those of subarachnoid haemorrhage demonstrate that, although a history of smoking, vomiting at onset and a raised blood pressure at presentation, favour a diagnosis of subarachnoid haemorrhage, there is considerable overlap between the two conditions. Furthermore, factors known to precipitate benign headaches, such as exertion and sexual activity, may also precipitate subarachnoid haemorrhage. Therefore reliable clinical differentiation between the two conditions is not possible and in all cases of sudden onset unusual headache it is important that lumbar puncture and CT are performed; if these are normal the patient can then be reassured, and angiography is not routinely necessary.

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Differential diagnosis of spontaneous and traumatic intracranial haemorrhage

The introduction of computed tomography (CT) revolutionised the diagnosis of head injury as intracranial haemorrhages and lesions of the brain can be directly visualised. The cause of lesions shown by CT, however, can be difficult to interpret especially if information on the circumstances of the accident is missing and if the patient has retrograde amnesia. We report two patients in whom lack of information resulted in considerable diagnostic difficulties.

The first patient, a woman aged 21 years, fell off her horse and was unconscious for a few minutes. She stated that the horse had shied and she had been unable to stay in the saddle. She did not have retrograde amnesia. At the time of the examination she had a visible and palpable haematoma on the back of her head with multiple scrapes. There were no focal neurological signs. The CT scan showed a haemorrhage in the right parietal region. Nine days later, a scan showed an inhomogenous structure with possible calcification (figure 1). The MRI showed a cavernous angiomata in the right parietal region.

The second patient, a woman aged 51 years, suffered an accident while riding in a car on the autobahn. A tyre broke loose on a truck driving in the opposite direction and rolled into the car in which she was riding. She lost consciousness immediately and was subsequently intubated by a doctor in the emergency ambulance. At the time of admission she had a considerable scalp injury and a haematoma around the left eye. She localised to pain stimulation and did not show any focal neurological signs. Radiographs showed a left orbital roof fracture, a compression fracture of the third thoracic vertebra, and a ventral separation of the massa lateralis of the second cervical vertebra. In addition to the left orbital roof fracture, a CT scan showed extensive subarachnoid haemorrhage in the basal cisterns (figure 2), the interhemispheric cistern, and cortical subarachnoid space with intraventricular haemorrhage in the third and fourth ventricles. After intensive treatment she showed considerable improvement and was extubated after six days and slowly mobilised. Two weeks later the orbital fracture was closed surgically. A few hours later there was increasing loss of consciousness and headaches. The CT scan showed a new, fresh subarachnoid haemorrhage with ventricular haemorrhage. Angiography showed a pea-sized aneurysm of the supraclinoid part of the right internal carotid artery.

The differentiation between a spontaneous and a traumatic intracranial haemorrhage has important consequences. A spontaneous intracranial haematoma of atypical localisation or a spontaneous subarachnoid haemorrhage require angiography to exclude or confirm a vascular lesion. Due to the great risk of recurrent haemorrhages early surgery or subarachnoid haemorrhage does not require any surgical or other treatment. Difficulties arise in two main circumstances: either the patient suffers an accident for unknown reasons and the CT scan shows changes which are unusual for injury (patient 1), or the exact circumstances of the accident are known and apparently confirm injury but the CT scan shows another source for the intracranial haemorrhage (patient 2). Only the neuroradiological findings (patient 1) or the clinical progress (patient 2) led to a correct diagnosis of the vascular malformation. The injury must have led to haemorrhage from the cavernous angioma and the supracholinoid aneurysm. In addition to failure to detect some consequences of injury or detection only after a time delay, the CT findings may lead to a misdiagnosis. The accident may result in a rupture of a vascular malformation or spontaneous haemorrhage may cause the accident. In such cases knowledge of the circumstances of the accident and careful analysis of the neuroradiological findings may lead to a correct diagnosis.
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