

Short report

Long term survival with early childhood intracerebral tumours

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SUMMARY Three young adults are described who presented during early childhood with a seizure disorder due to an underlying intracerebral tumour. The tumours were excised incompletely 14-19 years later. The histological findings were those of a temporal lobe benign capillary haemangioblastoma (Case 1), parietal lobe subependymoma (Case 2), and parietal lobe ganglioglioma (Case 3). After a mean period of follow-up of 22 years (range 18-26), only mild residual physical disabilities exist in each patient. These three cases illustrate (1) the need promptly to investigate children who present with focal seizures or whose EEG shows definite focal abnormalities, (2) the relevant investigations should include cranial CT or MRI in such cases and (3) that certain supratentorial tumours have a favourable outcome due to their benign biological behaviour rather than their location.

Epilepsy in children is rarely due to an underlying brain tumour (0.2% of cases).¹ However, 15% of children with supratentorial tumours will present with seizures as the initial symptom² and the frequency of seizures rises with tumour growth so that ultimately, seizures occur in about 50% of such patients.³ The most common seizure types are complex or simple partial seizures and the most common tumour site for producing seizures is the temporal lobe.³

The diagnosis of brain tumour usually implies progressive disability and ultimate demise within months to a few years. This paper describes three young adults who each presented during early childhood with a seizure disorder as a manifestation of an intracerebral tumour that was not diagnosed until the second or third decade.

Case reports

Case 1: Left temporal lobe benign capillary haemangioblastoma

A 26 year old man experienced a generalised seizure of tonic-clonic type at 2 years of age and re-presented 4 years later with simple right sided motor seizures. Physical examination was normal. Serial EEGs showed left temporoparietal slow wave activity and frequent spike and slow wave complexes.

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Carotid angiography and air encephalography were non-diagnostic.

At 20 years of age his neurological examination had remained normal except for mild right central facial weakness and cranial CT showed an extensive, partly calcified and partly cystic area in the left posterior temporal region causing ventricular displacement. When 21 years of age he suffered the acute onset of a left occipital headache, vomiting and drowsiness. Bilateral papilloedema was present. An emergency subtotal left temporal lobectomy was performed. Microscopically, the tumour consisted of a fine meshwork of blood spaces and tufts of capillaries interspersed amongst polygonal stromal cells with prominent foamy cytoplasm (fig 1). The appearances were those of a benign capillary haemangioblastoma.

The patient is now 27 years of age and taking three anticonvulsants. He has residual bilateral optic atrophy, a right homonymous hemianopia and mild right central facial weakness. Cranial CT shows an area of low attenuation in the left temporal region and a small central contrast-enhancing nidus, representing residual tumour.

Case 2: Right parietal lobe subependymoma

A 21 year old woman was noted to have a left hemiparesis at the age of 16 months. At five years of age she developed simple partial left sided motor seizures. Cerebral angiography and pneumoencephalography findings suggested that she had a right frontoparietal congenital porencephalic cyst.

At 15 years of age she experienced the sudden onset of neck pain and stiffness with further progression of her left hemiparesis. Cranial CT revealed evidence of haemorrhage into one of the cysts. A right temporoparietal craniotomy was performed and 40 mls of dark fluid was aspirated from a large cyst in the right inferior frontal pole. Microscopically, much

