tigation in suspected PML is warranted, and if confirmed, early intervention coupled with pre-emptive management to reduce IRIS may permit a benign PML disease course and clinical outcomes. IRIS management may need to be very prolonged, in this case continuing beyond 10 months.

Conflicts of Interest/Disclosures

Jason Burton has received speaker honoraria and membership of scientific advisory boards from Bayer Schering, Biogen-Idec, Novartis, Merck Serono and Sanofi-Genzyme. William M. Carroll received speaker honoraria and membership of scientific advisory boards from Bayer Schering, Novartis, Merck Serono, Sanofi, Biogen-Idec and CSL. Allan G. Kermode received speaker honoraria and scientific advisory board fees from Bayer, Biogen-Idec, Novartis, Sanofi-Aventis, Merck, Sanofi-Genzyme, Innate Immunotherapeutics and CSL. The other authors declare that they have no financial or other conflicts of interest in relation to this research and its publication.

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Hemorrhage in astroblastoma: An unusual manifestation of an extremely rare entity

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ABSTRACT

Astroblastoma is a rare tumor of glial origin with characteristics of both astrocytoma and ependymoma. It is usually seen in children and young adults, and is peripherally located, well circumscribed, of solid-cystic composition and with heterogeneous contrast enhancement. Histopathology reveals perivascular pseudorosette formation and thick hyalinised vessels. Hemorrhage in astroblastoma is unusual and rarely described in literature. We report two patients with astroblastoma who presented with hemorrhage and discuss the natural history, radiological findings, pathophysiology of hemorrhage and histopathological characteristics. We emphasize the importance of early suspicion in peripherally located lesions with bleeding.

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1. Introduction

Astroblastoma is an extremely rare tumor of glial origin that affects children and young adults and is usually supratentorial in location, solid-cystic, non-encapsulated, and peripherally located, with varying degrees of necrosis. Hemorrhage can rarely occur in these tumors and unleash rapid proliferative potential [1]. We present two patients with astroblastoma with hemorrhage and discuss the natural history, radiological and histopathological features and mechanism of hemorrhage in this rare disease.

2. Patient 1

A 30-year-old woman presented with sudden onset headache, altered sensorium and right sided weakness for 1 day. Examination revealed right sided weakness grade 4/5 and papilloedema. Contrast enhanced MRI revealed a left frontal lesion with acute bleeding. The lesion was hypointense on T1-weighted imaging with dense hyperintense blood in the surrounding areas, and was isointense on T2-weighted imaging. The lesion had dense contrast enhancement and edema was profuse on T2-weighted and fluid attenuated inversion recovery imaging (Fig. 1). The patient was taken for craniotomy and intraoperatively the tumor was firm, vascular, had a well-defined plane of cleavage, with evidence of bleeding in the form of clots. Histopathology showed low grade astroblastoma. MRI 6 months later showed no evidence of recurrence.

3. Patient 2

An 11-year-old boy presented with focal seizures on the left side of his face and hand 3 days previously. On examination the patient was conscious with no focal deficits. MRI of the brain (Fig. 2) revealed a lobulated extra-axial lesion in the right

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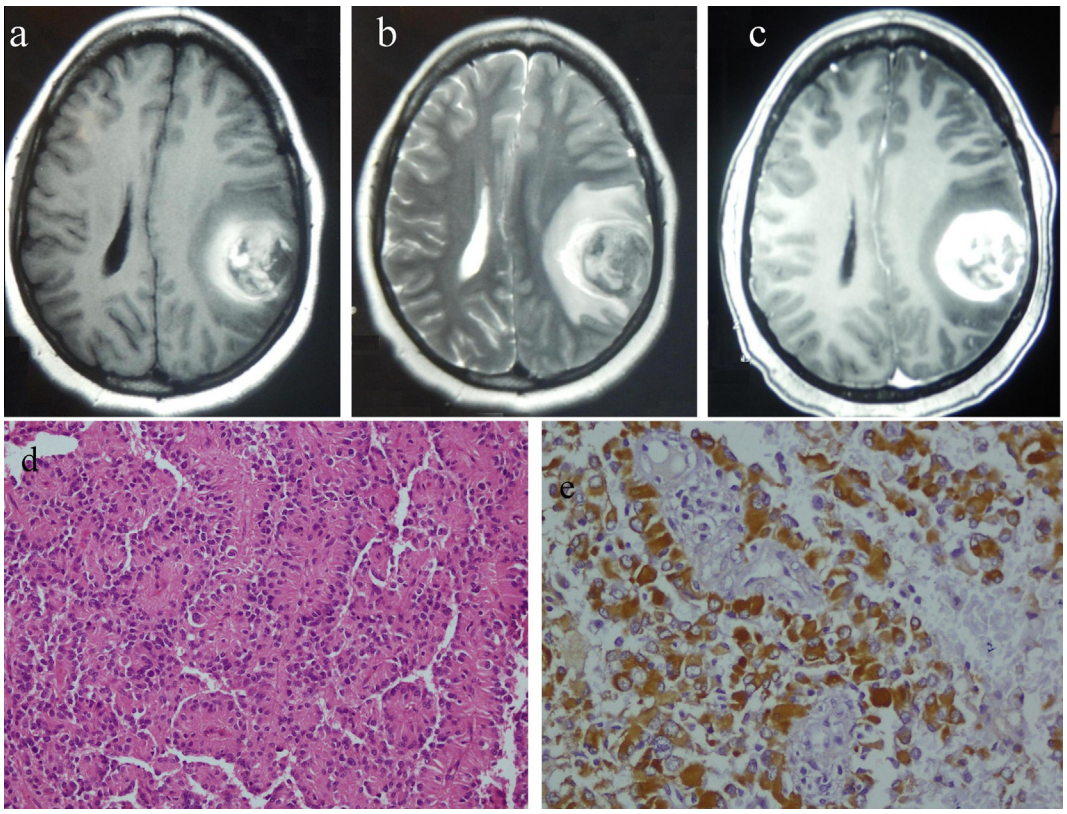

