CT quiz: an old lady with sudden onset of right-sided weakness

電腦掃描猜謎：一名右側突然無力的老年女士

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Case

A 58-year-old lady presented with sudden onset of right-sided weakness. The physical examination revealed right upper and lower limb power of grade 1/5 while the left side was grade 4/5. The Glasgow Coma Scale score was 9/15 (E2V2M5). She had a cardiovascular accident (CVA) with left hemiparesis 10 years ago but had good recovery afterwards. There was no significant deterioration in power over the left side as compared with that of the previous post-CVA recovery period. An urgent CT brain was performed in the accident and emergency department (Figures 1-3).

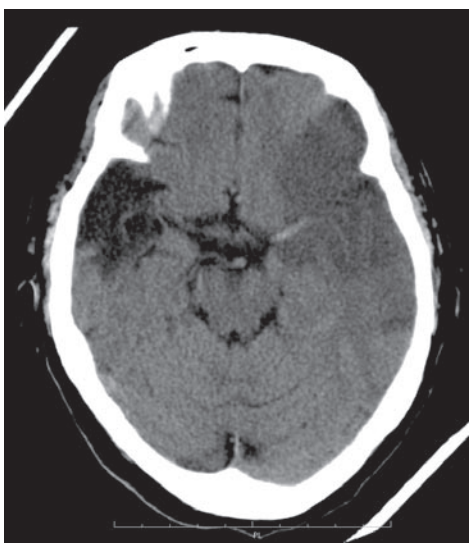

Figure 1. Non-contrast axial CT brain.

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Questions

1. What are the abnormalities?
2. What other CT findings should be looked for in this patient?
3. Which type of investigation will be helpful, in case of a normal CT scan but clinical features of acute stroke are present?

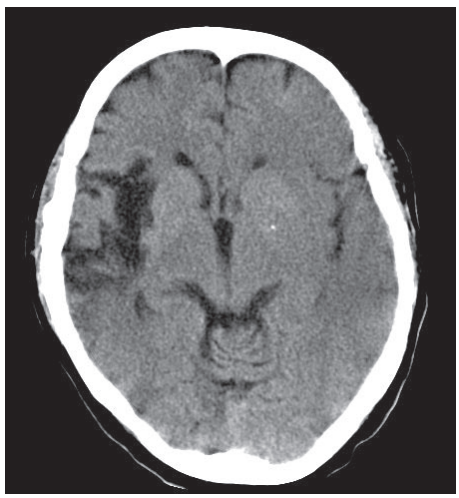

Figure 2. Non-contrast axial CT brain.

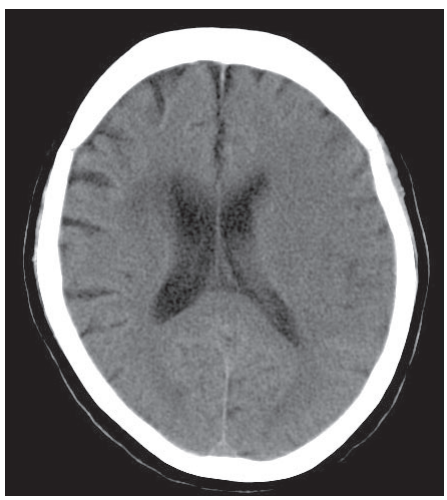

Figure 3. Non-contrast axial CT brain.

Answers

1. The non-contrast CT brain shows features of early changes of acute left middle cerebral artery infarction.
   a. Hyperdense left MCA sign (Figure 1) – suggestive of intravascular thrombi.
   b. Insular ribbon sign (Figure 2) – loss of gray-white matter definition in the lateral margins of the left insula.
   c. Sulcal effacement in the left MCA territory (Figure 3).

   A large irregularly-shaped hypodense lesion is also noted in the right temporoparietal region which is compatible with an old infarct/previous left hemiparetic stroke 10 years ago.

2. a. Haemorrhage
   b. Other early CT signs of acute MCA infarction e.g. obscuration of the lentiform nucleus – hypoattenuation of the lentiform nucleus.
   c. Mass effect – Midline shift, sulcal effacement, transtentorial herniation.

3. MRI brain (diffusion-weighted image and ADC [apparent diffusion coefficient] map) – detection of hyperacute infarct, not able to be demonstrated on plain CT scan at early presentation.

Discussion

Stroke is a leading cause of morbidity and mortality.[1] The imaging goal is to establish a diagnosis as soon as possible and to obtain accurate information for prompt medical treatment or intervention.[1,2]

Unenhanced CT scan is widely accessible in Hong Kong and can be performed quickly. It can detect acute haemorrhage (contra-indication for thrombolytic therapy), and also early features of acute infarct as illustrated in our case. Early signs for acute infarct on CT include hyperdense vessel sign, the insular ribbon sign, and obscuration of the lentiform nucleus.[1,3,4]

For our patient, subsequent CT brain performed 4 days after admission showed a large hypodense wedge-shaped area in the left MCA territory (Figure 4), consistent with an established left MCA infarct. There were also evidence of mass effects causing midline shift and obliteration of the left lateral ventricle.

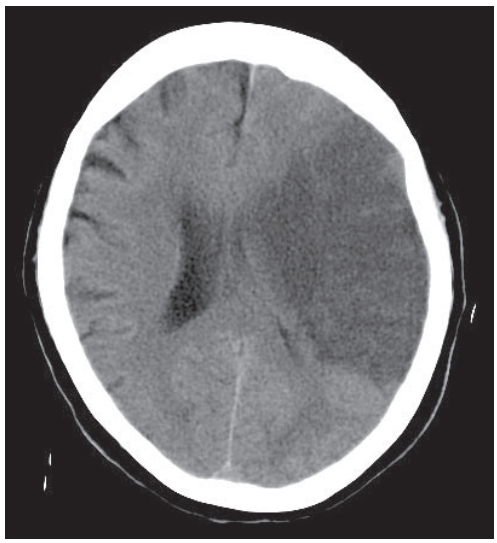

Figure 4. Non-contrast axial CT brain on Day 4.

Acute infarcts are more visible on MRI than on CT, with over 80% of MRI results positive on the 1st day as compared to 60% for CT scans.[5] In patients with clinical features of acute stroke but a normal CT scan, MRI (DWI/ADC) can help to show early changes of infarct. MR imaging is particularly superior in the detection of stroke in the posterior fossa where CT is limited due to beam-hardening artifact from the adjacent skull base.[5] Lacunar infarcts and small cortical strokes are also seen with higher conspicuity.[5]

References

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