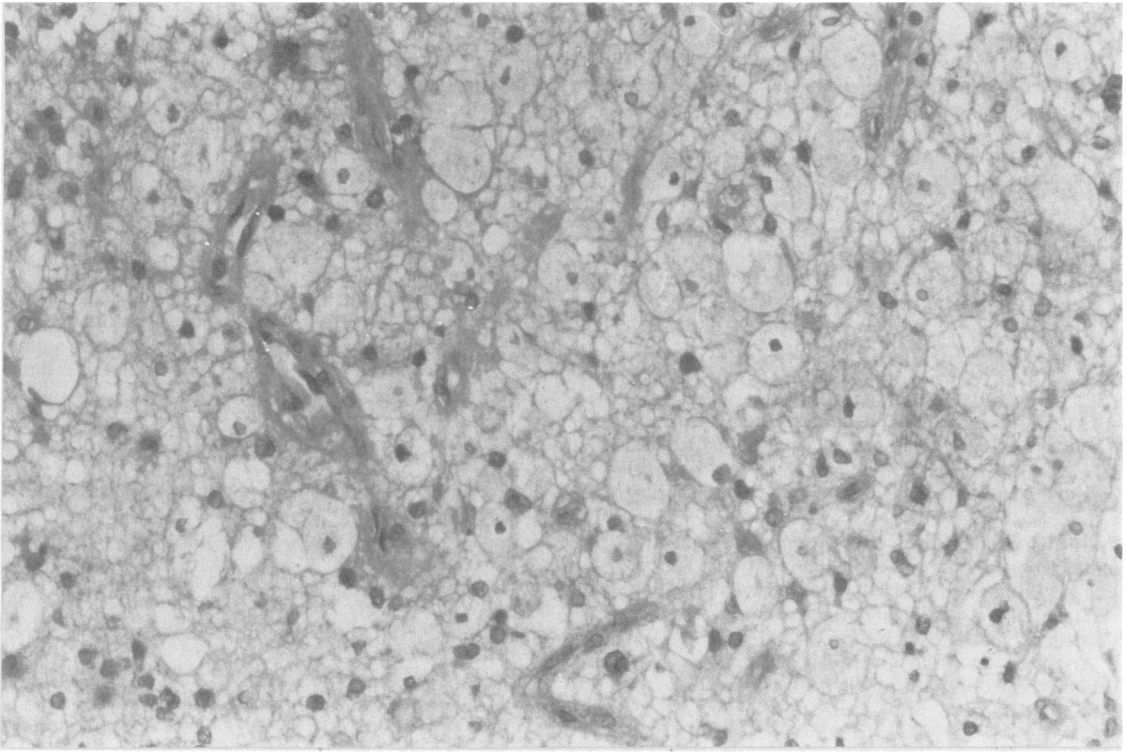


Fig 1 *Capillary haemangioblastoma* $\times 250$ (H&E). A fine network of capillaries are seen on a background of foamy stromal cells.



Fig 2 *Subependymoma* $\times 100$ (H&E). A cyst lined by relatively well differentiated ependymal cells is seen at the top of the section (arrow). The subadjacent regions show astrocytic differentiation.

of the tumour consisted of a large organised thrombus but within the tumour large areas of well differentiated astrocytes were present, in some areas forming poorly demarcated pseudorosettes around blood vessels. The cysts walls were lined by well differentiated columnar ependymal epithelium which, in some sections gave way to more atypical pseudostriated epithelium and in others to frankly bizarre cells which bore little resemblance to ependyma (fig 2). The histological appearances were those of a subependymoma.

The patient is now 21 years of age and her seizures are well controlled with carbamazepine. She has a mild left hemiparesis only and recently delivered a normal child without complication.

Case 3: Right parietal lobe ganglioglioma

A 21 year old man suffered from generalised seizures of tonic-clonic type at 3 and 12 months of age. At age 3 years an EEG showed focal slow wave activity over the right parietal-occipital region. Physical examination and skull radiographs were normal.

At nine years of age complex partial seizures developed and a right parietal spike wave focus was present on the EEG. Cranial CT showed a mixed cystic and calcified lesion in the right parieto-occipital region which remained unchanged two years later.

At age 18 an elective right parieto-occipital craniotomy was performed with incomplete resection of a large multicystic mass lesion. Microscopically, the most prominent

cellular components of the tumour were mature ganglion cells with prominent Nissl substance which stained positively for neuron specific enolase and negatively for glial fibrillary acid protein. In some areas the ganglion cells were numerous upon a scanty background stroma of spindle cells (fig 3) while in other areas the neuronal element was sparse with a marked proliferation of cells resembling well differentiated astrocytes. The histological appearances were those of a ganglioglioma.

The patient is now 22 years of age and a science technology student. He continues to suffer complex partial seizures which are incompletely controlled with phenytoin and carbamazepine. His neurological examination remains normal and cranial CT shows no change in size of the residual multicystic tumour.

Discussion

Benign capillary haemangioblastomas (BCH) usually arise in the cerebellum (Lindau tumour) and less commonly in other parts of the hindbrain and spinal cord. It is extremely rare for them to occur in the cerebral hemispheres,⁴ as in case 1. They may be linked with angiomas of retinae (von Hippel's disease) or non-neoplastic congenital cysts of the pancreas or kidneys (Lindau's syndrome).⁵ In a 5 to 20 year follow-up study of BCH, 85% of patients were alive and well.⁶

