

Astroblastoma with bone invasion

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ABSTRACT

Astroblastoma is a rare tumor belonging to the family of primary glial neoplasms. They are classified as neuroepithelial tumors; however, the World Health Organization grading is still not established. We report the case of a 4-year-old child who presented with an intra-axial space occupying lesion which turned out to be an astroblastoma. A complete excision was done and there was no recurrence at 20 months follow-up. This case report highlights the presence of such unusual tumor with invasion to the calvarium and reviews the current literature.

Key words: Astroblastoma, bone erosion, neuroepithelial tumor

Introduction

Astroblastoma is a rare neoplasm accounting for 0.45 to 2.8% of all primary glial tumors. They are classified as neuroepithelial tumors; however, the World Health Organization (WHO) grading is still not established due to lack of sufficient clinicopathologic data.^[1,2] The cell of origin and biologic behavior of astroblastoma is still debatable.^[3] The radiologic features are not distinct and the diagnosis is entirely based on histopathologic and immunohistochemical features. We present a case of astroblastoma with bone invasion.

Case Report

A 4-year-old girl presented with six-month history of irregularity of the bone over the left parietal region. She had occasional headache. She had a completely normal neurological examination. A small 2×2 cm depressed area was palpable below the left parietal eminence with overlying healthy skin.

Plain computed tomography (CT) scanning of the brain revealed an intra axial lesion in the left parieto occipital region. The lesion had an iso to hyperdense solid component

and a cystic component. Parietal bone erosion was seen. On contrast injection there was heterogenous enhancement of the solid component and of the cyst wall [Figure 1]. Magnetic resonance imaging (MRI) revealed a mixed intensity lesion in T1W [Figure 2] and T2W [Figure 3] images and with minimal perilesional edema in FLAIR sequences. There was heterogeneous enhancement after gadolinium injection. The picture resembled like a glioblastoma in adults except for the absence of significant edema.

Left parieto occipital craniotomy was performed. Thinning of the parietal bone with defect in the bone over the area of clinically felt depression was noted [Figure 4]. There was no attachment of the tumor to the underlying bone. Dura was papery thin. The tumor was grayish colored containing xanthochromic cystic fluid and was soft to firm in consistency [Figure 5]. A clear gliotic plane was seen around the tumor and the surrounding brain. Solid component was mixed with pockets of cystic component. Total excision of the tumor was done which was confirmed by postoperative contrast enhanced CT scan [Figure 6].

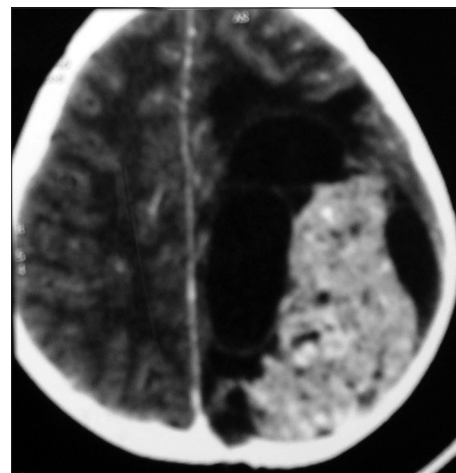


Figure 1: CT scan of the brain showing a large solid cystic lesion in left parieto occipital area enhancing on contrast

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On histopathology examination, the tumor showed predominant rosettoïd arrangement of the cells with marked areas of hyalinization [Figure 7]. The cytoplasmic processes were shorter and stouter than those of ependymal rosettes.

The nuclei showed coarse chromatin pattern. Focal areas showed necrosis, cellular pleomorphism with mitotic activity. The tumor cells showed reactivity for Vimentin, S-100 and GFAP, whereas EMA was negative. Ki67 proliferation index was

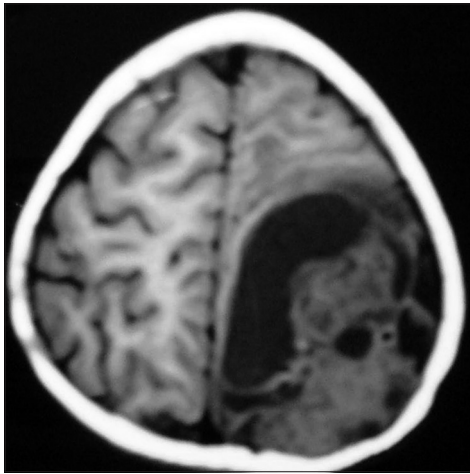


Figure 2: T1 W MRI of brain, axial images showing solid cystic lesion, solid component being iso to hyper intense

