BRITISH JOURNAL OF HOSPITAL MEDICINE

CASE REPORT

Pulmonary involvement of secondary syphilis: the great mimicker

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Introduction

Syphilis is a sexually transmitted infection caused by *Treponema pallidum*. The number of cases of syphilis is increasing worldwide, especially in men who have sex with men; in 2019, the prevalence was 11.8% in this group (World Health Organization, 2023). An estimated 6 million new cases occur each year in people aged 15–49 years (Kojima and Klausner, 2018). Sexual history, serology and microscopy are used in the diagnosis. The early and late latent stages of syphilis are asymptomatic. Pulmonary involvement in secondary syphilis is very rare (Komeno et al, 2018; Coccia et al, 2021). Since syphilis causes diffuse lymphadenopathy, it can be confused with lymphoma. For this reason, it is known as the great mimicker.

This article discusses the case of a patient who presented with diffuse lymphadenopathy and pulmonary nodules, who was initially investigated with a prediagnosis of lymphoma.

Case report

A 23-year-old male patient presented with malaise, headache and right chest pain which increased with breathing. He had a history of corneal transplantation. Physical examination revealed lymphadenopathy in both inguinal regions. Ultrasonography showed diffuse lymph nodes with a pathological appearance in the inguinal and pariliac areas. Malignancy was then investigated.

The testicles were normal on ultrasound. Thorax computed tomography showed a 20 mm spiculated nodule in the lower lobe of the right lung (Figure 1), with a 5 mm nodule adjacent to this. Thoracic and abdominal computed tomography scans showed pathological lymph nodes in the inguinal, pariliac, presacral and pararectal areas (Figure 2). Given the possibility of malignancy positron emission tomography-computed tomography was performed and showed pathological F-18 fluorodeoxyglucose (FDG) uptake (SUVmax:21.1) in the cervical, inguinal, pariliac, presacral and pararectal lymph nodes. Excisional biopsy of the left inguinal lymph node was performed. Brain magnetic resonance imaging, performed for the patient's complaint of intense headache, showed contrast enhancement and diffusion-restricted area in the left temporal muscle (Figure 3). These findings were considered to indicate lymphoproliferative disease and bone marrow biopsy was performed for definitive diagnosis.

The patient also had skin rashes and therefore syphilis serology tests were taken. Serological rapid plasma reagin and *Treponema pallidum* haemagglutination assay results were positive (Table 1). He was tested for human immunodeficiency virus (HIV), herpes simplex virus and hepatitis markers, as these can accompany syphilis, and these were all negative. Excisional lymph node biopsy was reported as showing granulomatous lymphadenitis compatible with syphilis. Penicillin-G was started. After 3 weeks, computed tomography of the thorax showed shrinkage of the right lung's nodules. The skin rashes had decreased. After 3 months, both nodules in the lung had completely regressed and all lymph nodes had shrunk. The patient made a complete multisystemic recovery.

Discussion

Syphilis, known as the great mimicker, was first described in 1530 (Coccia et al, 2021). Pulmonary involvement in syphilis is rare and was first described in 1967, with very few cases published since then (David et al, 2006). The most common finding is single or multiple nodules, although pulmonary infiltration is sometimes seen. Pleural effusion has been reported (Kim et al, 2013). Patients may be asymptomatic or present with cough, haemoptysis, dyspnoea or chest pain (Ohta et al, 2018). The differential diagnoses of a pulmonary nodule in a case of syphilis that should be considered and ruled out are primary lung cancer, metastasis,

How to cite this article:
Kaba E, Kaba A, Ardıc C, Celiker FB. Pulmonary involvement of secondary syphilis: the great mimicker. Br J Hosp Med. 2023. https://doi.org/10.12968/hmed.2023.0016

