

Acute onset of headache in an adolescent

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PART A

A 16-year-old male was referred to out hospital following a three-day history of acute onset of headache. A brain computed tomography (CT) was performed at an outside institution (Figs. 1-3). His physical examination was unremarkable, including neurological

assessment. There was no history of trauma or coagulation syndrome.

Further workup with magnetic resonance imaging (MRI) (Figs. 4-6) was performed two days after the initial CT scan.

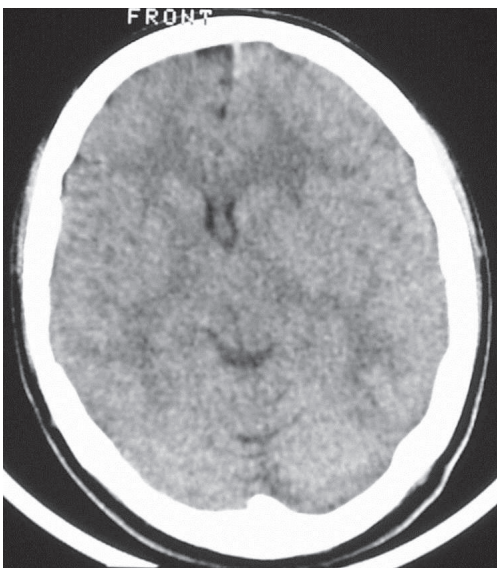


Fig. 1: Brain CT Scan without intravenous contrast administration.

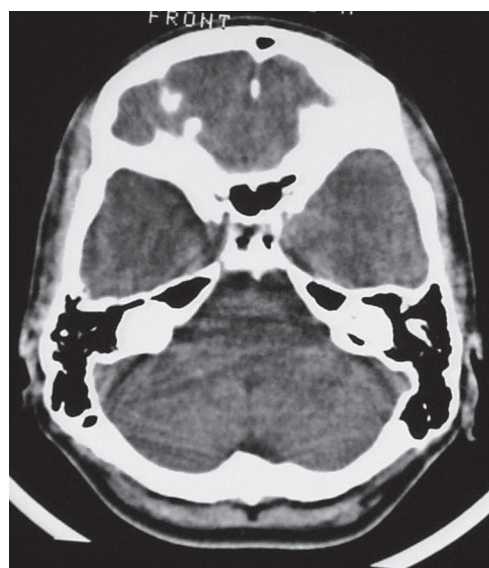


Fig. 2: Brain CT Scan without intravenous contrast administration.



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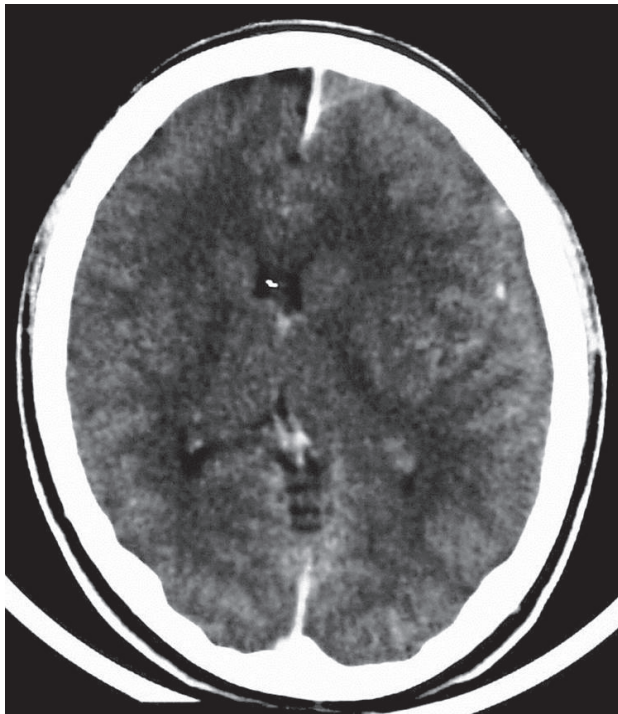


Fig. 3: Brain CT Scan after IV contrast.

