Pulmonary nodules with a rash

Introduction

Syphilis has long been known as 'the great imitator' because of its wide-ranging presentations in multiple organ systems. This article reports an unusual case of syphilis presenting with pulmonary nodules which created an interesting diagnostic challenge. The patient, a 57-year-old homosexual man, had complete resolution of both the rash and the pulmonary nodules following treatment with penicillin and probenicid.

Secondary syphilis involving the lungs is extremely rare. However, given the recent rapid rise in syphilis cases in the UK, it is important that physicians remain alert to the possibility of this infection, particularly in high risk individuals.

Discussion

Pulmonary involvement in secondary syphilis is extremely rare, with only 15 cases reported in the English literature. Presenting symptoms may include chest pain (most commonly), cough and dyspnoea (Coleman et al, 1983; McCready et al, 2011; Elzouki et al, 2012; Kim et al, 2013; Soares Souza et al, 2015). The radiological findings have demonstrated pulmonary nodules in 10 cases, several of which have shown necrotic centres. Other less frequent findings were pleural effusion, diffuse infiltrates and lower lobe consolidation. This is the first case that has been reported in the UK.

There has been a dramatic increase in the incidence of syphilis in England since 2010, predominantly among men who have sex with men (Public Health England, 2016). The increase in syphilis among this population could be the result of a number of factors which include changing patterns of sexual behaviour, less stigma associated with HIV (Deeks et al, 2013) and hence less condom use (Bourne et al, 2015). Coleman et al (1983) predicted that there would be a re-emergence of syphilis in the context of HIV infection. They described a case of pulmonary syphilis, and proposed criteria for diagnosis (*Table 2*) which are fulfilled in this case.

The classic presentation of primary syphilis is a painless ulcer (chancre) at the site of inoculation. The typical rash of secondary syphilis develops in around 25% of untreated individuals, and is described as coppery red, symmetrically distributed and non-itchy. It shows a predilection for the palms, soles and body folds, where warty lesions 'condylomata lata' may be seen.

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CASE REPORT

A 57-year-old Caucasian male smoker presented to accident and emergency with a short history of pleuritic chest pain. A chest radiograph revealed an ill-defined opacity in the left hilum, so he was referred for an outpatient computed tomography scan of the chest (*Figure 1*). This demonstrated multifocal peripheral nodules and sub-pleural consolidation, the latter with central low attenuation suggestive of necrosis. The appearances were suggestive of an infective or inflammatory process. Blood tests at this stage revealed a mild neutrophilia, raised liver enzymes and a slightly elevated serum angiotensin-converting enzyme level. Autoantibodies, rheumatoid factor and a screen for bloodborne viruses, including HIV, were negative. Serum aspergillus precipitins was also negative.

The patient underwent a computed tomography-guided lung biopsy, but midway through the procedure he was uncomfortable and withdrew his consent. Two core samples were obtained. Histopathological examination was non-diagnostic. Bacterial (including mycobacteria) and fungal cultures were negative.

The respiratory team had noted that the patient had a generalized rash (*Figure 2*) which had started at a similar time to the chest pain. Given the difficulties in obtaining an adequate specimen from the lung, they referred him to dermatology for an opinion on diagnosis and consideration of skin biopsy.

Inspection of the skin showed widespread scaly, erythematous macules and papules affecting the head, trunk, limbs and in particular the palms and soles. There were no genital or oral lesions. The clinical suspicion was of secondary syphilis, which was confirmed serologically (*Table 1*). He was referred to the genitourinary medicine team for treatment. The patient confirmed that he was homosexual, and had recently had sex with multiple casual male partners. The genitourinary medicine team noted that the patient also described recent onset hearing loss and tinnitus, and an audiogram demonstrated sensorineural hearing loss suggestive of involvement of the 8th cranial nerve.

