Case Report

Melioidosis masquerading as metastatic lung disease: A diagnostic challenge from coastal Karnataka, India

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ABSTRACT

Melioidosis, caused by *Burkholderia pseudomallei*, is an emerging infectious disease in India that can closely mimic tuberculosis or malignancy, leading to diagnostic delays and mismanagement. A 54-year-old diabetic farmer from coastal Karnataka presented with fever, dry cough, anorexia, and weight loss. Imaging revealed multiple bilateral pulmonary nodules with intense fluorodeoxyglucose uptake on positron emission tomography-computed tomography (CT), suggestive of metastatic malignancy. CT-guided lung biopsy showed suppurative granulomatous inflammation, and both blood and tissue cultures confirmed *B. pseudomallei*. The patient received intravenous meropenem for 3 weeks followed by oral trimethoprim-sulfamethoxazole for 12 weeks, resulting in complete clinical recovery and radiological resolution. This case highlights the importance of considering melioidosis as a differential diagnosis for metastatic-appearing lung lesions in endemic regions, particularly among diabetics with soil exposure. Early microbiologic confirmation is crucial to avoid unnecessary oncologic evaluation and ensure effective antimicrobial therapy.

Key words: *Burkholderia pseudomallei*, Diabetes mellitus, Melioidosis, Positron emission tomography-computed tomography, Pulmonary nodules

Melioidosis is a life-threatening infection caused by *Burkholderia pseudomallei*, a motile, environmental saprophyte widely present in soil and surface water. Once considered confined to Southeast Asia and northern Australia, it is now increasingly recognized in India, especially in coastal regions such as Karnataka and Kerala [1-3]. Recent modeling studies estimate that India may account for nearly 10–15% of global melioidosis cases, potentially over 50,000 annually [4]. However, underdiagnosis remains a significant concern due to a lack of clinical awareness and laboratory capacity [5]. Pulmonary melioidosis is the most common form of the disease and often mimics tuberculosis or malignancy on imaging [6]. The presence of multiple cavitating lung nodules with high fluorodeoxyglucose (FDG) uptake frequently leads to a mistaken diagnosis of metastatic disease.

This case is reported to highlight how melioidosis can closely mimic metastatic malignancy on positron emission tomography-computed tomography (PET-CT) imaging in an endemic coastal region of India. Awareness of this diagnostic challenge is essential for physicians managing diabetic or agricultural patients presenting with multiple pulmonary nodules.

Access this article online	
Received - 14 October 2025 Initial Review - 01 November 2025 Accepted - 10 November 2025	Quick Response code
DOI: 10.32677/ijcr.v11i12.7906	

CASE REPORT

A 54-year-old male farmer from rural Mangalore, Karnataka, presented during the post-monsoon season (September 2024) with a 3-week history of high-grade intermittent fever (maximum 39.2°C), rigors, night sweats, anorexia, and unintentional weight loss of approximately 8 kg. He also reported a progressive dry cough and fatigue. He denied chest pain, hemoptysis, dyspnea, or contact with tuberculosis patients. His medical history included type 2 diabetes mellitus (diagnosed 18 months earlier; HbA1c 9.8 %), systemic hypertension, and prior coronary artery stenting for single-vessel disease 2 years earlier. Medication adherence was inconsistent due to financial constraints. He was a lifelong non-smoker and non-alcoholic.

The patient appeared ill but alert. Vital signs were as follows: temperature 38.4°C, heart rate 96/min, respiratory rate 22/min, blood pressure 148/86 mmHg, and oxygen saturation 94% on 2 L/min oxygen. No

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pallor, clubbing, or lymphadenopathy. Bilateral basal fine crackles were present. Other systemic findings were unremarkable.