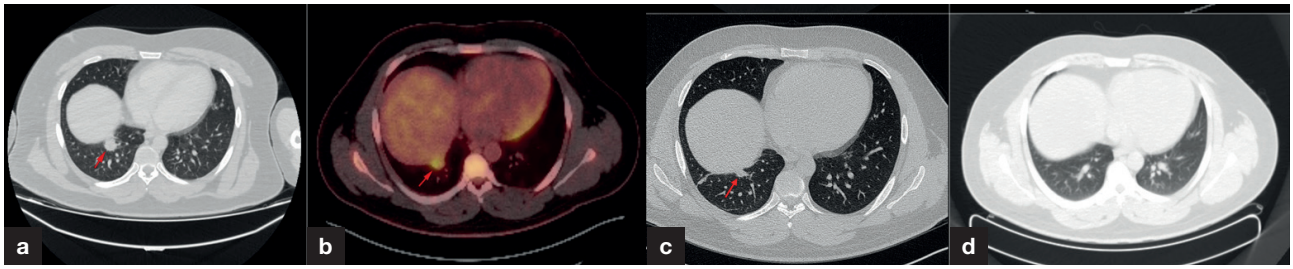

Figure 1. a. Thorax computed tomography showing a spiculated contoured nodule in the lower lobe of the right lung (arrow). b. Positron emission tomography-computed tomography showing nodule (arrow). c. After 3 weeks the nodule had become smaller (arrow). d. After 3 months the nodule had disappeared.

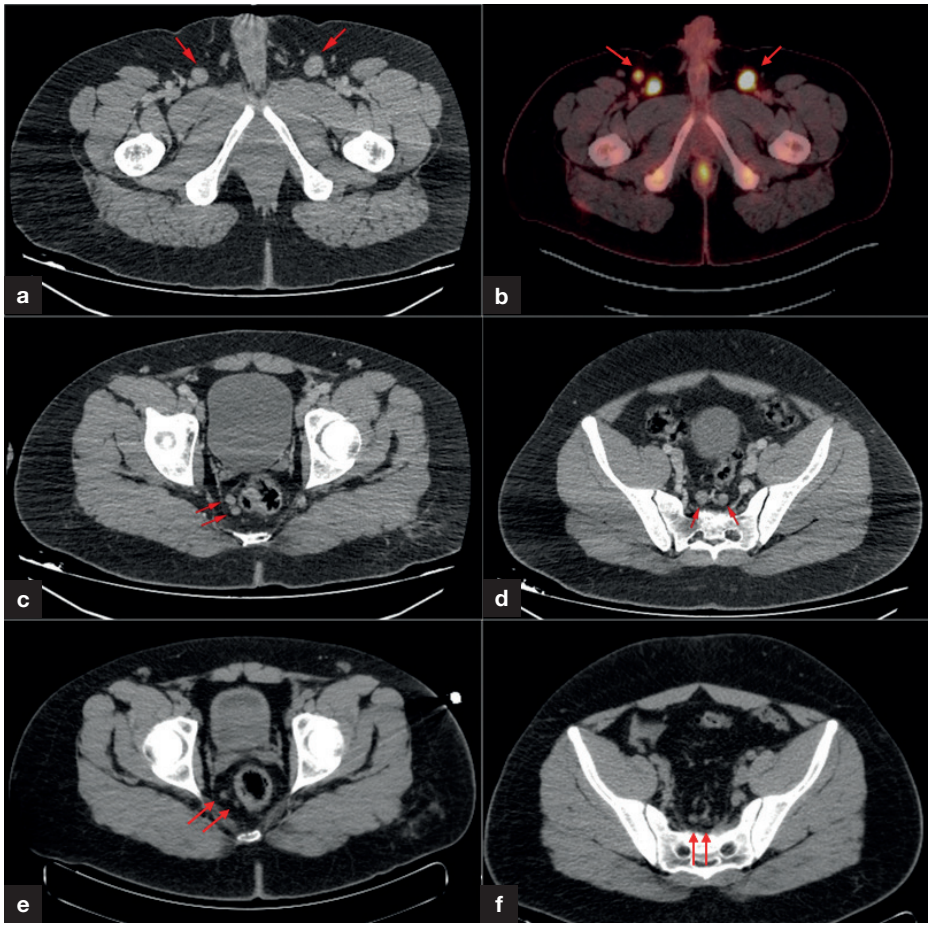

Figure 2. Pelvic computed tomography. a. Bilateral inguinal lymph nodes showing (b) pathological uptake of F-18 fluorodeoxyglucose (arrows). c and d. Pararectal and presacral lymph nodes (arrows) at presentation. e and f. Pararectal and presacral lymph nodes shrunk after 3 months (arrows).

