DISPLACEMENT OF ANTERIOR CEREBRAL VESSELS IN CEREBRAL DYNAMIC STUDY IN CASES OF CHRONIC SUBDURAL HEMATOMAS

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About 75–80% chronic subdural hematomas give positive results in a brain scan. The typical scintigraphic finding of chronic subdural hematoma is a diffuse widening and increase of the peripheral activity on the anterior view. In the flow studies subdural hematomas lead occasionally to peripheral activity defects. In two cases of chronic subdural hematoma without typical patterns in a perfusion study as well as in static images, we found a displacement of the anterior cerebral vessels as an indirect sign of space occupation.

In 75–80% of chronic subdural hematomas (CSH) the brain scans are positive. The diffuse widening and increase of the peripheral activity depends on development of a hematoma membrane (*1*). In some cases of CSH a rapid perfusion study demonstrated an area of decreased peripheral activity due to the subdural fluid accumulation (*1,2*). This paper reports two cases of CSH where only the displacement of the anterior cerebral vessels indicated the space-occupying lesion.

CASE REPORT

Case 1. A 62-year-old man with known hypertension was admitted to the hospital with an acute spastic hemiplegia and facial paresis of the right-hand side. Four years earlier he had had a clinical stroke syndrome with involvement of the left upper limb.

A cerebral perfusion study was performed with the scintillation camera (Pho/Gamma HP, Searle

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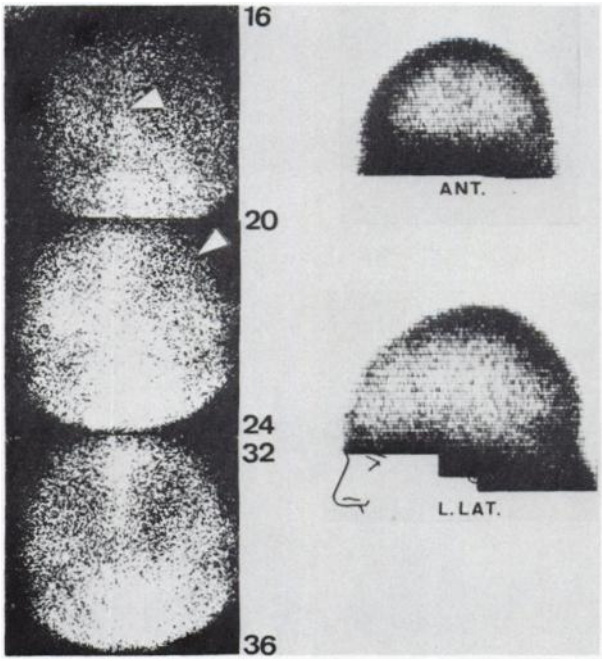
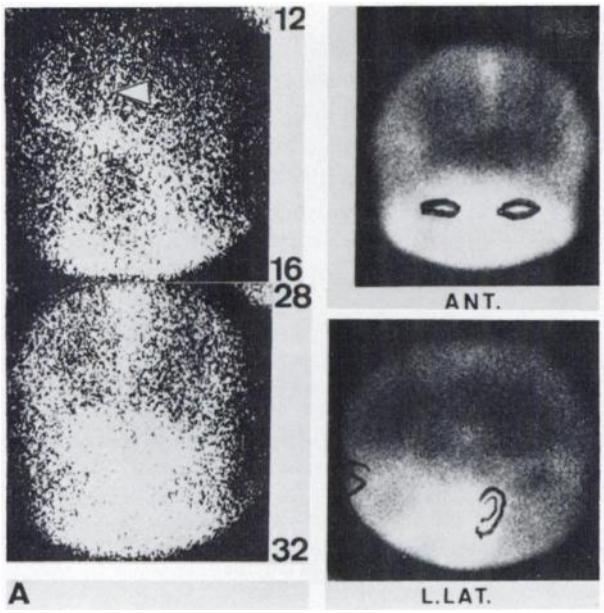


FIG. 1. Case 1. Displacement of anterior cerebral vessels in early arterial phase (first frame 16–20 sec) was not discovered. Decreased activity perfusion of left hemisphere [frame 20–24 sec (arrow)] was interpreted as cerebrovascular occlusive disease of branch of left middle cerebral artery. Static images (right) show no abnormality.