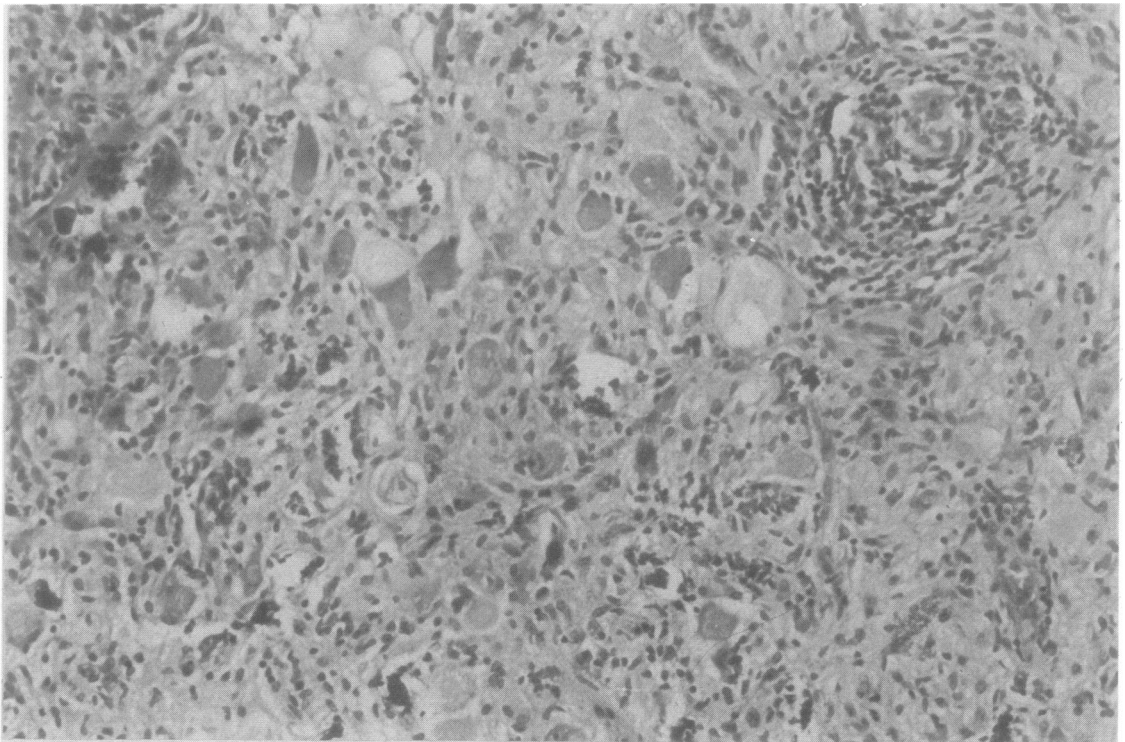


Fig 3 *Ganglioglioma* × 100 (H&E). Irregularly orientated neurons are seen upon a sparse glial background.

Although case 1 had clinical and EEG evidence of left hemisphere dysfunction from the age of six years, the diagnosis of tumour was not made until CT became available. It is now seven years since neurosurgical decompression of an abrupt haemorrhage into the tumour and only a small, very slowly growing nidus of residual tumour remains.

Subependymomas usually arise in the walls of ventricles, particularly the fourth ventricle. They are considered to be the most benign form of glial neoplasm, almost devoid of active growth.⁷ Clinical presentation may follow haemorrhage into the tumour, as in case 2, or obstruction to CSF flow. Despite clinical evidence of right hemisphere dysfunction at age 16 months in case 2 it was not until she was 15 years of age that the diagnosis was prompted by a haemorrhage into the tumour. Since neurosurgical decompression seven years ago she has continued to lead a normal life, affected only by her seizure disorder and mild hemiparesis.

Gangliogliomas are true mixed tumours containing both neuronal (ganglion cell) and glial elements. They are often silent but if they become symptomatic it is usually in late childhood or early adult life. Like the first case, case 3 had clinical and EEG evidence of focal hemispheric dysfunction as an infant but remained otherwise unaffected and undiagnosed until over a decade later when CT became available.

These cases illustrate the difficulties and delay in tumour diagnosis prior to CT and more recently MRI. These now enable earlier and more precise diagnosis and may facilitate tissue diagnosis through stereotactic biopsy techniques. We recommend that children who have either persistent focal seizures, a change in seizure pattern, loss of seizure control by medication, an acquired neurological deficit or focal slow wave activity on their EEG should be considered for a cranial CT or MRI.

The treatment of these tumours is surgical and although the tumours were incompletely excised (14–19 years after presentation), each patient is alive and well after a prolonged period of follow-up. This reflects the benign histological and biological nature of

these tumours. The subependymoma is considered to be hamartomatous by some authors while ganglioglioma and benign capillary haemangioblastoma are true neoplasms which display very benign biological behaviour.

In contrast to the clinical manifestations of brain tumours, which usually reflect tumour location rather than histology, the prognosis of supratentorial tumours seems to be determined more by histological characteristics and biological behaviour of the tumours than by their location.

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