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ENDGAMES

SPOT DIAGNOSIS

Computed tomography findings in a confused patient

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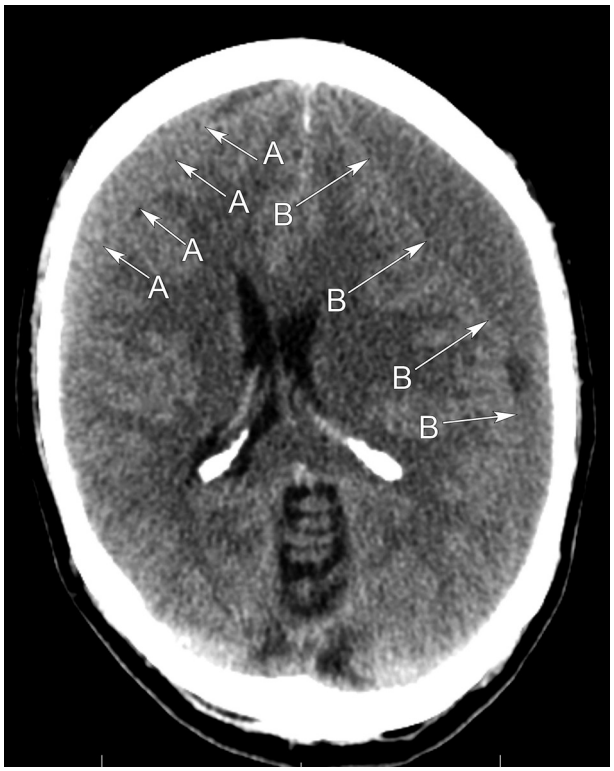
A 75 year old woman was referred to the emergency department from her nursing home because of increasing confusion. She had a history of falls and was taking warfarin for atrial fibrillation (international normalised ratio 2.6). On examination the patient appeared confused but had no focal neurological deficit. She underwent cranial computed tomography (CT) (fig 1). What does this show?

Answer

The CT scan shows two subdural haematomas: one on the right (fig 2, arrows A) and a larger, older haematoma on the left (fig 2, arrows B). The image clearly shows the changing density of subdural haematomas over time.



Discussion

The subacute subdural haematoma on the right (fig 2, arrows A) contains mixed and high attenuation blood. The larger subdural haematoma on the left (fig 2, arrows B) has a hypodense appearance and therefore is older. When a clot first forms and retracts, the density (and therefore Hounesfield unit, HU) is high. This makes acute blood easy to identify on an unenhanced CT. Over time, clot lysis results in a progressive reduction in density (and thus HU). At approximately 10-14

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days the clot density becomes similar to that of brain parenchyma (isodense). At approximately one month, the density decreases so much that it becomes less than that of the brain (hypodense). In most cases, non-contrast CT will be enough to diagnose a subdural haematoma. However, diagnosis becomes more challenging when the heamatoma is isodense. Methods used by radiologists to diagnose isodense subdural haematomas include looking at the distance between the grey-white junction and the skull. This should be similar throughout the cerebral hemispheres (except for the insular cortex) and an increased distance can indicate a subdural haematoma. Radiologists might also look for other signs of mass effect, give intravenous contrast, or perform follow-up CT or magnetic resonance imaging.

In this case, signs of mass effect include sulcal effacement and midline shift to the right. The extent of midline shift in this case is, however, affected by the bilateral nature of the disease.

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