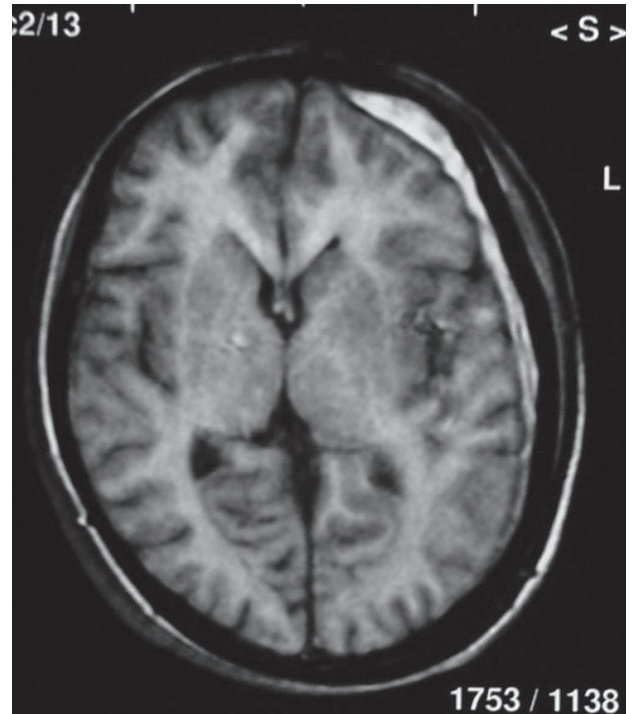


Fig. 4: MRI T1-weighted image in the axial plane.

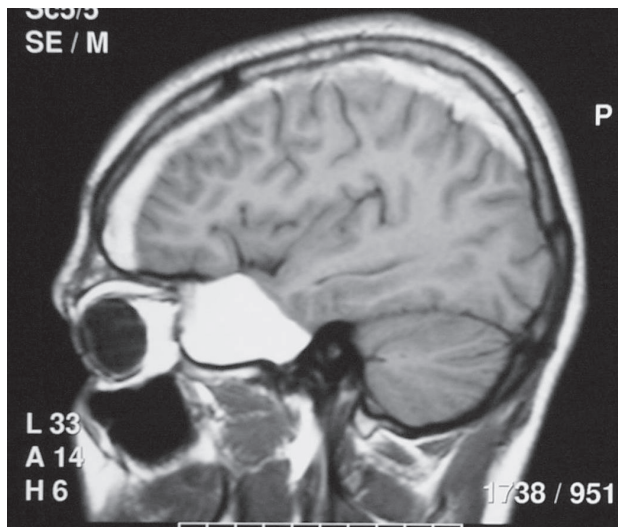


Fig. 5: MRI T1-weighted image in the sagittal plane.

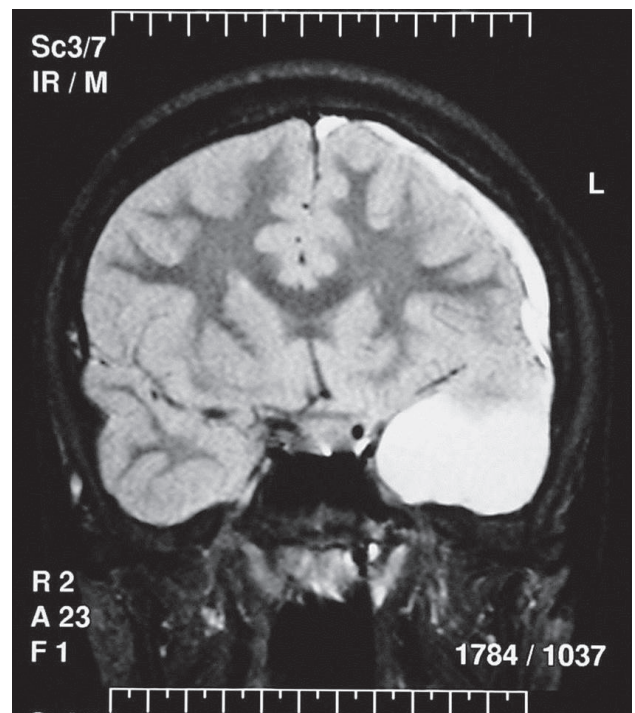


Fig. 6: MRI FLAIR sequence in the coronal plane.

PART B

Diagnosis: Spontaneous haemorrhage of an arachnoid cyst with concomitant ipsilateral subdural haematoma.

As illustrated in **Fig. 1**, a left fronto-temporo-parietal subdural haematoma is demonstrated, approximately 7 mm in thickness with supratentorial midline shift to the right of approximately 10 mm. **Fig. 2** is unremarkable. The haematoma is more conspicuous following contrast administration with no other abnormal findings (**Fig. 3**).

The left fronto-temporo-parietal subdural haematoma appears hyperintense on T1WI and FLAIR sequences, confirming its subacute nature (**Figs. 4-6**). Concurrent with the subdural haematoma, a well circumscribed hyperintense lesion is illustrated in the left middle cranial fossa, implying the cause of haemorrhage, which was later confirmed on follow-up CT scan.

The patient was treated conservatively and was discharged from the hospital with no neurological sequelae.