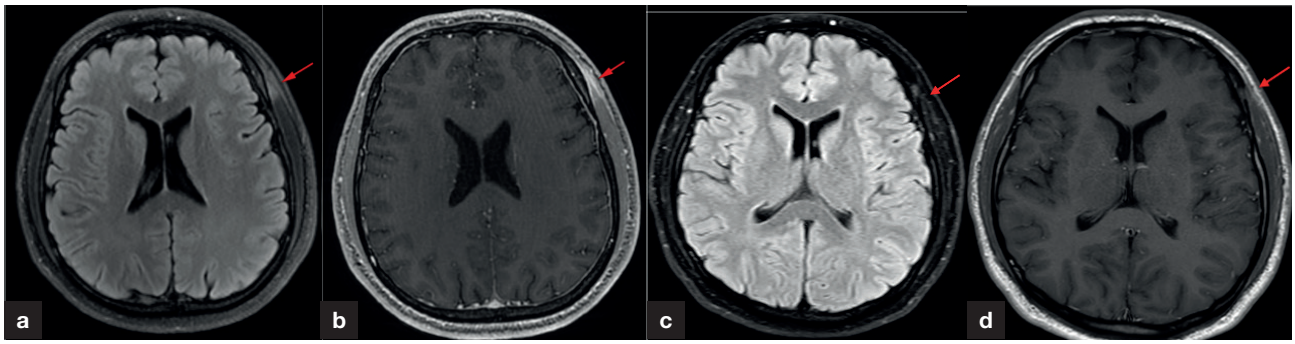

Figure 3. a. FLAIR signal enhancement and (b) contrast enhancement in the anterior temporal muscle (arrows). c, d. No findings are observed in the same location 3 months later .

Table 1. Serological syphilis test results

Date	Test	Result
Initial presentation	Rapid plasma reagin	Positive at 1/32 titre
	Treponema pallidum haemagglutination assay	Positive
6 weeks later	Rapid plasma reagin	Positive at 1/16 titre
	Treponema pallidum haemagglutination assay	Positive
6 months later	Rapid plasma reagin	Negative
	Treponema pallidum haemagglutination assay	Positive

Table 2. Criteria for pulmonary involvement of syphilis

Historical and physical findings characteristic of secondary syphilis
Positive serological test for syphilis
Radiologically visible pulmonary abnormalities, with or without associated lung symptoms or signs
Exclusion of other lung diseases as far as possible by serological tests, cultures and sputum cytology examination findings
Response of radiological findings to treatment

From Coleman et al (1983)

lymphoma, infectious diseases such as tuberculosis, rheumatoid arthritis, granulomatosis with polyangiitis, and septic embolism (Florencio et al, 2019). Coleman et al (1983) defined the criteria for differential diagnosis of pulmonary involvement of syphilis (Table 2).

Diffuse lymphadenopathy is another important presentation of syphilis, with differential diagnoses including metastasis, lymphoproliferative disease, infectious diseases such as tuberculosis, and autoimmune disorders. It is classically seen in the cervical, inguinal and epitrochlear regions (Komeno et al, 2018; Florencio et al, 2019).

When diffuse lymphadenopathy and pulmonary nodules are seen, the differential diagnosis of lymphoma should be ruled out. In this case, lymph node excision and bone marrow biopsy were performed to rule out lymphoma.

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Learning points

- Syphilis is a sexually transmitted disease that has primary, secondary, latent and tertiary stages.
- Pulmonary involvement of syphilis is rare.
- Syphilis may also cause diffuse lymphadenopathy and may mimic lymphoma.
- Syphilis should always be included in the differential diagnosis of pulmonary and lymph node pathologies, especially in men who have sex with men.

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