excised tumor was sent for histopathological examination. She was discharged on the 10th postoperative day with GCS E4V5M6 with unremarkable sensory, motor, and cranial nerves examination and with postoperative CT findings without residual tumor and without compression effect (Figure 2). After 3 months of the surgery, the patient was doing well without any symptoms.

Histopathological examination showed a tumor composed of perivascular arrangement of tumor cells with central thickened sclerosed blood vessels. Those tumor

cells had indistinct cytoplasmic border with round-to-oval nuclei. Nuclear pleomorphism, mitotic activity, and necrosis were not seen (Figure 3).

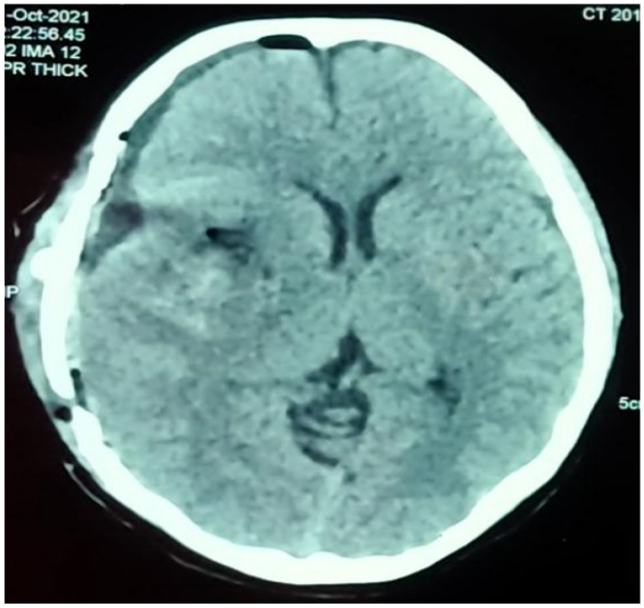

FIGURE 2 Showing postoperative image of NCCT head

Immunohistochemistry analysis revealed positive immunostaining for glial fibrillary acidic protein (GFAP) (Figure 4A) and S-100 (Figure 4B) but negative immune staining for epithelial membrane antigen (EMA) (Figure 4C) and pan-cytokeratin (Figure 4D). Gene analysis was not done. Based on these findings, a diagnosis of low-grade astroblastoma was made and was differentiated with pilocytic astrocytoma.

3 | DISCUSSION

Astroblastoma is one of the rarest central nervous system tumors. Exact clinicoepidemiological findings for the diagnosis and management of astroblastoma are insufficient to guide the maximal patient care due to its rarity and limited available study. It is most commonly seen in patients less than 5 years of age with mean and median age at diagnosis varying from 14.5 to 18 and 14 years respectively.[6-8] Astroblastoma shows female preponderance with female to male ratio of 1.7–8:1.[7,8]

Astroblastoma is commonly located in supratentorial region mainly in frontal region but it is also reported from parietal, occipital, intraventricular, brain stem, spinal cord,

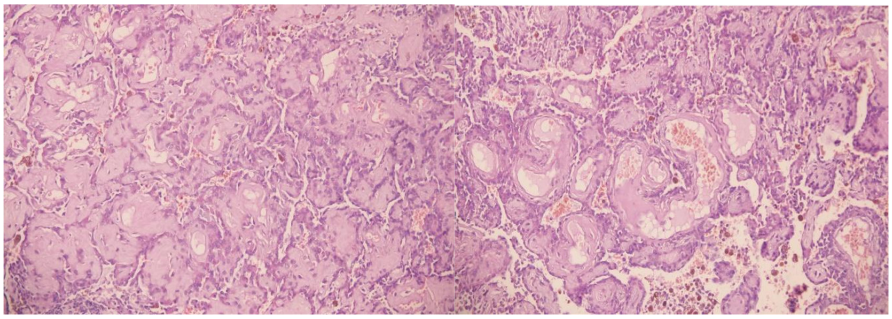

FIGURE 3 Tumor cells radiate to central sclerosed blood vessels (Hand E, 200×)

