

## **Caught by a Medieval Disease: A Monoarthritis Revealing Syphilis - A Case Report.**

### **Abstract :**

Syphilis is a sexually transmitted bacterial infection that first appeared in Spain in 1494 before spreading to several European countries such as France, Italy, Switzerland, and Germany, causing an epidemic that lasted 65 years. This disease is caused by a spirochete called *Treponema pallidum*, which was identified in 1905. It primarily manifests through skin symptoms but can also lead to vascular, neurological, ocular, and joint involvement, which can complicate the diagnosis. We report the case of a patient who initially presented with an oral ulceration, which was not identified during hospitalization and healed spontaneously, but was later complicated by monoarthritis of the left knee. Diagnosing the underlying cause was a challenge. Although the patient reported risky sexual behaviors, syphilitic arthritis was not immediately considered, partly because it is a rather rare form and also because it is a disease we are supposed to have moved past. However, it remains a relevant condition today; in fact, the WHO has reported 8 million cases of syphilis. Therefore, it is an infection that should not be ruled out.

### **Key words :**

Arthritis, Syphilis, *Treponema Pallidum*

### **Introduction :**

Syphilis is a sexually transmitted bacterial infection caused by a bacillus from the *Treponema* family, specifically *Treponema pallidum*, which was identified in 1905 by Schaudinn and Hoffmann. However, the first epidemics were described in Spain in 1494 before spreading during the Italian Wars from 1494 to 1559 to Italy, France, Switzerland, and Germany. The name of the disease comes from the poem written in 1530 by Girolamo Fracastoro, "Syphilis sive de morbo gallico," which describes the ailment suffered by the shepherd Syphilus. The incubation period varies between 10 to 90 days and can be asymptomatic, also known as latent syphilis. The most classic clinical manifestations are the syphilitic chancre, which can be oral, genital, or perineal—this is primary syphilis and corresponds to a locoregional spread of the treponeme. Secondary syphilis is characterized by a generalized papular rash, which can be roseoliform or psoriasiform. Tertiary syphilis may involve vascular, ocular, or neurological complications. Confirmation is bacteriological, achieved by identifying the treponeme in a swab sample or histologically, or through immunology, typically using three main techniques: TPHA (Treponema Pallidum Hemmagglutination Assay), VDRL (Venereal Disease Research Laboratory), and FTA (Fluorescent Treponemal Antibody), and more recently, genetic testing by PCR (Polymerase Chain Reaction) [1,2].

Syphilis can also present with atypical symptoms, such as monoarthritis, as seen in our patient.

### **Case Report:**

This case involved a 38-year-old male patient with no previous medical or surgical history, who had a history of active smoking for 12 years (12 pack-years), occasional alcohol use, and daily cannabis consumption. The patient reported having unprotected heterosexual intercourse with multiple partners, including sex workers. The onset of the illness dated back to two months prior to his admission, beginning with an oral ulceration that persisted for two weeks. The condition then evolved with the progressive onset of fleeting, migratory inflammatory arthralgias without general symptoms, which responded to analgesic treatment and non-steroidal anti-inflammatory drugs (NSAIDs). These symptoms were later complicated by clear arthritis of the left knee, accompanied by a low-grade fever of 38°C, a weight loss of 2 kg in one month, and asthenia, prompting the patient's hospitalization in the Internal Medicine Department of Ibn Rochd University Hospital in Casablanca.

On admission, the patient was conscious, with a Glasgow Coma Score of 15/15, well-oriented in time and space, normotensive, slightly tachycardic at 92 bpm, eupneic, with good ambient air oxygen saturation at 98%. The conjunctivae were of normal color. The musculoskeletal examination revealed clear monoarthritis of the left knee with the four cardinal signs present, including a positive patellar shock. The spinal examination was normal, and the rest of the clinical examination was unremarkable, with no aphthae, aphthae scars, erythema nodosum, pseudo-folliculitis, or signs of thrombosis in any of the four limbs. Ophthalmological examination only revealed astigmatism without signs of uveitis.

The initial biological workup revealed a hypochromic microcytic anemia with a hemoglobin level of 11.7 g/dl, moderate leukocytosis at 10,800/mm<sup>3</sup> with 7,200 neutrophils/mm<sup>3</sup>, a normal lymphocyte count, slight thrombocytosis at 480,000/mm<sup>3</sup>, and an elevated CRP at 88 mg/l. Given the patient's young age, male gender, and the history of oral ulceration reported but not observed during clinical examination, Behçet's disease was ruled out due to insufficient criteria, including a normal ophthalmological examination, the non-recurrent nature of the oral ulceration, the absence of genital aphthae and scars, pseudo-folliculitis, erythema nodosum, or vascular or digestive involvement, and the absence of uveitis on ophthalmological examination. Nonetheless, HLA-B51 (more common in Caucasians) and HLA-B15 (more common in Mediterranean populations) were tested and found to be negative.

