The two adjacent lesions locating at frontal lobe and cerebral falx: a case report

The neurosyphilis rarely involved central nervous system, which cannot easily be diagnosed. A 37-year-old man had been suffered from repeated headache for two years, and the masses on MRI images at frontal lobe and cerebral falx were hardly illustrated. After the pathological results verify the neurosyphilis, the patient was cured by operative section and later standard penicillin treatment.

Keywords: neurosyphilis, syphilitic gumma, operation, histopathology

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Clinical details

A 37-year-old man presented with repeated headaches for one year and exacerbated in one month. With no specific location, the paroxysmal attacks were from a few minutes to several hours. After the treponema pallidum antibodies (TPPA) and the toluidine red unheated serum test (TRUST) were examined with positive and the drop of TPPA was 1:32, the patient admitted he had been affected with syphilis two years ago, but already treated by penicillin.

Radiological features

The mass at frontal lobe was hyperintense on T1-weighted imaging **(FIGURE 1A)**, little hyperintense on T2-weighted imaging **(FIGURE 1B)** and flair imaging. At same location, another extracerebral mass was enhanced on T1-weighted images after the application of contrast medium **(FIGURE 1C)**. Magnetic resonance spectrum showed the peak of NAA declined as NAA/Cho=1.40 (normal range: 2.24-3.32), NAA/Cr=1.18 (normal range: 1.79-2.61). The cerebral infarction, low-grade glioma and meningoma were all considered without a clear answer before surgery.

The two masses at frontal lobe and at cerebral falx were all sectioned by operation. The mass at frontal lobe was more whiting than normal cerebral tissue without clear boundaries and the other one at cerebral falx looked really like a meningmoa during the operation. Histologically, at frontal lobe, the blood vessels were surrounded by a lot of lymphocytes and plasma cells, accompanied with hyperplastic glial cells; at cerebral falx, the collagenic tissue was infiltrated with lymphocytes **(FIGURE 1D)**. Immunohistochemistry showed positive reaction for S-100, GFAP, CD31, CD34, Olig2, CD38, CD138, while no positive staining for epithelial membrane antigen. The Ki 67 was 10%. The histologic diagnosis of neurosyphilis was confirmed.

Discussion

The neurosyphilis is considered a rare involvement of the central nervous system, which can easily cause significant diagnostic and therapeutic challenges by mimicking other lesions, such as infarction or neoplasm [1]. Syphilitic gumma has been described as a circumscribed mass of granulation tissue that results from localized inflammation as an excessive response of the cell-mediated immune system that manifests as the invasion of lymphocytes and plasma cells [2]. Spirochetes seem to be rarely found in cerebral syphilitic gumma. The standard treatment for neurosyphilis is high dose and long-time intravenous penicillin therapy [3]. However, if without the completely accurate diagnose, the standard treatment was not easy to be implemented or insisted.

The patient admitted to be infected with syphilis and already treated by penicillin two years ago after the positive reaction of TPPA was tested. The neurosyphilis, cerebral infarction and neoplasm were all considered and not easily distinguished. If the mass was cerebral infarction, the lesion usually should present at the blood vessel supply regions; If glioma, the lesion often cause surrounding cerebral edema and was enhanced at MRI enhancement series.

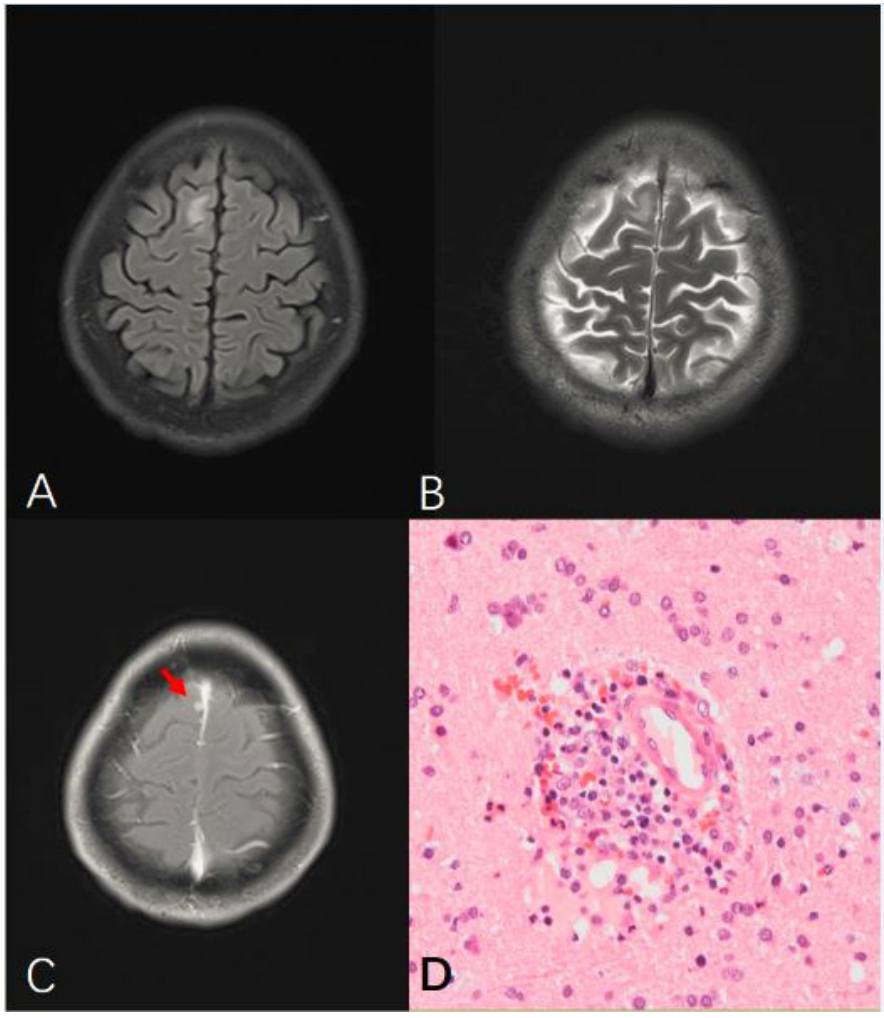

FIGURE 1.The MRI images and the Histological image. A) T1-weighted image. B) T2-weighted image. C) T1-weighted image with gadolinium enhancement. D) At frontal lobe, the blood vessels were surrounded by a lot of lymphocytes and plasma cells.

If the neurosyphilis, however, the patient had been treated by penicillin one and half year ago. Curiously, the cerebral falx "meningioma" at adjacent location accidentally was found by MRI enhancement. In order to specify the mass, the surgery may be the fastest and best way.

When the pathologic finding was confirmed, the soluble penicillin G was treated immediately by 24 million units per day intravenously for 14 days, then the benzathine penicillin G by 2.4 million units intramuscularly per week for 3 weeks. The headache disappeared completely, and the drop of TPPA was declined at 1:2 after standard treatment.

For the majority reported cases, definite diagnosis of cerebral syphilitic gumma usually occurs in or after surgery. For intracranial space-occupying lesions, unknown origin or highly suspected to be a cerebral syphilitic gumma, if there is no increased intracranial pressure, aggravated neurological dysfunction or brain hernia, attempting to use penicillin G intravenously at first and then observing the image changes seems to be the best strategy [4].

The diagnostic plans for neurosyphilis in the clinic are not unified. When the presents of the medical history, symptom, imaging findings, even the serological results were not consistent, especially after the penicillin treatment was failed, the stereotactic biopsy or operative section can be the most direct way to get answer and identify the next actionable tasks.

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