The patient was treated with intramuscular procaine penicillin 2.4 MU once daily, and probenecid orally 500 mg four times daily for 14 days. He was screened for other sexually transmitted infections and contact tracing was undertaken. The rash settled within 8 weeks, his hearing returned, and the liver function tests normalized. HIV serology remained negative when a repeat test was done to cover the window period. A computed tomography scan at 3 months showed resolution of the pulmonary nodules, supporting the clinical diagnosis of secondary syphilis with pulmonary involvement.

Elevation of serum angiotensin-converting enzyme levels can occur in inflammatory lung conditions other than sarcoidosis, including tuberculosis, and hence may explain the small rise seen in this patient (Sahin et al, 2016).

Figure 1. **a.** Axial computed tomography image of the chest demonstrating multifocal sub-pleural nodules in both lung bases (arrows) and **(b)** a right middle lobe sub-pleural nodule with a central low density necrotic focus (arrow).

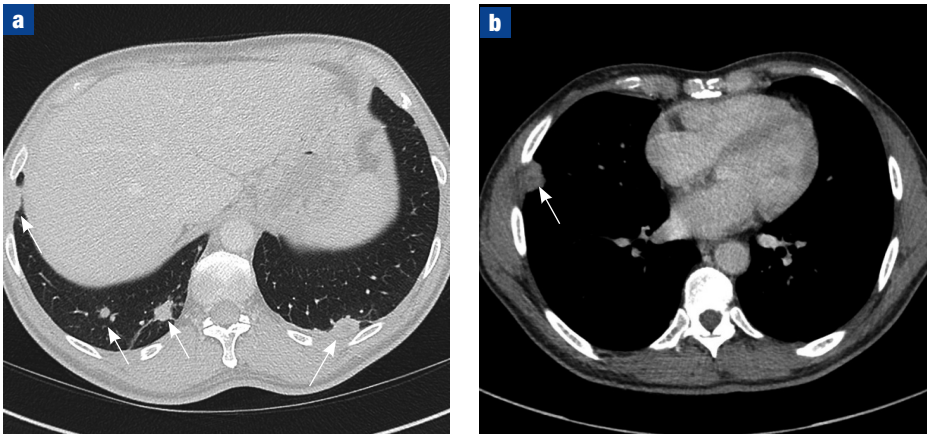

Figure 2. Rash to **(a)** trunk and **(b)** palms.

Table 1. Results of baseline syphilis serology

Syphilis immunoassay	Positive
Rapid plasma reagin	+128
Treponema pallidum particle agglutination assay	+5120
Syphilis IgM	Positive

Table 2. Criteria for diagnosing pulmonary syphilis

History and physical findings typical of secondary syphilis
Serological test results positive for syphilis
Pulmonary abnormalities seen on X-rays with or without associated pulmonary symptoms or signs
Exclusion of other forms of pulmonary disease when possible by findings of serological tests, sputum smears and cultures, and cytological examination of sputum
Therapeutic response to anti-syphilitic treatment visible on radiographs
From Coleman et al (1983)

Neurological involvement is seen in only 1–2% of syphilis cases, and more commonly in association with HIV infection. It may present as an acute meningitis or with cranial nerve involvement, as in this case (Kingston et al, 2016).

Benzathine penicillin G 2.4 MU intramuscular as a single dose remains the treatment of choice for primary and secondary syphilis, but longer courses of procaine penicillin intramuscular with probenicid orally are recommended for neurosyphilis (Kingston et al, 2016). BJHM

LEARNING POINTS

- Secondary syphilis is a rare cause of pulmonary nodules, but may need to be considered in the differential, particularly in high risk individuals.
- The incidence of syphilis has risen dramatically in the past 8 years, particularly among men who have sex with men.
- Syphilis is one of a limited number of acute rashes that has a predilection for the palms and soles. (Other potential causes include hand, foot and mouth disease, measles, Kawasaki disease and erythema multiforme.)
- In an era of increasingly sophisticated investigative techniques, careful clinical examination and interpretation of signs remains an important skill.

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