

Multiple intracranial arteritis and hypothyroidism secondary to *Streptococcus anginosus* infection

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Image quiz

A 50-year-old woman was brought to medical attention because of fever, toothache, headache and impaired ambulation worsening over the previous week. On examination, she had the right III, IV, VI and left V1 cranial nerve palsy and left leg monoplegia. Head MRI, enhancement, MRA and MRV were done as in the figure below. Lumbar CSF culture revealed gram positive bacteria infection. After anti-biotic treatment, She achieved remission of the headache and fever. But gradually she developed apathy, memory deterioration, disorientation and partial acalculia. Which is the most valuable to find out the cause of the patient's mental status changes?

- A. Serum folate and Vitamin B₁₂ level
- B. Adrenal cortex function (cortisol and ACTH)
- C. Thyroid function (T₃, T₄ and TSH)
- D. A second lumbar puncture
- E. Head positron emission tomography (PET)

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Explanation

Answer C is correct. *Streptococcus* is one of the most common gram positive bacteria colonizing the oral cavity. In this case, CSF culture established opportunistic infection by *Streptococcus Anginosus*.^{1,2}

Apart from causing the toothache and headache, the bacteria may spread intracranially to cause meningitis (figure c) and cerebral venous system thrombophlebitis.^{3,4} But as shown in figure e, the venous system was not obviously constricted except for thinness of the left transverse sinus, sigmoid sinus, and internal jugular vein. Stroke (figure a) is a rare complication because of inflammatory

involvement of multiple large arteries, the internal carotid artery and its branches (figure d) through the parapharyngeal space.³ In the present case, the enhancement of the pituitary stalks on MRI were also seen (figure b). The impairment of the hypothalamus-pituitary-thyroid axis could explain the mental status changes. So the thyroid function should be immediately done. In fact, serum T3, T4 and TSH were considerably decreased in this patient. After two months of the thyroxine replacement therapy, the patient's mental status returned to normal. So C is the correct answer.

Answer A. Decreased serum folate and Vitamin B12 level are more likely seen in alcoholic abuse, malformation, anemia, *et al.*

Answer B. The hypothalamus-pituitary-adrenal axis might be involved in the case but it is difficult to explain the patient's mental status changes.

Answer D. After anti-biotic treatment, the patient's headache and fever remitted and lumbar puncture may reflect the effectiveness of the treatment.

Answer E. PET may find glucose metabolism disorders in the brain but difficult to find out the cause of the patient's mental status changes.

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