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More than just Tuberculosis and *Burkholderia cepacia* Pulmonary Co-Infection

Faroek Dinmohamed[1], Dwight Tong Sang[1], Francis T. Mawie[1], Iswardath Thakoer[1], Fitzgerald A. Gopie[1,2]

[1]Academic Hospital Paramaribo, Paramaribo, Suriname
[2]Faculty of Medicine, University of Suriname, Paramaribo, Suriname
Email: fitzgeraldgopie@gmail.com

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Abstract

A male marine mechanic, 45 years of age, had an anamnesis and chest X-ray suitable for miliary Tuberculosis (TB). Diagnosis of drug-sensitive TB was confirmed after bronchoalveolar lavage was performed. *Achromobacter xylosoxidans* and *Burkholderia cepacia* were also detected in the lavage. Eight weeks after treatment with first-line tuberculostatics there was no further clinical improvement nor further resolution of the pulmonary lesions on the follow-up chest X-ray. At this point, trimethoprim/sulfamethoxazole was added to the treatment regimen resulting in progressive improvement of the patient and his chest X-ray.

Keywords

Tuberculosis, *Burkholderia cepacia*, Melioidosis, Sarcoidosis

1. Introduction

This case describes a patient with a miliary pattern on his chest X-ray, the clinical presentation being suspected of pulmonary tuberculosis, which was only confirmed after bronchoalveolar lavage [1]. There was also growth of *Achromobacter xylosoxidans* and *Burkholderia cepacia* in the bronchoalveolar lavage, a rare combination of pathogens to be simultaneously detected [2]. Based on these findings we decided to write a case report after written consent was obtained from the patient.

2. Case Presentation

A 45-year-old male patient was referred to the pulmonologist in August 2025 with a complaint of a 1-year productive cough with yellow sputum expectoration, oc-

casional fever and no night sweats. He experienced weight loss from 80 to 60 kg despite normal appetite and normal food intake. He had no vomiting, no abdominal discomfort nor diarrhea. His medical history was unremarkable, with some use of beer, no drug use and no tobacco use. Being occupied as a marine mechanic for 20 years the patient has exposure to diesel fumes and has a side job as a gardener with occasional use of the herbicides glyphosate and paraquat and not always wearing personal protective equipment. His physical examination was unremarkable, with a peripheral oxygen saturation of 95% at ambient conditions, temperature of 36.3˚ Celsius, respiration rate of 16 per minute and normal breath sounds at pulmonary auscultation. Figure 1 shows the presenting chest X-ray.

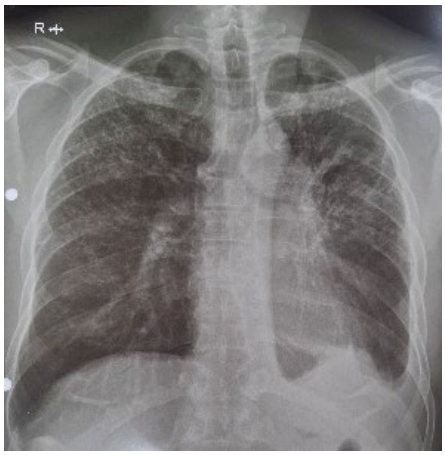

Figure 1. Chest X-ray at presentation on August 19th, 2025. Miliary and reticular pulmonary consolidations predominantly in the upper portions of the lungs and blunting of both the sinus pleurae.

A differential diagnosis of Pulmonary Tuberculosis (PTB), sarcoidosis, opportunistic pulmonary infection and fibrotic pulmonary lesions caused by diesel fumes or herbicide inhalation was considered. Laboratory evaluation showed an elevated CRP value of 8 mg/dl and normal: hemoglobin, white blood cell count, thrombocytes, kidney and liver functions, Calcium, albumin and total serum protein, and also normal thyroid function. The HIV test was negative and urine screening was normal. Tracheal lavage was performed with the Gram stain showing some leucocytes and erythrocytes, Gram-negative rods and lots of Gram-positive cocci, but no growth of specific bacteria. Screening for TB with Ziehl Neelsen stain was negative. This result prompted chest CT scanning which showed bilateral nodular subpleural consolidations with thickened interlobular septation accompanied by tree-in-bud and thickening of the neurovascular bundle, with the basal lung fields not being affected. Besides enlarged hilar and mediastinal lymph nodes there was also some left-sided pleural fluid; as such the findings indicated pulmonary TB or sarcoidosis. In order to reach a diagnosis of either disease bronchoscopy was performed to obtain Broncho Alveolar Lavage (BAL) for examination [3] [4]. Bacterial examination of BAL fluid showed 3+ positive acid-fast bacilli in the Auramine staining which was confirmed to be rifampicin-sensitive *Myco-*