A follow-up CT scan was performed 18 days after the initial scan, confirming the presence of an arachnoid cyst in the middle cranial fossa (**Figs. 7, 8**). The cyst was not demonstrated on the initial scan due to iso- to slightly hyperintense contents of subacute haemorrhage and presence of streak artefacts (**Fig. 2**). Initial diagnosis was impaired due to intracystic haemorrhage. Intravenous contrast media was administered during the initial CT scan in order to explore the presence of vascular malformations [1].

Arachnoid cysts are benign, extra-axial cerebrospinal fluid collections within layers of the arachnoid that comprise 1% of the lesions occupying the intracranial space [2]. They are usually -but not exclusively [3]- congenital in nature and constitute a serendipitous finding, most commonly encountered in the middle cranial fossa [4]. Other common supratentorial locations for arachnoid cysts include parasellar cisterns, as well as the subarachnoid space over the convexities, whereas infratentorially, they may occur in

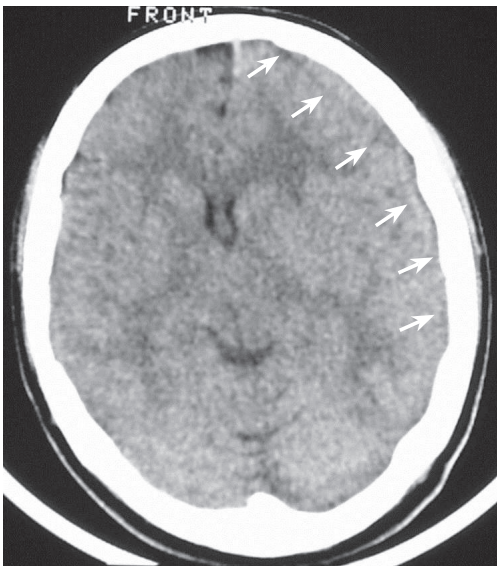


Fig. 1: Brain CT Scan without intravenous contrast administration. A left fronto-temporo-parietal subdural haematoma is demonstrated (arrows), with supratentorial midline shift to the right.



Fig. 2: Brain CT Scan without intravenous contrast administration. It is unremarkable (questionable hypodense appearance of the right temporal lobe might be due to artefacts).



KEY WORDS

arachnoid cyst; subdural haematoma; spontaneous haemorrhage; computed tomography; magnetic resonance imaging

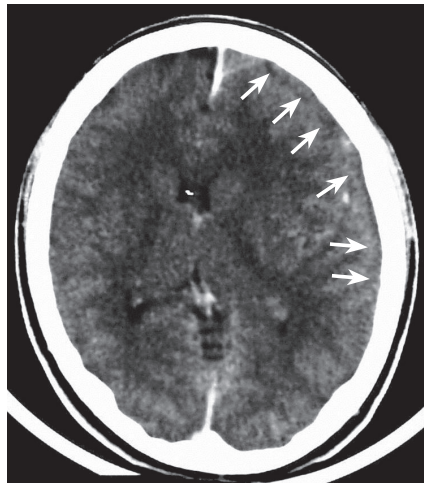


Fig. 3: Brain CT Scan after IV contrast. The haematoma is more conspicuous (arrows).

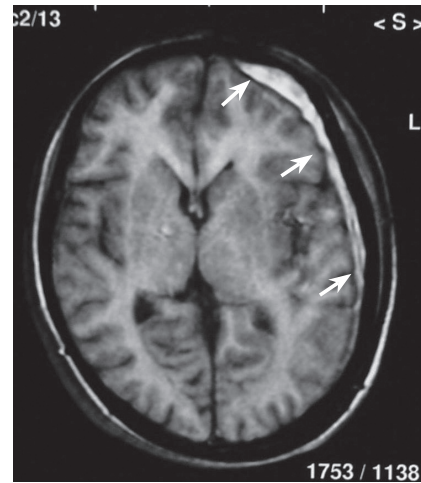


Fig. 4: MRI T1-weighted image in the axial plane. The haematoma appears hyperintense (arrows).

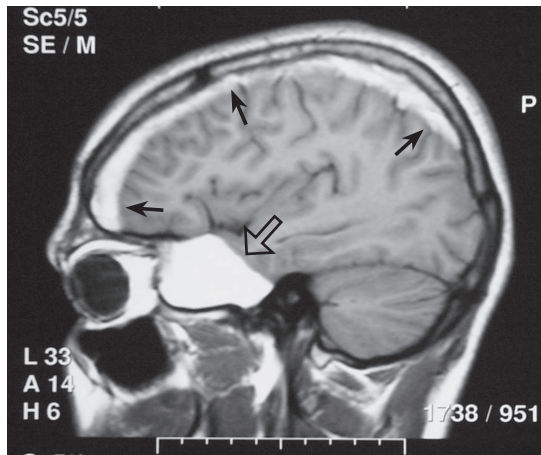


Fig. 5: MRI T1-weighted image in the sagittal plane. The haematoma appears hyperintense (arrows). A hyperintense lesion is illustrated in the left middle cranial fossa (open arrow).

