Arthropod Bite-Like Eruption as Rare Presentation of Secondary Syphilis in an HIV-Infected Patient

Chih-Yu Chen, Yu-Hsuan Lu¹, Yu-Chun Lin², Chih-Tsung Hung, Wei-Ming Wang, Chien-Ping Chiang

Abstract
Secondary syphilis represents a diagnostic challenge due to its varied clinical manifestations. Co-infection with human immunodeficiency virus (HIV) adds to the diversity of the clinical presentation of syphilis. We herein report a case of secondary syphilis as an arthropod bite-like eruption in a previously undiagnosed HIV-coinfected patient. A 24-year-old homosexual male presented with multiple corticosteroid-resistant insect bite-like nodules on his trunk and bilateral arms. Skin biopsy disclosed plasma cell infiltration and positive Treponema pallidum staining. His symptoms got dramatic remission after benzathine penicillin G therapy. The presented case extends the clinical spectrum of secondary syphilis in HIV patient.

Key Words: Arthropod bite, HIV, secondary syphilis

Introduction
Syphilis is a sexually transmitted disease with a triphasic natural history that significantly increases susceptibility to human immunodeficiency virus (HIV) infection.[1] Known as “the great imitator,” the clinical presentation of secondary syphilis is variable, and its morphology may be atypical in patients co-infected with HIV.[2,3] To the best of our knowledge, this is the first report of an arthropod bite-like eruption due to secondary syphilis in an HIV-infected patient.

Case History
A 24-year-old male presented with a 3-week history of numerous pruritic dull red papules and nodules on his trunk and bilateral arms [Figure 1]. No oral or genital ulcers were noted. The initial diagnosis was arthropod bite reaction. However, the eruptions were unresponsive to topical corticosteroids; therefore, a skin biopsy was conducted.

Pathology revealed acanthosis with perivascular lymphoplasmacytic infiltration from superficial to deep dermis associated with interface involvement of the skin tissue [Figure 2a and b], as well as positive staining for CD138 [Figure 2c]. Immunohistochemical studies revealed the presence of Treponema pallidum in the lower mid-part of the epidermis [Figure 2d]. The patient returned to our outpatient department and admitted homosexual behavior. Laboratory results revealed rapid plasma reagin, 1:4; T. pallidum particle agglutination, 1:1280; and anti-HIV antibodies, 153.40. The final diagnosis was secondary syphilis and HIV co-infection. He received a single dose of benzathine penicillin G (2400,000 U), with almost remission of lesions [Figure 1, lower left inset]. The patient was referred to an infectious disease specialist for HIV infection control and did not experience similar symptoms during the 1-year follow-up period.

Discussion
Syphilis is a sexually transmitted infection caused by the gram-negative bacterium, T. pallidum. It has a three-stage progression and a latent phase. Secondary syphilis occurs in approximately 25% of untreated patients, usually several weeks to a few months after the primary stage. According to the report of Centers
for Disease Control and Prevention, in 2015–2016, the national rate of primary and secondary syphilis cases in the United States was 8.7 cases per 100,000 population. Secondary syphilis typically manifests with systemic symptoms such as malaise, fatigue, fever, and headache, as well as various forms of rash, which is classically a maculopapular coppery red rash diffusely involving the trunk and extremities, including the palms and soles. As all of these secondary disease features are not highly suggestive of syphilis and may not be preceded by a detectable primary lesion, diagnosis of this stage of T. pallidum infection may be delayed for a long period and can easily be mistaken for another infectious or noninfectious systemic disease. Chancre or typical palmoplantar rashes were not initially noted in the present case. However, numerous insect bite-like nodules were seen. According to the reported literature, this was an extremely rare presentation of secondary syphilis. Serologic testing remains the mainstay for diagnosis of syphilis because T. pallidum cannot be cultured. Nontreponemal and treponemal tests are unable to detect antibodies until the infection has progressed 1–3 weeks after the development of the chancre. Direct testing methods, such as dark-field microscopic examination, direct fluorescent antibody-T. pallidum, and polymerase chain reaction, should be considered when the diagnosis of syphilis cannot be confirmed. Furthermore, skin biopsy is usually necessary to establish a diagnosis. There are some classic pathological findings in secondary syphilis, for example, the epidermis is often involved and exhibits psoriasiform hyperplasia, the dermis shows a superficial and deep chronic infiltrate, and plasma cells are present in 75% of all cases. Specific Wharthin–Starry staining (silver staining) using rabbit polyclonal antibodies can be used to identify Treponema in the tissue. A single dose of benzathine penicillin G is used to treat patients with uncomplicated syphilis. HIV-infected patients, diagnosed with syphilis, do not have unique regimens but should be treated in accordance with the same recommendations as for HIV-uninfected patients. The recommended regimen for the treatment of primary and secondary syphilis in adults is benzathine penicillin G (2.4 million units IM) in a single dose, which provides at least 14 days of circulating penicillin. Our case demonstrated a good response to a single dose of benzathine penicillin G and no cutaneous symptoms were noted during the 1-year follow-up period. The present case report extends the clinical spectrum of secondary syphilis in HIV patients and emphasizes the need for clinicians to have a heightened awareness of the varied and unusual clinical phenotypes of secondary syphilis in HIV-infected patients.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent form. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Eyer-Silva W de A, Martins CJ, da Silva GAR, Acakpovi G, Pinto JF da C. Secondary syphilis presenting as leucoderma syphiliticum: Case report and review. Rev Inst Med Trop Sao Paulo 2017;59:e74.
2. Reinehr CPH, Kalil CLPV, Reinehr VPH. Secondary syphilis: The
great imitator can’t be forgotten. Rev Assoc Med Bras (1992) 2017;63:481-83.
3. Golden MR, Marra CM, Holmes KK. Update on syphilis: Resurgence of an old problem. JAMA 2003;290:1510-4.
4. Sakthivel P, Kakkar A, Sharma SC, Panda S. Mucocutaneous Secondary Syphilis: ‘The Great Imitator’. Am J Med 2018;131:e57-8.
5. Cerchione C, Maroelo AE, Marano L, Pugliese N, Nappi D, Tosone G, et al. Secondary syphilis mimicking malignancy: A case report and review of literature. J Infect Chemother 2017;23:576-8.
6. Karp G, Schlaeffer F, Jotkowitz A, Riesenbring K. Syphilis and HIV co-infection. Eur J Intern Med 2009;20:9-13.
7. Engelkens HJ, ten Kate FJ, Vuzevski VD, van der Sluis JJ, Stolz E. Primary and secondary syphilis: A histopathological study. Int J STD AIDS 1991;2:280-4.