We then considered an infectious origin despite the absence of an obvious entry point, suggesting a possible secondary localization. Procalcitonin testing was performed and returned negative at 0.2 ng/ml, leading us to suspect intracellular and/or atypical bacteria, viral infections, and possibly fungal infections. Given the context of tuberculosis endemicity, a QuantiFERON-TB Gold test was performed and returned negative. Given the history of unpasteurized milk consumption, brucellosis was considered, but the absence of hypersudation, diffuse pain syndrome, and lymphadenopathy was not supportive. A brucellosis serology was nonetheless performed and returned negative. Whipple's disease was also considered despite the patient's young age and the absence of digestive and cutaneous-mucosal signs; however, PCR for *Tropheryma whipplei* in blood, stool, and sweat did not detect the genome. Parvovirus B19 infection was suspected, but serology indicated a past infection (negative IgM and slightly positive IgG). HIV infection was tested for due to the history of unprotected sexual intercourse but was negative, as were hepatitis B and C serologies. Testing for other viral infections that could present similarly (e.g., HTLV-1) was not possible due to resource limitations.

An echocardiography was performed, revealing neither vegetations nor valvular abnormalities, with a good ejection fraction of 65%. A thoraco-abdomino-pelvic CT scan was conducted to search for a deep infectious focus, deep lymphadenopathy, digestive thickening, or any mass that could suggest an atypical infection or a potential neoplasia, in which case the arthritis could be a paraneoplastic manifestation, but the scan was entirely normal.

In the second line, crystalline arthritis was considered; however, uric acid levels were normal. An ultrasound revealed moderate synovitis with synovial thickening without bulging beyond the articular surfaces, along with moderate joint effusion (Grade II synovitis on grayscale), and on Doppler, several confluent hypersignals covering more than 50% of the articular surface (Grade III synovitis on Doppler). Joint aspiration yielded a slightly turbid yellowish fluid, in

which the analysis did not reveal crystals indicative of crystalline arthritis, with 60,000 WBCs predominantly lympho-plasmacytic (80% lymphocytes), and a sterile culture.

An autoimmune origin was then considered despite the absence of other supporting signs. The patient underwent an immunological workup, which included negative antinuclear antibodies (ANA) by immunofluorescence, anti-CCP antibodies, and rheumatoid factor, all of which were negative. Adult-onset Still's disease was considered due to the negative immunological workup and neutrophilic leukocytosis in the CBC, but the glycosylated ferritin level was not decreased.

It was only later that syphilitic arthritis was considered due to the history of unprotected sexual intercourse and the oral ulceration, which could correspond to a syphilitic chancre in the oral cavity (the patient reported orogenital practices). A syphilis serology was performed (TPHA and VDRL positive), but to link the arthritis to syphilis, confirmation was required in the joint effusion. A second aspiration was performed to confirm by three techniques: TPHA and VDRL, dark-field microscopy for treponema, and PCR for *Treponema pallidum* genome. TPHA was positive, but VDRL was inconclusive. Treponema was observed on dark-field microscopy, and PCR was positive.

The diagnosis of syphilis was confirmed. A lumbar puncture was performed to search for latent neurosyphilis; cerebrospinal fluid chemistry and cell count were normal, and syphilis serology (TPHA and VDRL) in CSF was negative. The patient was treated according to the protocol for secondary syphilis, consisting of an intramuscular injection of 2.4 million units of penicillin G weekly for three weeks. A low-dose oral corticosteroid therapy (0.1 mg/kg/day) was started for 15 days, followed by functional motor rehabilitation managed by the Physical Medicine Department at Ibn Rochd University Hospital in Casablanca, resulting in significant clinical improvement, including the resolution of arthritis and low-grade fever, and biological improvement with normalization of blood counts and CRP negativity.

### **Conclusion:**

Syphilis is a sexually transmitted bacterial infection caused by *Treponema pallidum*. It was a devastating disease during the Middle Ages, responsible for a European epidemic that lasted 65 years and affected Spain, France, Italy, Switzerland, and Germany. At that time, the disease was poorly understood and was treated haphazardly with bloodletting, purges, mercury, and guaiac. Effective and standardized treatment only became possible after the discovery of penicillin G by Alexander Fleming. Although often considered a disease of the Middle Ages, there has been a resurgence of syphilis in Europe and America, with the WHO estimating that 8 million adults aged 15 to 49 contracted the infection in 2022. Syphilis typically presents with cutaneous signs, but more rarely, it can cause ocular, neurological, and exclusively vascular and articular manifestations, which have been reported in recent literature and can pose

diagnostic challenges . Fortunately, the treatment remains unchanged, primarily involving penicillin G, with doxycycline as an alternative in case of allergy.

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