bacterium tuberculosis by the Xpert MTB/RIF ultratest (Cepheid AB Sweden). Culture of the specimen confirmed growth of *Mycobacterium tuberculosis*, but drug susceptibility testing which is done abroad by the RIVM in the Netherlands needs to be done yet. Also, there was growth of some *Achromobacter xylosoxidans* (*A. xylosoxidans*) and abundant growth of *Burkholderia cepacia* (*B. cepacia*) identified by the Bruker MALDI Biotyper), both organisms being sensitive to trimethoprim/sulfamethoxazole and meropenem. On the 7th of November 2025 first line tuberculostatic treatment (isoniazid, rifampicin, ethambutol and pyrazinamide) was started and a follow-up chest X-ray was done on the 27th of November, showing an increase in the pulmonary lesions (**Figure 2**).

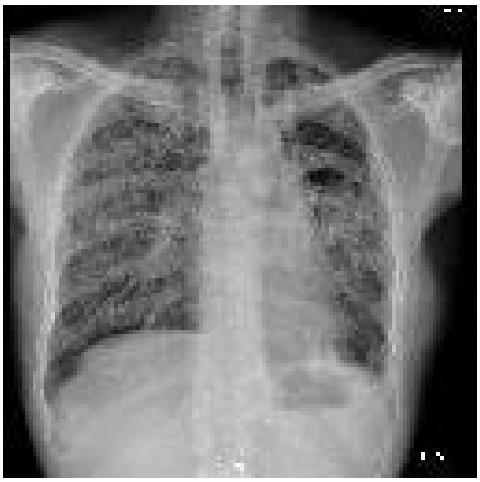

Figure 2. Chest X-ray November 27th, three weeks after treatment with first line tuberculostatics, showing an increased reticular pattern.

Nevertheless, the tuberculostatics were continued and the follow up chest X-ray of December 17th showed decrease in the pulmonary lesions as seen in **Figure 3**. Although tuberculostatic treatment was continued the chest X-ray of December 29th showed no further progress towards normalization (**Figure 4**). Although the patient had a chest X-ray consistent with miliary tuberculosis, clinical evaluation and repeat laboratory results did not give reason to suspect disseminated TB. This stagnation in improvement of the clinical situation and of the chest X-ray as well, leads us to conclude that the abundant growth of *B. cepacia* in the BAL fluid was not a colonization. As no alternative reason could be identified for the lack of improvement it was at this point that *B. cepacia* was considered a co-infection and trimethoprim/sulfamethoxazole 2 × 960 mg was added to the treatment regimen (G. M. Ederer, J. M. Matsen. https://doi.org/10.1093/infdis/125.6.613). This resulted in additional decrease of the pulmonary lesions as can be seen on the chest X-ray of the 2nd of February 2026 (**Figure 5**)**.** Adverse drug reactions due to the (combined) treatment regimen were monitored by clinical examination and laboratory testing. Hepatotoxicity, nephrotoxicity, neuropathy, skin lesions, gastrointestinal symptoms or hematologic disorders were encountered. Currently, the patient is doing well and continues his treatment with first-line tuberculostatics and

trimethoprim/sulfamethoxazole, the latter to be prescribed for 20 weeks.

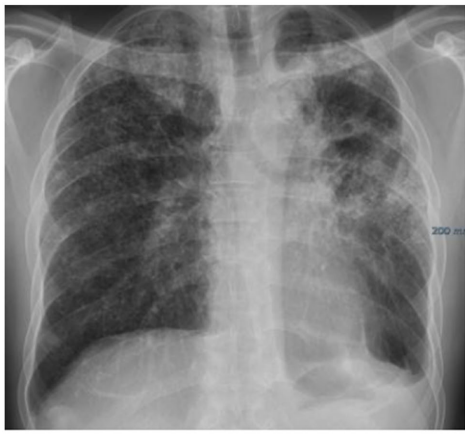

Figure 3. Improvement of chest X-ray December 17th with continuation of tuberculostatics.

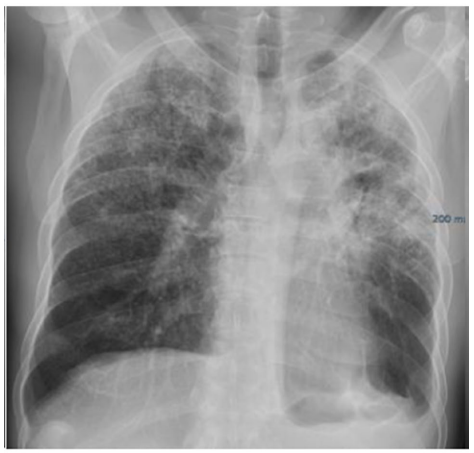

Figure 4. No further improvement of chest X-ray December 29th despite continuation of tuberculostatics.