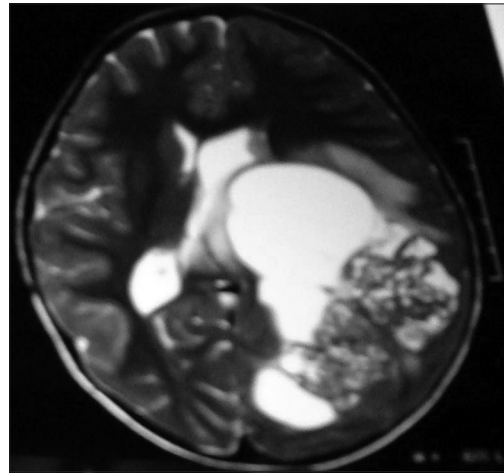


Figure 3: T2 W MRI of brain, axial section showing solid cystic lesion, solid component being hypo to isointense

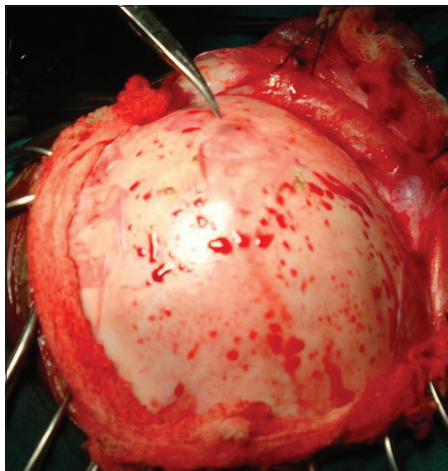


Figure 4: Intraoperative picture showing the bony defect

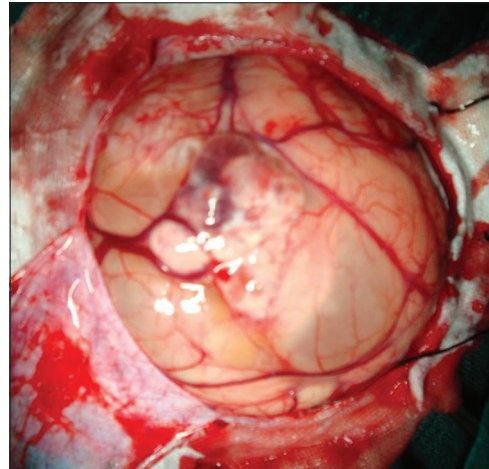


Figure 5: Intra operative picture showing intra axial solid cystic tumor on the surface

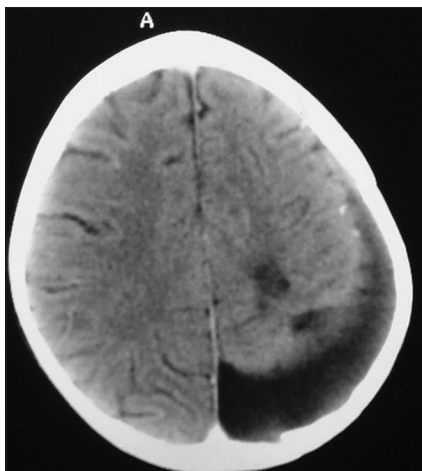


Figure 6: Post operative contrast CT scan of brain

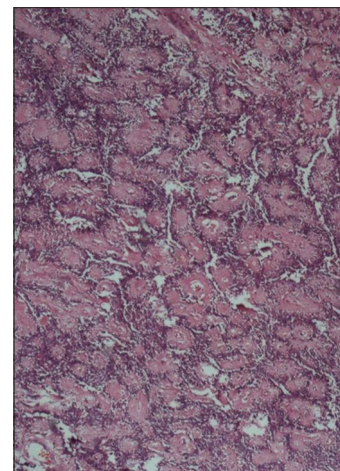


Figure 7: Photomicrograph of the tumor showing astroblastic rosettes

15%. On the basis of these features it was diagnosed as high grade astroblastoma. Patient is doing well after 18 months of follow-up.