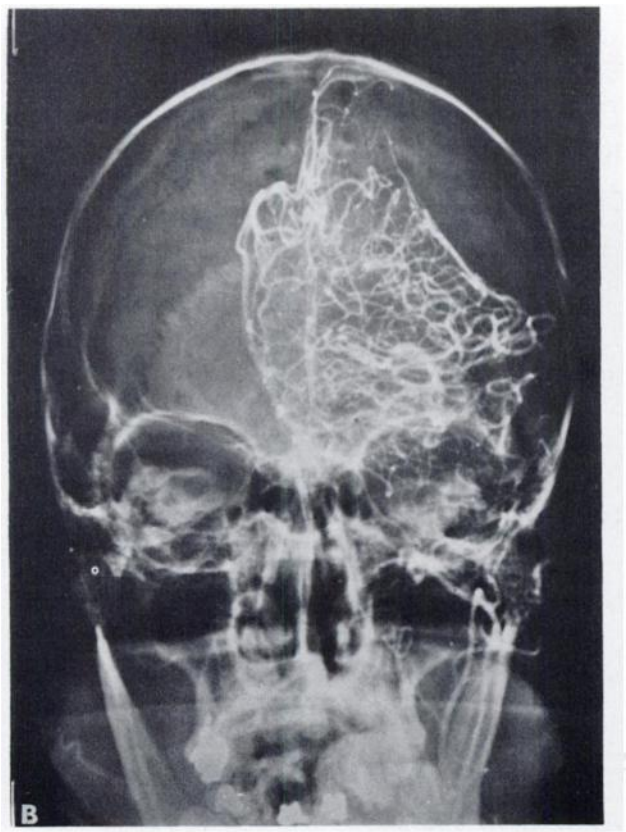


FIG. 2. (A) Case 2. Dynamic perfusion study demonstrates displacement of anterior cerebral vessels to right in early arterial phase [frame 12–16 sec (arrow)]. In venous phase (frame 28–32 sec) septum activity is in midline. Static images exposed with scintillation camera (300K counts) show faint activity accumulation over left temporal lobe probably due to technetium secretion by choroid plexus. (Patient was not prepared with perchlorate.) (B) Left carotid arteriography demonstrated large subdural hematoma in left frontoparietal area.

Radiographics) after i.v. administration of 10 mCi ^{99m}Tc-pertechnetate. The 4-sec frames show decreased activity perfusion of the left hemisphere in the arterial phase. Displacement of the anterior cerebral vessels to the right was not discovered. The brain scans were normal (Fig. 1). The result of this investigation was interpreted as a cerebrovascular occlusive disease of the branch of the left middle cerebral artery.

The patient died 11 days later with a severe pulmonary embolism. Postmortem examination revealed a chronic subdural hematoma of 200-ml volume in the left frontoparietal area. The left middle cerebral artery was not involved.

Case 2. A 57-year-old man was admitted to the hospital with assumed headaches of 4 weeks' duration and discrete paresis of the right upper limb.

A cerebral perfusion study after i.v. administration of 10 mCi ^{99m}Tc-pertechnetate revealed a displacement of the anterior cerebral vessels to the right in the early arterial phase. In the venous phase the superior sagittal sinus and the septum activity were in the middle line. The static images performed with the scintillation camera show a faint activity accumulation over the left temporal lobe, probably due to technetium secretion by the choroid plexus

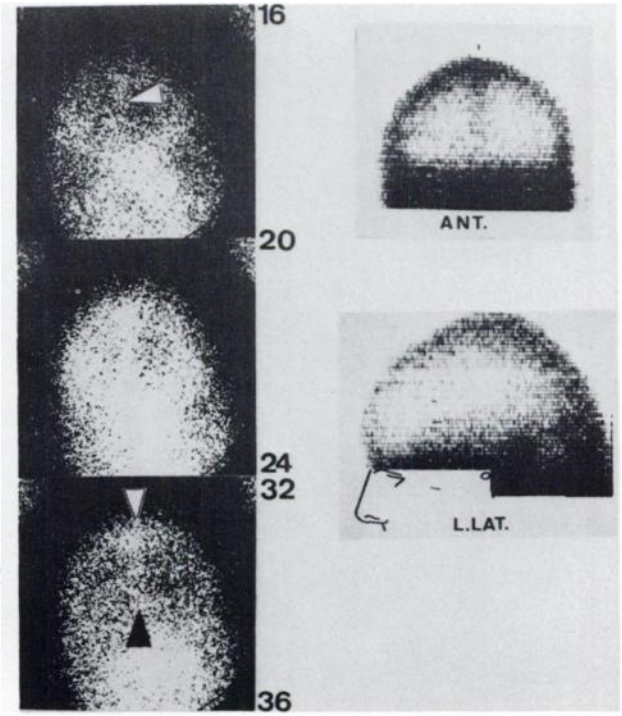


FIG. 3. A 39-year-old man with astrocytoma in left frontal lobe treated by surgery 6 years ago. Clinical findings suggested recurrence. Rapid dynamic study demonstrated displacement of anterior cerebral vessels to right [frame 16–20 sec (arrow)]; venous structures are not dislocated [frame 32–36 sec (arrows)]. Static images show no focal abnormality. At craniotomy large cyst was found in left frontal lobe but no tumor.

(Fig. 2A). The scans were interpreted as a suspected space-occupying lesion in the left frontoparietal area. An angiographic examination of the left carotid artery was performed and it showed a large subdural hematoma in the left frontoparietal area (Fig. 2B). A hematoma of over 300 ml volume was surgically evacuated.

DISCUSSION

In two patients with CSH the cerebral perfusion study shows displacement of the anterior cerebral vessels. The static brain images were normal. The typical patterns of CSH were not observed. In the first case the result of the flow study was falsely interpreted as a cerebrovascular occlusive disease of the middle cerebral artery; in the second case a space-occupying lesion was detected.

The displacement of the anterior cerebral vessels in the cerebral perfusion study is not typical for subdural hematomas. The sign indirectly indicates space occupation of one hemisphere and can be helpful by localizing of lesions not detected by scintigraphy such as astrocytomas or cysts (Fig. 3).

The displacement of the anterior cerebral vessels must be strongly distinguished from the effect of head torsion in the sagittal axis where both arterial as well as venous structures are dislocated from the midline.

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