Secondary Syphilis with Bone Involvement of the Skull: A Case Report


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Abstract

A 40-year-old Human Immunodeficiency Virus (HIV) positive male consulted for headaches and a palpable lump on the scalp with laboratory findings relevant for increased acute phase reactants. Head CT and MR were performed, which showed temporal muscle and adjacent subcutaneous fat swelling, with underlying bone marrow edema and dural enhancement. A positive RPR test and further response to treatment for syphilis clinically confirmed secondary syphilis infection with bone and soft tissue involvement. Osseous involvement in secondary syphilis is relatively uncommon. It may be the first symptom of early-acquired syphilis and should be considered among the differential diagnoses for inflammatory lesions of the skull with overlying soft tissue swelling, especially in HIV positive patients.

Keywords: Syphilis; STD; HIV; Skull; Osteomyelitis; Periostitis

Introduction

Secondary syphilis corresponds to the hematogenous spread of *Treponema pallidum* and may present with pain secondary to osseous involvement. We report a case of a Human Immunodeficiency Virus (HIV) positive man with Computed Tomography (CT) and Magnetic Resonance (MR) imaging evidence of bone involvement of the skull and soft tissue swelling as initial presentation of early-acquired syphilis.

Case Report

A 40 year-old male with a history of HIV infection presented with a 1-month history of progressive pulsatile headache and neck pain. The patient also complained of a tender lump on the right scalp he had noticed recently. He recalled a minor head trauma 20 days earlier around the time the headaches had begun. He denied having fever, chills, joint pain or rash. The patient had been diagnosed with HIV infection 2 years earlier and was on a single tablet regimen, with good compliance and an undetectable viral load.

Physical examination revealed a 5 cm tender lump on the right temporoparietal region of the scalp with no cutaneous lesions. There was no significant cervical lymphadenopathy. Vital signs were normal, and neurological examination was unremarkable.

Laboratory tests were significant for increased erythrocyte sedimentation rate of 99 mm/h (normal <20 mm/h), and C-reactive protein of 22.4 mg/dl (normal <0.5 mg/dl). Non-contrast head CT showed subtle soft tissue swelling over the right temporoparietal region without underlying bone abnormalities (Figure 1).

Five days later, MR imaging of the brain was performed using a 1.5T system, without and with gadolinium administration. An irregular area of increased T2-weighted signal intensity and enhancement of the soft tissues on the right temporoparietal scalp were identified. Underlying structures showed signs of bone marrow edema and periostitis of the parietal bone, as well as underlying dural enhancement (Figure 2). A 5 mm soft tissue lesion in contact with the external table and periostal reaction showed restricted diffusion and was suggestive of a small abscess (Figure 3).

Further work up for infectious conditions revealed a positive quantitative Rapid Plasma Reagin (RPR) test with a titer of 1:64 and a positive *Treponema pallidum* Hemagglutination Assay (TPHA). The patient was treated initially with IM penicillin G 2400000 U, and completed further penicillin G scheme during the following weeks.

There was gradual improvement of the symptoms and the palpable lump had disappeared completely in a 6-week follow up after treatment. A new RPR test decreased to a 1:8 titer confirming a clinical response to secondary syphilis.

Discussion

Syphilis is a chronic systemic venereal disease caused by the spirochete *Treponema pallidum*, a gram-negative corkscrew shaped bacterium. Syphilis infection has three well-characterized stages with multiple presentations. Primary syphilis is characterized by a chancre at the site of inoculation and regional lymphadenopathy. Untreated hematogenous spread represents the secondary stage, which

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characteristically presents with a maculopapular rash affecting the palms and soles 2-8 weeks after the chancre appears. About one-third of patients on the secondary stage progress to a tertiary latent form of syphilis infection, as are facilitated HIV infection and transmission.

In 2000 and 2001, the national rate of reported primary and secondary syphilis cases in the United States of America was 2.1 per 100,000 populations, the lowest since 1941. However, primary and secondary syphilis infection rate has increased to 7.5 cases per 100,000 in 2015, with a recent increase of 66.7% compared to 2011 (4.5 cases per 100,000) [2].

Epidemiologic surveillance of venereal diseases in Spain reported an infection rate for primary and secondary syphilis of 7.68 cases per 100,000 in 2014. There has been an important rise in the rate of syphilis cases in Spain between 2008 and 2014, similar to the aforementioned trend [3]. In 2000 and 2001, the national rate of reported primary and secondary syphilis cases in the United States of America was 2.1 per 100,000 populations, the lowest since 1941. However, primary and secondary syphilis infection rate has increased to 7.5 cases per 100,000 in 2015, with a recent increase of 66.7% compared to 2011 (4.5 cases per 100,000) [2].

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