



LECTURE

Neuroimaging in acute haemorrhagic stroke

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Abstract

There are two types of stroke, haemorrhagic and ischaemic. Haemorrhagic events are far less common; in fact studies indicate that only 8–18% of strokes are haemorrhagic [1–2]. However, haemorrhagic stroke is associated with higher mortality rates [3], being responsible for about 40 percent of all stroke deaths.

Haemorrhagic stroke is an acute event that follows a haemorrhage in the intra-axial space. Its neurologic effects may be associated with mass effect per se (creating swelling and pressure), but additionally the resulting haematoma triggers a series of adverse events causing secondary inflammatory insults [4]. The haemorrhage might be intracerebral (ICH) or in the subarachnoid space. Subdural and epidural hematomas are commonly associated with trauma and with a different clinical spectrum, and, therefore, are not included in this discussion.

ICH is subdivided according to its primary (80% to 85%) or secondary (15% to 20%) causes. Primary causes may be hypertension or cerebral amyloid angiopathy. The causes of secondary ICH include vascular malformations (aneurysms, arteriovenous malformations, cavernoma, dural arteriovenous fistula), tumours, venous thrombosis, haemorrhagic transformation of ischaemic strokes, vasculitis, coagulopathies, and trauma [1].

Patients with haemorrhagic stroke may present with acute focal neurologic deficits like those of ischaemic stroke.

Therefore, brain imaging is a crucial step in the evaluation of suspected haemorrhagic stroke and these patients should be quickly and accurately identified. Due to its wide availability and acquisition speed, CT scan is the imaging modality of choice to assess patients with suspected intracranial haemorrhage. Acute extravasated blood, in a patient with a normal haematocrit, will be visible as increased density (hyperdensity, hyperattenuation) on non-enhanced CT scans of the brain. We aim to review imaging patterns and provide some tips to help the clinician recognize intracerebral haemorrhage, and other further underlying aspects that may be helpful in the diagnostic workup of the patient.

References:

1. Feigin, Valery L et al. Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century. *The Lancet Neurology*. 2003; 2:1, 43–53.
2. Steiner T et al. European Research Network on Intracerebral Haemorrhage. European research priorities for intracerebral haemorrhage. *Cerebrovasc Dis*. 2011;32:409–419.
3. Joseph Broderick et al. Guidelines for the Management of Spontaneous Intracerebral Haemorrhage in Adults 2007 Update: A Guideline From the American Heart Association/American Stroke Association Stroke Council. *Circulation*. 2007;116:e391–e413.
4. Aronowski J, Zhao X. Molecular pathophysiology of cerebral haemorrhage secondary brain injury. *Stroke*. 2011;42:1781–1786.

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