



Case report

A rare case of osteomyelitis and tenosynovitis in secondary syphilis

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ABSTRACT

We describe a case of secondary syphilis presenting with osteomyelitis and tenosynovitis of the thumb. With appropriate therapy, the patient's symptoms resolved and seroreversion occurred. MRI showed improvement with treatment. This case highlights the importance of early diagnosis and appropriate therapy in this unusual presentation of syphilis.

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Introduction

Syphilis is a sexually or congenitally transmitted infection caused by the spirochete *Treponema pallidum*. Bone involvement has been described frequently in congenital syphilis and tertiary syphilis, but is rarely found in secondary syphilis [1]. A high index of suspicion in patients at risk is necessary, as prompt treatment with appropriate antimicrobials alone is typically successful without requiring surgical intervention [2,3].

Case report:

A 36-year-old male with a medical history of benign hypertension, depression, and allergic rhinitis presented in January due to rash for one week. The rash started on his right forearm, spread to the right palm and later to the contralateral arm and palm. Finally, the rash spread to the bilateral soles, up the calves, and to a lesser extent the chest and back. With the rash, the patient noticed general malaise. The night prior to presentation, he developed a subjective fever, sore throat, and a dry cough, so he went to the acute care clinic where he was found to have significant transaminitis. He was referred to the emergency department for further evaluation.

Social history was significant for contact with two male sexual partners two months prior to presentation, with whom he participated in receptive anal intercourse without barrier protection. The patient later noticed rectal irritation, but was never examined and did not notice any ulcers or other lesions aside from known hemorrhoids with some occasional blood streaking

after defecation. He had been taking tenofovir disoproxil fumarate plus emtricitabine for pre-exposure human immunodeficiency virus prophylaxis for approximately 18 months and reported good compliance.

At the emergency department, the patient denied nausea, vomiting, or abdominal pain. He denied pruritis, but reported ongoing rectal pain for two months without discharge or lesions. The patient also mentioned a dull pain at the base of the right thumb which began three weeks prior to development of the rash. This pain was worsened with frequent use of the thumb, as with writing or using his cellular phone, and with range of motion at the metacarpophalangeal joint.

On examination, his temperature was 36.1°C, pulse 120 beats per minute, blood pressure 144/101 mm of mercury, and respiratory rate was 18 breaths per minute. Heart sounds were normal, lungs were clear, and he was neurologically intact. Bilateral left greater than right tonsillar exudates were noted. There was no appreciable adenopathy. There was moderate right upper quadrant abdominal pain to palpation with a negative Murphy's sign. Rectal examination revealed no significant discharge, lesions, or anal tears. There was no penile discharge or genital ulcer noted. Integumentary examination revealed a diffuse, hyperpigmented, macular rash most prominent on the upper extremities and involving the bilateral palms, but also present on the lower extremities and soles with scattered and more faint lesions on the trunk. The right thumb was slightly swollen compared to the left, with no erythema or warmth. Mild pain was elicited with movement at the metacarpophalangeal joint.

Laboratory evaluation showed a white blood cell count of 9300/ μ L with a normal differential, hemoglobin of 14.3 g/dL, platelets 471,000/ μ L, electrolytes were within normal limits, serum creatinine 0.96 mg/dL, alanine aminotransferase

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748 units/L, aspartate transaminase 319 units/L, total bilirubin 2.23 mg/dL, and alkaline phosphatase 1409 units/L. Blood cultures were negative. Human immunodeficiency virus was not detected. Fourth generation human immunodeficiency virus combination antigen/antibody screen was negative as were acute hepatitis serologies and urine, pharyngeal, and rectal gonorrhea and chlamydia nucleic acid amplification testing. *Treponema pallidum* particle agglutination assay was positive, and confirmatory rapid plasma reagin was positive with a titer of 1:16.

X-ray of the right hand revealed an aggressive-appearing lucency within the distal proximal phalanx of the right thumb concerning for osteomyelitis or malignancy. Subsequently, an MRI of the right hand showed focal cortical destruction along the radial aspect of the proximal right thumb phalanx with extensive edema and enhancement with the bone and adjacent soft tissues without fluid collection (Fig. 1). There was also extensive tenosynovitis along the flexor tendon sheath of the thumb. His C-reactive protein was found to be elevated at 2.18 mg/dL (normal range < 0.5 mg/dL).

A diagnosis of secondary syphilis complicated by syphilitic rash, hepatitis, and osteomyelitis plus tenosynovitis of the right thumb was made. The patient was treated with a weekly intramuscular injection of 2.4 million units benzathine penicillin G for a four-week course. At one month follow up, the rash was nearly resolved and his thumb pain was moderately improved. Liver enzymes continued to downtrend and almost normalized, with alanine aminotransferase 57 units/L and aspartate transaminase 38 units/L. Rapid plasma reagin was improved with a titer of 1:4.

At four month follow up, the rash had resolved, liver enzymes normalized, and the right thumb continued to improve. There was minimal residual swelling and pain, but he was able to use the thumb without functional limitations. Rapid plasma reagin improved with a titer of 1:2. Follow up MRI of the right thumb four months after completion of penicillin therapy revealed interval improvement in the proximal first phalanx osteomyelitis, with resolution of flexor pollicis longus tenosynovitis (Fig. 1). Rapid plasma reagin was non-reactive and symptoms were completely resolved at nine month follow up.

