Lobar haemorrhagic mass in a young girl with neurofibromatosis type 1

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DESCRIPTION

A 9-year-old girl with neurofibromatosis type 1 (NF-1) presented with sudden onset neurological deterioration following a 2-day history of headache. She was comatose on arrival with right third nerve palsy and contralateral hemiparesis. A head CT revealed a large right frontal acute haemorrhagic lesion with midline shift and uncal herniation (figure 1). The patient underwent emergent decompressive craniotomy and resection of the mass lesion where, the pathology demonstrated a highly cellular glial tumour with extensive nuclear pleomorphism and increased mitotic index consistent with a diagnosis of high-grade glioma (figure 2).

The differential diagnosis of an acute non-traumatic cortical haemorrhage in a child with NF1 includes aneurysm, haemorrhagic transformation of an ischaemic stroke and tumour. While majority of parenchymal tumours in NF-1 are low-grade astrocytomas, the rapid progression of symptoms in association with cerebral haemorrhage supported the diagnosis of a high-grade neoplasm.

NF-1 is a genetic tumour syndrome in which the neurofibromin, one of the main Ras-GAP proteins, is silenced on chr 17q11.2. Ras-GAP proteins activate Ras-GTP-hydrolase, inactivating the Ras signalling pathway that promotes cell proliferation. While low-grade astrocytomas are most commonly associated with NF-1, they are generally not haemorrhagic. Malignant gliomas have been rarely reported in children with NF-1.[1 2] Experiments in animal models suggest that early inactivation of the P53 tumour suppressor gene may act in synergy with downstream Ras pathways to promote high grade transformation.[3] Our case demonstrates the rare association of high-grade tumours with NF-1 and expands the differential diagnosis of haemorrhagic lesions in the patient population.

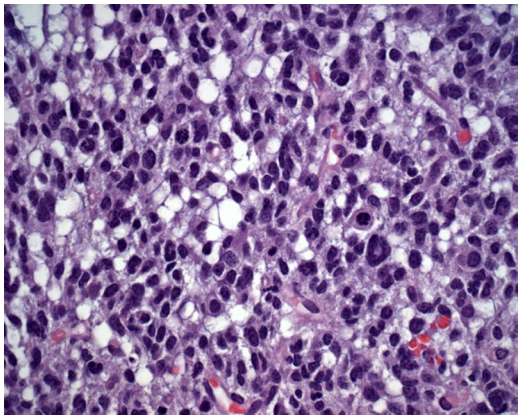

Figure 2 H&E-stained biopsy specimen demonstrates a glial tumour with extensive nuclear pleomorphism and brisk mitotic activity in a microcystic background consistent with diagnosis of a high-grade glioma.

Learning points

- Brain tumours in children may present with intracranial haemorrhage.
- High-grade glioma is a rare tumour in association with neurofibromatosis type 1 and should be included in the differential diagnosis

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

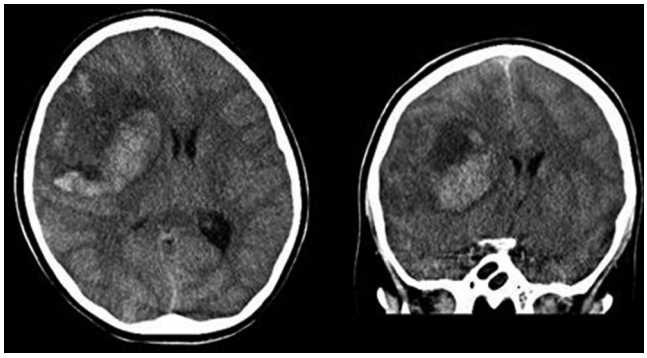

Figure 1 Preoperative head CT demonstrating a large right frontal lobar heterogeneous haemorrhage with acute and subacute components without oedema, an 8 mm midline shift and uncal herniation (right).

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REFERENCES

1 Huttner AJ, Kieran MW, Yao X, *et al*. Clinicopathologic study of glioblastoma in children with neurofibromatosis type 1. *Pediatr Blood Cancer* 2010;1:890–6.
2 Distelmaier F, Fahsold R, Reifenberger G, *et al*. Fatal glioblastoma multiforme in a patient with neurofibromatosis type 1: the dilemma of systematic medical follow-up. *Childs Nerv Syst* 2007;23:343–7.
3 Zhu Y, Guignard F, Zhao D, *et al*. Early inactivation of p53 tumor suppressor gene cooperating with NF1 loss induces malignant astrocytoma. *Cancer Cell* 2005;8:119–30.