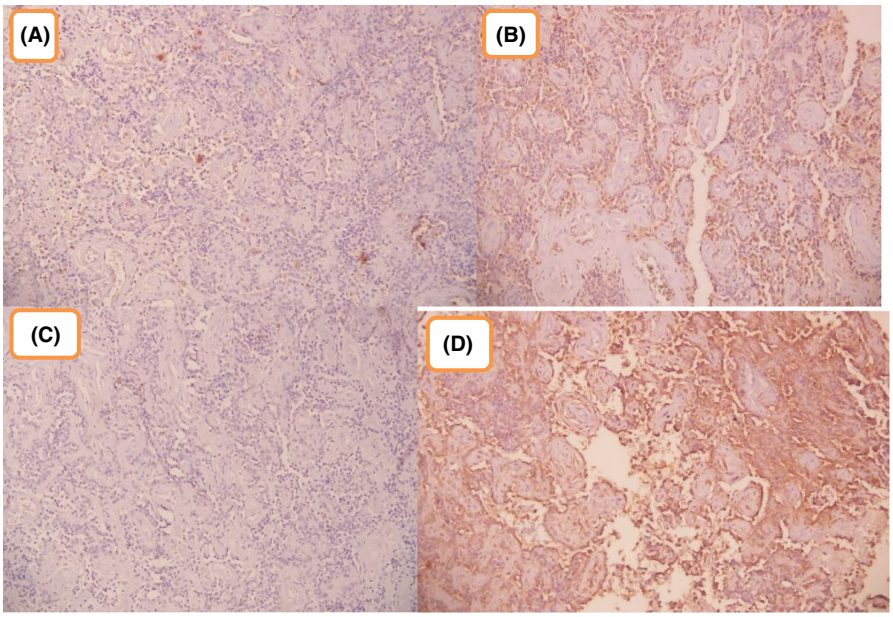

FIGURE 4 A. Immunohistochemistry showing EMA negative; B. Tumor cells strongly express GFAP (200×); C. Immunohistochemistry showing S-100 positivity (200×); and D. Negative immunostaining for pan-cytokeratin (200×)

and sometimes extra-axial.[2,9-14] Clinically, it is presented by different symptoms on the basis of the site where it is present. Common symptoms reported are headache, seizure, and vomiting.[1]

Radiologically, its reported characteristics of non-contrast head CT images are hyper-attenuated lesions including punctate calcification in most of the cases. Magnetic resonance imaging findings reported are mostly supratentorial, well-demarcated, mixed solid cystic, hypointense to isointense lesion in T1 and T2 sequences, which heterogeneously enhanced with slight to minimal peritumoral edema. It is also reported that multiple intra-tumoral cysts typically called bubbly appearance with rim enhancement are common radiological features.[8,15] In contrary to commonly reported findings, CT images of our reported case showing well-defined hypodense lesion with calcification, hypointense well-defined lesion in T1 sequence, and well-defined hyperintense strongly enhancing lesion in T2 and FLAIR sequence of MRI brain directed diagnosis more toward pilocytic astrocytoma. But, it lacks a solid component which is a common feature of pilocytic astrocytoma.[16,17]

Histopathological features composed of perivascular astroblast forming pseudorosette sometimes become confusing with ependymoma.[7,18] But, the characteristically reported findings of sclerosed thickened blood vessels typically described as hyalinized blood vessel core helps in making diagnosis of astroblastoma.[2]

According to published case reports, management is done by gross total excision and if not possible by subtotal excision with chemotherapy.[1,3,19] Recurrence is reported in sub-totally excised cases. It is also reported that radiotherapy following excision has a good outcome in high-grade tumors.[20,21] Thus, the outcome of totally excised tumor is better than that of sub-totally and prognosis of low-grade astroblastoma is better than that of high grade.

4 | CONCLUSIONS

Astroblastoma is a rare central nervous tumor, which presents clinically with similar symptoms as other brain tumors. Radiological findings are confusing and liable to misdiagnosis with other brain mass lesions, but diagnosis could be established by histopathological examination. The treatment was done by gross total excision in our case. Tumor characteristics, definite diagnosis, and specific management modalities of astroblastoma are still challenging, which needs further studies despite its rarity.

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CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

Padam Raj Joshi has taken history and performed physical examinations. Dr Gopal Sedain was involved in management of patient. Padam Raj Joshi and Sagar Babu Pandey were involved in writing the manuscript. Dr Gopal Sedain, Dr Usha Manandhar, and Saroj GC edited and revised the manuscript. All the authors read and approved the final version of the manuscript.

ETHICAL APPROVAL

None.

CONSENT

A written, informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

DATA AVAILABILITY STATEMENT

All the data generated during this study can be accessed through direct communication with the corresponding author and the agreement of all research team members.

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