Discussion

Bone involvement is well described in both congenitally transmitted and tertiary sexually-transmitted syphilis, but is

uncommon in secondary syphilis [1]. Syphilis acquired via sexual transmission progresses through several stages. Early infection consists of primary, secondary, and early latent phases. Late infection consists of late latent and tertiary phases. After primary infection, typically resulting in a localized chancre, spirochetemia occurs quickly and organisms may invade nearly any organ system [4]. *T. pallidum* has a high affinity for bone, and bacteria are deposited into the bony periosteum, with inflammation extending into the Haversian canals and medulla [2,5]. Bone changes can develop as early as four weeks after primary chancre, and may appear as periostitis, destructive lesions, or a combination of both [6,7]. Tenosynovitis may occur alone or in combination with bony lesions, as in this case, and is most often present in the hands, knees, and ankles [8]. There is typically tendon sheath effusion without erythema or warmth [9].

Early studies reported incidence of bone involvement in secondary syphilis to be 0.15 % - 0.2 %. With improvement in imaging techniques and equipment, and the knowledge that lesions may be asymptomatic, it is now thought that that actual incidence is higher than previously reported [1]. Thus, if syphilis is suspected or confirmed in the setting of appropriate symptoms, further evaluation with imaging should be strongly considered. Bone lesions should not be ignored in this setting as advanced destruction can occur without appropriate therapy [2].

If symptoms are present, they consist primarily of bone pain, which may be relieved by movement, and worsened at night or with exposure to heat or pressure [1,9]. Headaches can occur if the skull is involved [10]. In addition, patients commonly present with other signs and symptoms of secondary syphilis. Skeletal lesions are frequently multifocal, occurring in up to 73 % of reported cases. The long bones of the limbs are most often affected, particularly the tibia, followed by the skull, ribs, and clavicle. Involvement of the spine and sternum occurs uncommonly [1,7]. To our knowledge, this is the first case reported to involve the hand.

Diagnosis may be difficult and, in some cases, requires a high index of suspicion. Patients may present with vague, mild, or no symptoms. Early bone infection also may not be visible on plain film. CT, MRI, or bone scintigraphy can be used to better identify bone changes [1,6,7]. These lesions with their moth-eaten appearance may be confused for malignancy or other infection, such as tuberculosis [11]. Treponemal and nontreponemal testing should be done and monitored as per usual recommendations for the diagnosis of syphilis. Biopsy is not usually

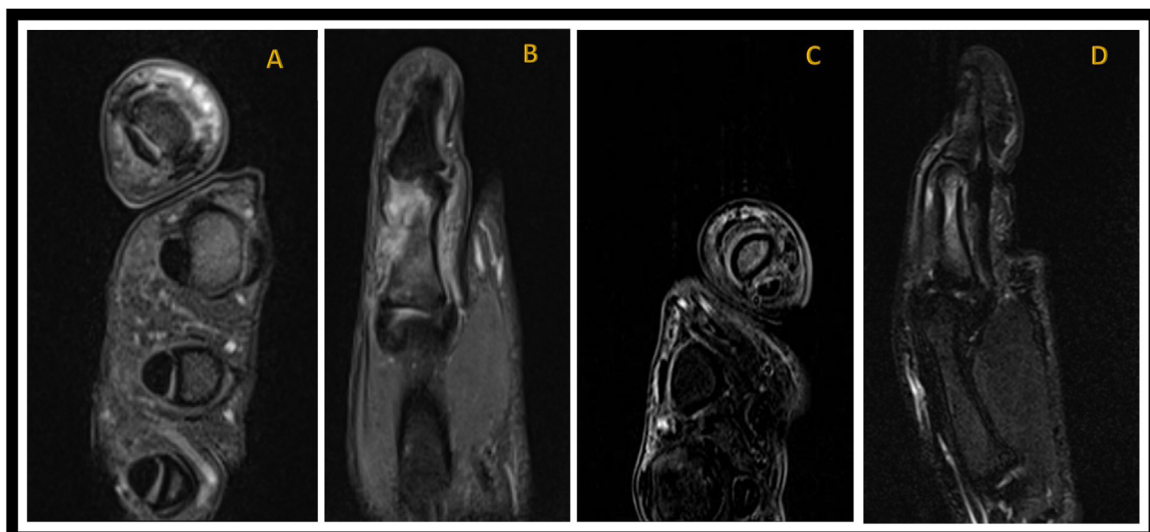


Fig. 1. MRI of the right thumb showing osteomyelitis and tenosynovitis before treatment (A, B) and improvement four months after therapy (C, D).

required in the appropriate clinical setting, however if done, histopathology usually reveals lymphocyte and plasma cell infiltration into bone and surrounding tissue [4]. Spirochetes are not easily identified from biopsy specimens [1].

There is limited data on recommended therapy for secondary syphilis with bone involvement. Based on previous literature, nearly all patients respond well to penicillin therapy and do not require surgical intervention [5,6]. There has been one case requiring total hip arthroplasty due to advanced femoral destruction in the setting of secondary syphilis [2]. Appropriate duration of antibacterial therapy is unclear, but most have treated for at least several weeks with either intramuscular benzathine penicillin G alone or following intravenous penicillin. Bone pain usually responds quickly to treatment, though significant improvement on imaging may take weeks to months [1].

Prompt recognition and antibiotic treatment of syphilis is imperative given its potential for long-term morbidity and high infectivity. This is especially important given rates of syphilis infection in the United States continue to rise [4]. Skeletal involvement in secondary syphilis is likely an underrecognized condition and may become quite destructive in a relatively short period of time. Bone infection should be considered in patients with known or suspected syphilis and suggestive symptoms. Early treatment with penicillin is typically effective and most patients do not require invasive surgical treatment.

Author statement

Taylor Nelson: Conceptualization, Writing – Original Draft, Writing – Review and Editing, Literature Review, Patient Care

William Roland: Conceptualization, Writing – Review and Editing, Literature Review, Patient Care

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request. There is no identifiable patient information in the written manuscript or the image provided.

Declaration of Competing Interest

None

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