CASE REPORT

Neurosyphilitic gumma in a homosexual man with HIV infection confirmed by polymerase chain reaction

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Summary: The brain gumma is a rare manifestation of the tertiary stage of syphilis. A case of neurosyphilitic gumma was confirmed by the *Treponema pallidum* polymerase chain reaction in a 46-year-old HIV-positive homosexual man. The patient presented with a severe headache and was hospitalized. A computed tomography scan was performed which revealed a left frontal lobe mass. Lymphoma was suspected. However, infectious disease diagnostics were performed on the cerebrospinal fluid that included investigations for syphilis and other microbiological agents such as *Toxoplasma gondii.* This revealed a reactive venereal disease research laboratory test, a reactive syphilis rapid plasma reagin and a reactive *T. pallidum* particle agglutination test. The patient was treated for syphilis till complete recovery.

Keywords: infectious diseases, public health, sexual medicine, *Treponema pallidum*, brain gumma

CASE REPORT

A 46-year-old HIV-positive homosexual man was admitted to hospital with an eight-week history of worsening left frontal headaches poorly controlled by analgesics. There were no features of raised intracranial pressure. He had been HIV-positive for over 20 years and had been on a consistent antiretroviral regimen that included didanosine, abacavir and lamivudine. He took a two-month 'drug holiday' and then resumed taking his medications just prior to the onset of his symptoms. When questioned, he confirmed having new sexual partners. On admission to hospital, his neurological examination was normal, his CD4 count was 340 cells/mm^3 and a computed tomography scan showed a left frontal lobe mass (Figure 1a). The differential diagnosis included lymphoma, toxoplasmosis, a solitary metastasis and brain abscess. Antitoxoplasmosis therapy had no effect on the brain lesion.

Fifteen weeks prior to admission he had a non-specific general body eruption thought to be folliculitis, which resolved within four weeks of topical therapy. Five weeks prior to admission he had fever and night sweats that continued to admission. Three weeks prior to admission a faintly erythematous macular eruption appeared on the torso and proximal extremities, sparing the palms, soles and mucosae. This was thought to be a reaction to the analgesics.

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DISCUSSION

While in hospital, a lumbar puncture was performed. Although lymphoma was suspected, the cerebrospinal fluid (CSF) was investigated for syphilis and other microbiological agents such as *Toxoplasma gondii.* The venereal disease research laboratory test on the CSF proved to be reactive (1:8). A subsequent blood rapid plasma reagin (RPR) test was performed and was reactive at 1:1024 followed by a *T. pallidum* particle agglutination test which was also reactive. A diagnosis of syphilis was confirmed. This patient had a history of being successfully treated for syphilis 20 years earlier with reversion of his RPR test to non-reactive. His last blood for syphilis was two years before, at which time the RPR was non-reactive.

Brain biopsy showed intense lymphoproliferative infiltrates of plasma cells and T lymphocytes. B-cell infiltrates were also present. Special studies for fungal, protozoal and bacterial organisms were all negative. A paraffin-embedded tissue sample was retrieved and subjected to polymerase chain reaction (PCR) studies, which proved to be positive for *T. pallidum* (Figure 1b). A Warthin-Starry stain demonstrated the presence of spirochaetes (picture not shown).

A biopsy of the rash showed perivascular infiltration with lymphocytes, histiocytes and plasma cells consistent with but

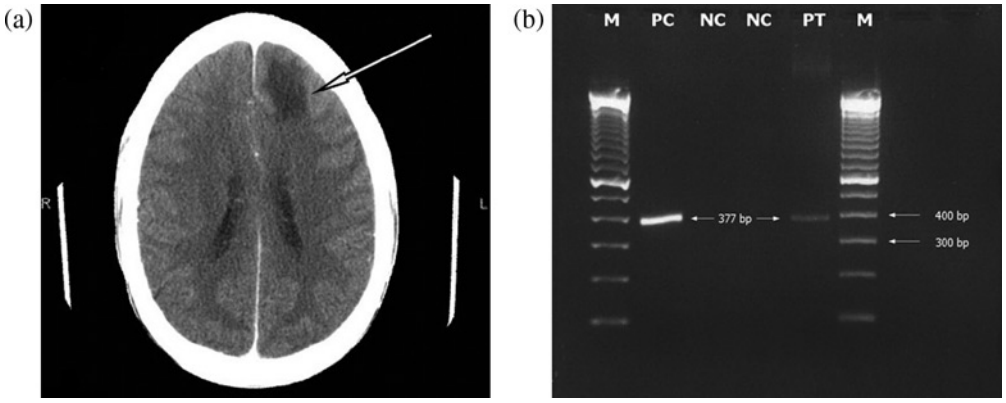

Figure 1 **(a) Computed tomography scan of the brain at admission showing left frontal mass. (b) Polymeraze chain reaction amplification *of po1A* gene fragment (377 bp) of *Treponema pallidum* from the paraffin embedded abnormal biopsy material. M-marker; PC-positive control; NC = negative control; P7 = patient**

not specific for secondary syphilis. Direct staining for spirochaetes was not done at the time because syphilis was not suspected initially. PCR was attempted on paraffin sections of the skin for *T. pallidum* but was unsuccessful in demonstrating the organism.

The patient was started on intravenous penicillin; his headaches disappeared as did his fever and rash. His RPR declined and the brain lesion resolved on subsequent neuroimaging.

Cerebral gummas, rare manifestations of neurosyphilis, were reported sporadically.[1–3] The profusion of spirochaetes in this gumma (which is unusual) was likely due to his immunosuppression. Molecular testing played a key role in confirming the diagnosis: only one other such case was found upon review.[4]

It is highly unusual for secondary and tertiary syphilis stages to overlap.

It is important to remember that syphilis is a great mimic, and that serology needs to be considered in patients who could have secondary syphilis, but in whom the cutaneous findings are not as specific as in classical cases. In addition, neurosyphilitic gumma should always be considered in the differential diagnosis of space-occupying lesions in an HIV-infected patient, particularly in high-risk individuals such as homosexual men with multiple new partners. We advocate the performance of an RPR test every three to six months to detect new syphilis, even in the absence of symptoms. PCR can be a useful adjunct to diagnosis.

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