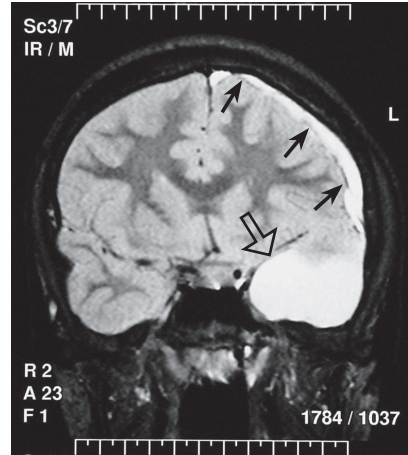


Fig. 6: MRI FLAIR sequence in the coronal plane. The haematoma appears hyperintense (arrows). A hyperintense lesion is illustrated in the left middle cranial fossa (open arrow).

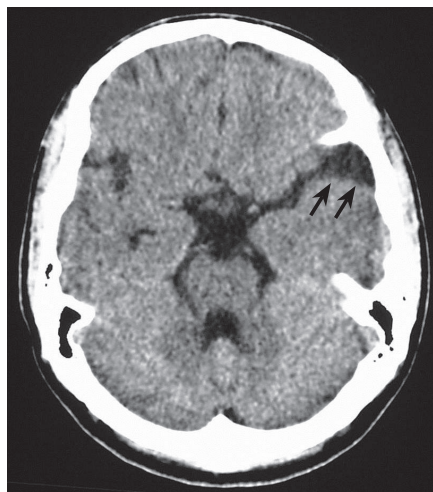


Fig. 7: Follow-up CT section shows well circumscribed hypodense lesion in the left middle cranial fossa (arrows).

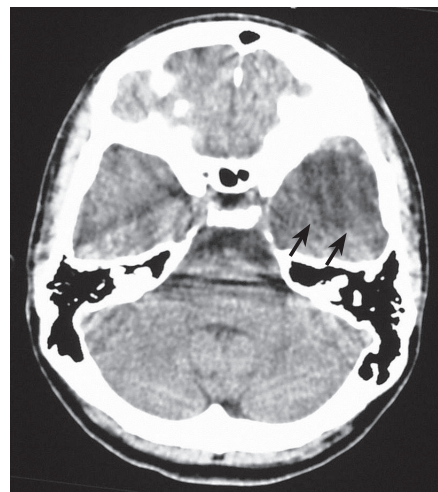


Fig. 8: Follow-up CT section shows well circumscribed hypodense lesion in the left middle cranial fossa (arrows).

the retrocerebellar cisterns, the cerebellopontine angle cisterns, and the quadrigeminal plate cistern. Intraventricular cysts are rare with a predilection for lateral and third ventricles. Arachnoid cysts should always be distinguished from subdural hygromas, dilation of normal subarachnoid space and epidermoid cysts - mostly by means of multi-modality imaging.

Although essentially clinically silent, arachnoid cysts may become symptomatic - especially in paediatric patients [4] - due to haemorrhage or growth resulting in mass effect [1, 4], presenting with signs of increased intracranial pressure. Most common complications referred in literature include subdural effusion, subdural haematoma, intracerebral or intracystic haemorrhage [2, 5, 6].

The treatment for indolent arachnoid cysts remains controversial; nevertheless, an interventional procedure is indicated in the setting of a symptomatic arachnoid cyst, presenting with raised intracranial pressure - especially in paediatric patients [4] (i.e. headache, vomiting

[6]). Cystoperitoneal shunting, microsurgical fenestration and neuroendoscopic fenestration have been proposed as effective procedures for middle cranial fossa arachnoid cysts [4]. In the case of a complicated cyst, an emergency surgical evacuation through burr holes is performed in order to decompress the subdural effusion [6], whereas in less severe cases a conservative approach may be indicated [2].

Although the scope of this case report is to accentuate a rare cause of an atraumatic subdural haematoma, other aetiologies - besides an arachnoid cyst - should be taken into consideration. Spontaneous subdural haematomas have been reported in patients with haemorrhagic disorders, pre-eclampsia and infection. Other causes may include, but not limited to, Valsalva maneuver, exercise or even dehydration [1]. **R**

Conflict of interest

The authors declared no conflicts of interest.

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