Discussion

After its first description by Bailey and Bucy, there have been various reports of astroblastoma in literature. It is usually supratentorial in location; however, it has also been reported in unusual sites like, brainstem and cerebellum.^[4,5] Astroblastomas are reported frequently in older children and young adults; however, it has also been reported in pediatric population.^[4,6]

In MRI, these tumors are cystic and solid with characteristic bubbly appearance of the solid component.^[7] Conventionally these tumors show little peritumoral edema due to lack of local infiltration, however, high grade tumors can show infiltration into the surrounding brain.^[2] The present case also showed similar radiologic features.

Ependymoma and papillary meningioma form the most important differential diagnosis on morphology. The cells of astroblastoma show short stumpy cytoplasmic processes unlike the thin and long processes of ependymomas. Astroblastomas show immunopositivity for GFAP and S-100 and are usually negative for EMA which further differentiates them from ependymomas.^[8] However, focal expression of EMA has been reported in some astroblastoma.^[9] Papillary meningioma can be differentiated by negativity for GFAP and vimentin positivity. Certain tumors, particularly glioblastomas, can show focal astroblastic pattern. So the diagnosis of astroblastoma should be reserved for tumors showing diffuse morphology of astroblastoma.

Astroblastomas are divided into low grade and high grade tumors, wherein the later ones show mitosis, vascular proliferation, and pseudopallisading necrosis. The high grade tumors are difficult to be differentiated from glioblastomas. In the present case, diffuse pattern of rosettes with hyalinization and reactivity for GFAP and S100 favored a diagnosis of high

grade astroblastoma over glioblastoma. Interestingly, the present tumor showed invasion into the bone which is unusual and not reported in astroblastomas earlier. Conversion of astroblastoma to glioblastoma and gliosarcoma is also known.^[3]

Complete surgical resection remains the most important prognostic and predictive factor for astroblastoma. Patients in whom total resection could not be achieved are subject to chemotherapy or radiotherapy. Radiotherapy has an established role in the management of high grade astroblastomas when compared to the low grade tumors.

Report of such rare pathologies brings awareness of such cases and improves our index of suspicion besides appropriate prognostication and management tricks.

References

1. Louis DN, Wiestler OD, Cavenee WK (Editors). WHO classification of tumors of the central nervous system. 4th ed. Lyon: IARC; 2007.
2. Salvati M, D'Elia A, Brogna C, Frati A, Antonelli M, Giangaspero F, *et al.* Cerebral astroblastoma: Analysis of six cases and critical review of treatment options. *J Neurooncol* 2009;93:369-78.
3. Bonnin JM, Rubinstein LJ. Astroblastomas: A pathological study of 23 tumors, with a postoperative follow-up in 13 patients. *Neurosurgery* 1989;25:6-13.
4. Grotts BF. Astroblastoma of the cerebellum in an infant; Report of a case. *Arch Pediatr* 1949; 66:283-8.
5. Notarianni C, Akin M, Fowler M, Nanda A. Brainstem astroblastoma: A case report and review of the literature. *Surg Neurol* 2008;69:201-5.
6. Mastrangelo S, Lauriola L, Coccia P, Puma N, Massimi L, Riccardi R. Two cases of pediatric high-grade astroblastoma with different clinical behavior. *Tumori* 2010;96:160-3.
7. Port JD, Brat DJ, Burger PC, Pomper MG. Astroblastoma: Radiologic-pathologic correlation and distinction from ependymoma. *AJNR Am J Neuroradiol* 2002;23:243-7.
8. Pizer BL, Moss T, Oakhill A, Webb D, Coakham HB. Congenital astroblastoma: An immunohistochemical study. Case report. *J Neurosurg* 1995;83:550-5.
9. Brat DJ, Hirose Y, Cohen KJ, Feuerstein BG, Burger PC. Astroblastoma: Clinicopathologic features and chromosomal abnormalities defined by comparative genomic hybridization. *Brain Pathol* 2000;10:342-52.

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