

Probable Syphilitic Aortitis Documented by Positron Emission Tomography

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Abstract: Positron emission tomography (PET) has been used to aid in diagnosis of inflammatory and infectious disease. We describe the case of a patient with early latent syphilis with increased metabolic activity along the aorta detected via PET, suggesting probable aortitis. Three months after treatment, the PET showed apparent resolution of the aortitis.

Case Report

We report an abnormal positron emission tomographic (PET) scan in a 50-year-old man with early latent syphilis in Lima, Peru. The patient is a participant of an ongoing cohort study among at-risk men who have sex with men (MSM) in Lima.¹ As part of the study participants' quarterly clinical visit, the patient received a medical examination, counseling, and a serological test for syphilis. This patient had history of treated syphilis in April 2013, when he received 3 benzathine penicillin 2.4-MU doses, one per week. The patient was HIV infected and had been on ongoing antiretroviral therapy for 10 years. The medical examination showed that he had become resistant to antiretroviral therapy, with a viral load of 15,000 copies/mL and a CD4 T-cell count of 380 cells/mL. The patient's clinical examination showed nontender multiple lymphadenopathies in the cervical and inguinal region (2 × 2 cm). He had a rapid plasma reagin (RPR) titer of 1:256, and his *Treponema pallidum* particle agglutination result was reactive. Per study protocol, we obtained a whole-body PET scan.

The PET scan confirmed the generalized lymphadenopathy, more prominent in the bilateral inguinal regions with increased glucose metabolism and a maximum standardized uptake value of 3.6 (Fig. 1A). In addition, there was also mild asymmetrically increased metabolic activity along the ascending and the arch of the aorta which is compatible with aortitis (Fig. 2A). The patient did not have clinical or radiologic evidence of aortic disease. Based on the clinician's personal preference, the patient received three doses of benzathine penicillin 2.4-MU.

Three months later, the patient was examined again. The RPR titer declined to 1:16, and the lymphadenopathy was no longer apparent on physical examination. The repeat PET scan showed an apparent resolution of increased metabolic activity along the aorta and the inguinal lymph nodes (Figs. 1B and 2B).

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DISCUSSION

Our case report describes apparent aortitis in a recently acquired case of syphilis in a patient coinfecting with HIV. The resolution of the aortitis within 3 months of effective treatment (demonstrated by the 4-fold decline in RPR titer) suggests that the aortitis was early. In secondary syphilis, inflammation has been previously described in association with hepatitis, uveitis, meningitis, and 2 cases of aortitis.^{2,3} Aortitis, if left untreated, could result in aortic root dilation and aortic insufficiency.

Investigators recently reported an incident finding of widespread syphilitic lymphadenopathy in early syphilis by PET scan.³ Other reports have suggested that PET scans may be promising techniques for both diagnosis and follow-up of patients with syphilitic aortitis.²⁻⁴ Ours is a case of coinfection of early syphilis, HIV, and early aortitis. HIV infection has been associated with

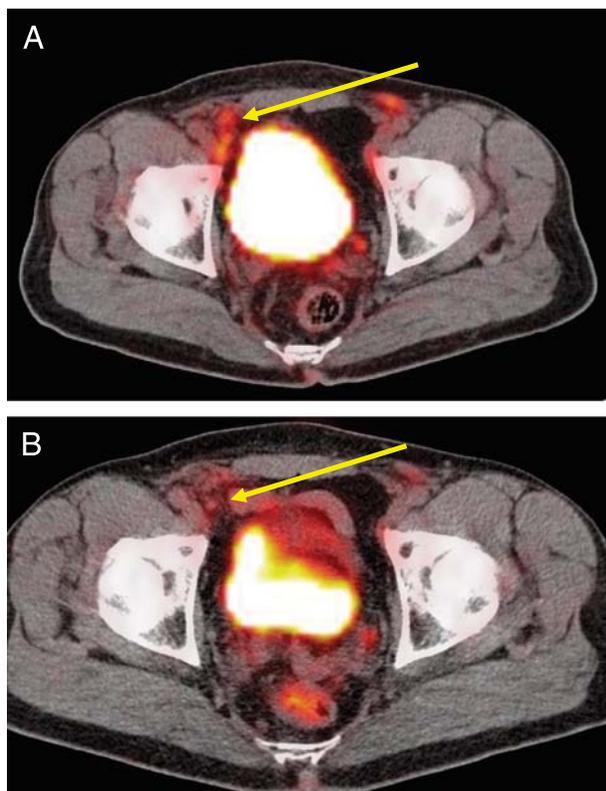


FIGURE 1. A, PET scan of 50-year-old man with early latent syphilis, coinfecting with HIV. Generalized lymphadenopathy was discovered, more prominent in the bilateral inguinal regions with increased glucose metabolism and a maximum standardized uptake value of 3.6 (RPR titer 1:256). B, Three months after treatment, the repeat PET scan showed an apparent resolution of increased metabolic activity along the aorta and the inguinal lymph nodes (RPR titer 1:16).

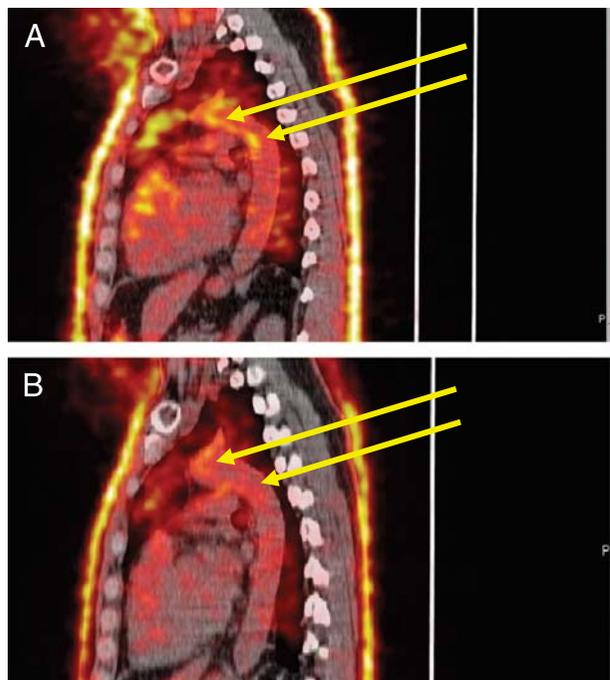


FIGURE 2. A, PET scan shows areas with metabolic uptake, consistent with active inflammation, which were found in the ascending and the arch of the aorta, indicating apparent aortitis in patient (RPR titer 1:256). B, Three months after treatment, repeat PET scan showed an apparent resolution of increased metabolic activity along the aorta (RPR titer 1:16).

increased risk of neurosyphilis⁵; however, whether HIV is associated with increased risk of syphilitic aortitis is unknown. Furthermore, lymphadenopathy is a well-known sign of syphilis and HIV

infection; in our case, the resolution of lymphadenopathy is an indicator of effective syphilis treatment.⁶

Since the introduction of penicillin, cardiovascular syphilis disease is a rare diagnosis. Aortitis of the ascending aorta is a possible life-threatening sequela of untreated syphilis. Because most patients with uncomplicated aortitis are asymptomatic, regardless of etiology, early diagnosis is difficult. Although the incidence of tertiary syphilis has declined in recent decades, early syphilis is increasing in MSM, especially in HIV-infected MSM. Increased syphilis incidence requires better control measures and innovative measures to screen and effectively monitor treatment of syphilis. Based on our case and existing literature on this subject, PET scans might be a sensitive tool to monitor inflammation associated with syphilis, particularly in research settings.

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