

## CT scan quiz: a young lady with headache and confusion

電腦掃描猜謎：一名患頭痛及精神錯亂的年輕女子

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### Case

A 24-year-old Vietnamese lady presented with headache and confusion. She also suffered from chronic cough for six months. An urgent plain computed tomography (CT) scan of the brain was performed (Figures 1a & 1b).

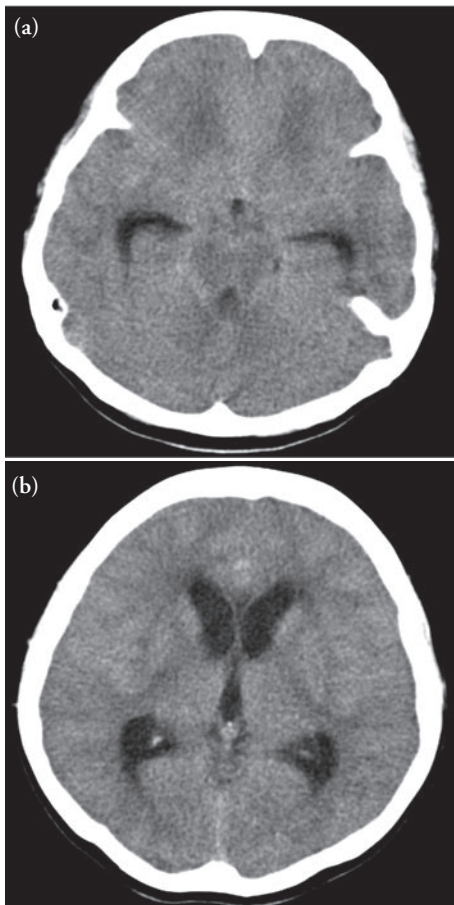


Figure 1. Non-contrast axial CT scan of brain at different levels.

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### Questions

1. What are the radiological findings?
2. What are the differential diagnoses?

A contrast CT scan of the brain was arranged afterwards (Figures 2a & 2b).

3. What additional radiological finding is seen?
4. Together with the clinical information, what is the most likely diagnosis?

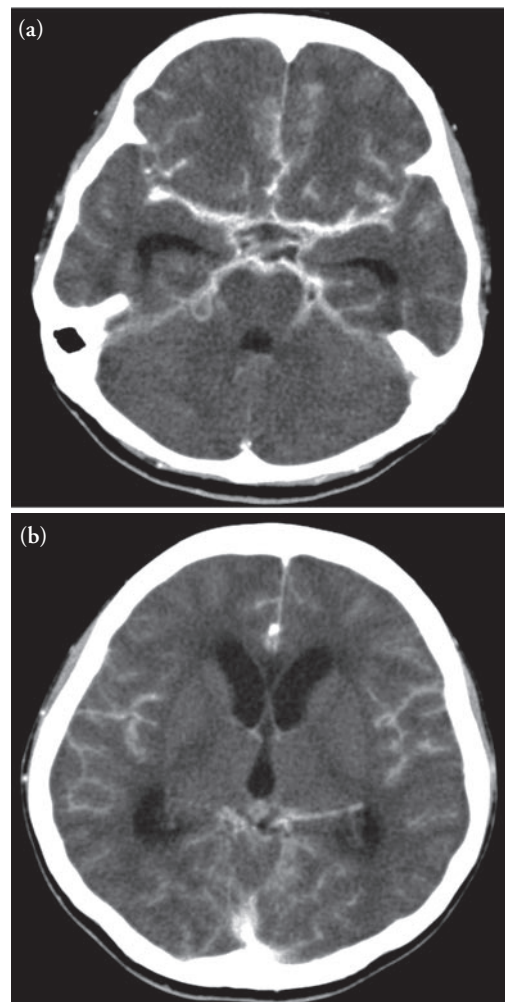


Figure 2. Post-contrast axial CT scan of brain at different levels.

## Answers

1. Obliteration of basal cisterns by isodense to slightly hyperdense material. Communicating hydrocephalus with periventricular hypodensity suggestive of transependymal spread of cerebrospinal fluid related to elevated intraventricular pressure.
2. Meningitis (e.g. tuberculosis, pyogenic, *Cryptococcus*), subacute subarachnoid haemorrhage, leptomenigeal seeding of tumour, neurosarcoidosis.
3. Diffuse intense leptomenigeal enhancement in basal cisterns, Sylvian fissures and cerebral sulci.
4. Tuberculous meningitis.

## Discussion

Tuberculous meningitis (TBM) is the commonest subacute meningitis in developing countries.<sup>1</sup> Even in developed countries, its incidence has been rising because of AIDS, organ transplantation, the use of immunosuppressive drugs and the problem of multi-drug resistant tuberculosis.<sup>1-5</sup> Central nervous system (CNS) infection with *Mycobacterium tuberculosis* can present as tuberculous meningitis, tuberculoma, tuberculous abscess, cerebritis or any combination of these.<sup>1</sup>

TBM is the most common presentation of CNS tuberculosis (TB). On non-contrast CT scan, isodense to hyperdense exudates filling the basal cisterns may be observed. After intravenous contrast administration, there is typically diffuse enhancement of the basal subarachnoid cisterns and occasionally meningeal enhancement is seen over the cerebral convexities, the Sylvian fissures and the tentorium.<sup>2-5</sup> Magnetic resonance imaging is generally considered more sensitive than CT in detecting TBM.<sup>2,3</sup>

Hydrocephalus is the most frequent complication of TBM and is generally of the communicating type secondary to blockage of cerebrospinal fluid resorption by inflammatory exudates in the basal subarachnoid

cisterns. Occasionally, the hydrocephalus is of the obstructive type, secondary to narrowing of the cerebral aqueduct.<sup>2</sup>

Cerebral infarction is another common complication of basal meningitis which adds to morbidity and mortality.<sup>1-5</sup> It is the result of inflammatory exudates involving the adventitia, progressing to affect the entire vessel wall, and leading to panarteritis with secondary arterial spasm, thrombosis and occlusion.<sup>2,3</sup> Infarcts are most commonly seen in the basal ganglia and internal capsule related to the encasement of the basal perforating arteries, particularly the origin of the lenticulostriate arteries, by the extensive basal meningeal exudates that characterize TBM.<sup>2,4</sup>

The radiological differential diagnosis of TBM includes other infectious meningitis (e.g. pyogenic, *Cryptococcus*), leptomenigeal seeding of tumour (e.g. medulloblastoma in children, breast carcinoma in adult), neurosarcoidosis, subacute subarachnoid haemorrhage.<sup>2,3,5,6</sup> The combination of meningitis and tuberculomas would be highly suggestive of CNS TB.<sup>3,4</sup>

## References

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