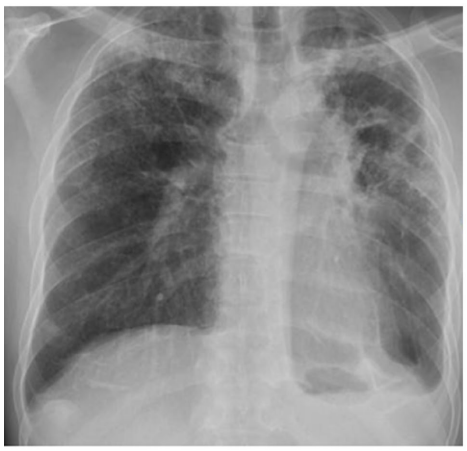

Figure 5. Evident improvement of chest X-ray February 2nd with trimethoprim/sulfamethoxazole added to tuberculostatic regimen.

3. Discussion

Our patient had an anamnesis and chest X-ray strongly suggestive of miliary pulmonary tuberculosis but the clinical diagnosis was not confirmed at initial evaluation. The ensuing re-evaluation resulted in the detection of tuberculosis and 2 other bacterial pathogens in the BAL fluid. B. cepacian [5] and *A. xylosoxidans* [6] were initially not considered to be pathogenic because the patient had no structural pulmonary damage, was not immunocompromised and had no evidence of cystic fibrosis. Hence, the patient was treated only for pulmonary tuberculosis resulting in clinical improvement at first, but worsening of the chest X-ray after 3 weeks of treatment. This paradoxical worsening of the chest X-ray after treatment of an immunocompetent patient was considered a sequelae [7] of PTB. As such treatment with tuberculostatics was continued, which resulted in an improved chest X-ray at 6 weeks of TB treatment. In the 8th week of TB treatment there was no further clinical improvement and the accompanying chest X-ray showed increase in pulmonary consolidations. In the absence of an alternative explanation this unexpected finding was ascribed to a co-infection with *B. cepacian* [2], a multidrug-resistant bacterium [8]. Trimethoprim/sulfamethoxazole [9] supplementary treatment resulted in additional clinical improvement and obvious reduction of pulmonary lesions some 4 weeks later. The course of recovery suggests there is a pulmonary infection with at least tuberculosis and *B. cepacia*. *A. xylosoxidans* is considered an opportunistic nosocomial bacterium that can colonize the respiratory tract and cause infections in patients with underlying conditions such as cystic fibrosis [6]. As our patient does not have any of these diseases we assume *A. xylosoxidans* is not a causative agent. In case we have misjudged the presence of this bacterium it is eventually being co-treated with the already administered trimethoprim/sulfamethoxazole regimen [10]. Although our patient has occupational exposure to diesel fumes, paraquat and glyphosate (agents capable of causing pulmonary injury [11] [12], it is currently not possible to evaluate their harmful effect on the lungs. Pulmonary lesions related to these occupational agents can be the same as those inflicted by *B. cepacia* and TB [13]. As complete resolution of pulmonary lesions caused by TB and *B. cepacia* is possible [2] [14] future pulmonary complaints could be ascribed to exposure to the occupational agents. Even though the course of the disease shows a favourable course there are points of concern regarding our case. First there was no TB GenXpert test done on the tracheal lavage. Although screening with the Ziehl-Neelsen stain was negative for tuberculosis, the GenXpert test is superior at detecting tuberculosis [15]. Secondly, due to limited diagnostic capability [16] our microbiology laboratory is not able to detect or identify *Burkholderia pseudomallei*. As specimens need to be sent abroad for further analysis, we could not rule out the *B. cepacia* to actually be B. pseudomallei. Because we take into account that our patient could actually have a co-infection with *B. pseudomallei* we intend to treat for 20 weeks with trimethoprim/sulfamethoxazole [17]. Simultaneous infection with TB and *B. pseudo-*

mallei is also considered a rare presentation [18] [19]. TB and *B. cepacian* co-infection is also rare [2] [20].

4. Conclusion

Co-infection with tuberculosis and Burkholderia species considered to be a rare occurrence may be more common than thought. If we focus only on tuberculosis because of the anamnesis and chest X-ray we might miss pulmonary co-infection with other micro-organisms.

CRediT Author Contributions

F. D.: data curation, reviewing, writing, resources, D. T. S.: data curation, I. T.: data curation, reviewing, writing, resources, F. A. G.: conceptualization, data curation, original draft preparation, resources, supervision.

Conflicts of Interest

We have no conflict of interest to report, nor have we received any funding for the preparation of this case report.

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