Fig. 1. Patient 1. Axial MRI of the brain showing left high posterior frontal well-defined spherical lesion isointense to hyperintense on T1-weighted imaging (a), isointense with surrounding hyperintense edema on T2-weighted imaging (b), and dense contrast enhancement (c). (d) Histopathological examination of the surgical specimen. Tumor cells arranged around blood vessels with a pseudopapillary pattern, cells have stout cytoplasmic process radiating from blood vessels (hematoxylin and eosin, original magnification ×200). (e) Tumor cells show strong glial fibrillary acidic protein expression (original magnification ×400).

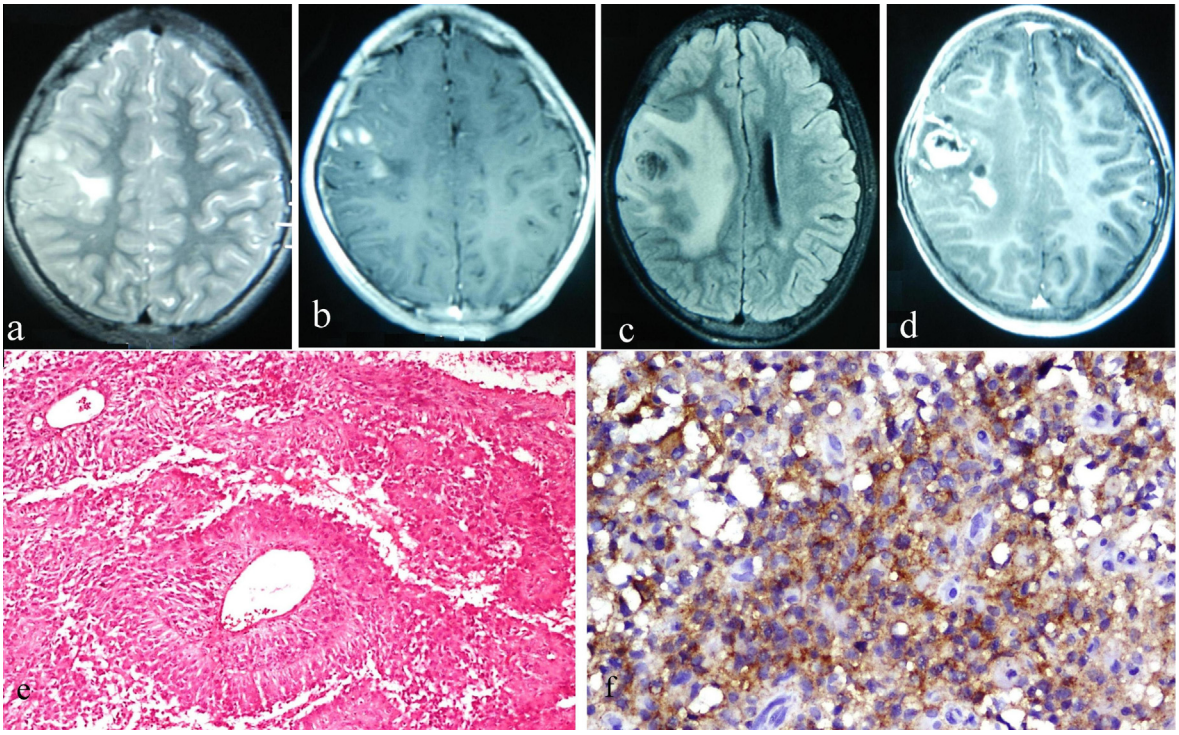

Fig. 2. Patient 2. Axial MRI of the brain showing right frontoparietal peripherally located lesion hyperintense on T2-weighted imaging (a), and with heterogeneous contrast enhancement with hyperintensity suggestive of haemorrhage (b). Follow-up MRI at 6 months showing recurrent lesion with surrounding hyperintensity on fluid attenuated inversion recovery image (c), and heterogeneous contrast enhancement with perilesional edema (d). (e) Histopathological examination of the surgical specimen showing perivascular arrangement of tumor cells, which have short and stout processes (hematoxylin and eosin, original magnification ×100). (f) Tumor cells show epithelial membrane antigen positivity (original magnification ×400).

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