Laboratory results showed hemoglobin 11.2 g/dL, leukocyte count 27,500/mm^3 (83.9% neutrophils), and platelets 385,000/mm^3. C-reactive protein (CRP) 357 mg/L, erythrocyte sedimentation rate 132 mm/h, and procalcitonin 4.2 ng/mL. Random glucose was 423 mg/dL, serum creatinine was 2.0 mg/dL, blood urea nitrogen was 84 mg/dL, aspartate aminotransferase was 102 U/L, alanine aminotransferase was 89 U/L, and albumin was 2.8 g/dL. Arterial blood gas showed mild hypoxemia ($pO_2$68 mmHg).

Chest radiograph showed bilateral patchy opacities. Contrast-enhanced computed tomography of the chest revealed multiple bilateral nodules (8 mm–3.2 cm), some cavitating with rim enhancement and ground-glass halos, and mediastinal lymphadenopathy (nodes up to 1.8 cm) (Fig. 1). A small left pleural effusion was also seen. The radiologic appearance suggested metastatic malignancy. A PET-CT scan demonstrated intense FDG uptake in multiple nodules (SUVmax 8.2–14.7) and mediastinal nodes (SUVmax 6.8–11.4), with no extrapulmonary primary lesion (Fig. 2), strongly suggesting metastases [5].

Computed tomography (CT)-guided biopsy from a right upper-lobe nodule revealed suppurative granulomatous inflammation with central necrosis, epithelioid and multinucleated giant cells, and no evidence of malignancy. Special stains for fungi and acid-fast bacilli were negative.

Blood cultures grew Gram-negative bacilli after 48 h of incubation. MALDI-TOF mass spectrometry confirmed *B. pseudomallei*, sensitive to meropenem, ceftazidime, and trimethoprim-sulfamethoxazole, and resistant to aminoglycosides. Lung tissue culture yielded the same organism, confirming pulmonary melioidosis [7].

The patient was started on intravenous (IV) meropenem 1 g every 8 h for 3 weeks, along with strict glycemic control and supportive care [8]. Fever resolved within 4 days, appetite improved by day 7, and inflammatory markers declined significantly (CRP 357→45 mg/L). Renal function normalized by discharge. He was transitioned to oral trimethoprim-sulfamethoxazole 160/800 mg twice daily for 12 weeks as eradication therapy [9]. Follow-up CT after completion of therapy showed near-complete resolution of lesions (Fig. 3). The patient remained asymptomatic and resumed agricultural work.

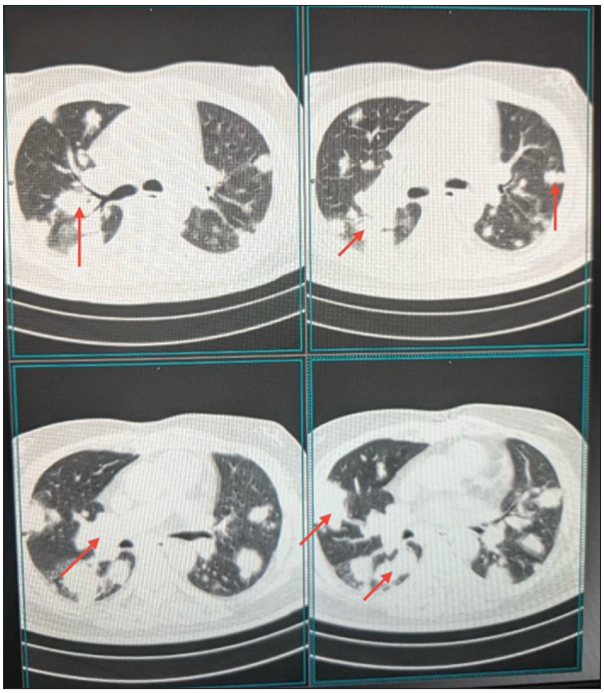

Figure 1: Contrast-enhanced computed tomography demonstrating bilateral nodular opacities suggestive of metastatic malignancy

DISCUSSION

Pulmonary melioidosis is the commonest clinical form of *B. pseudomallei* infection [1]. In India, cases are rising, particularly from the Western coast (Kerala, Karnataka,

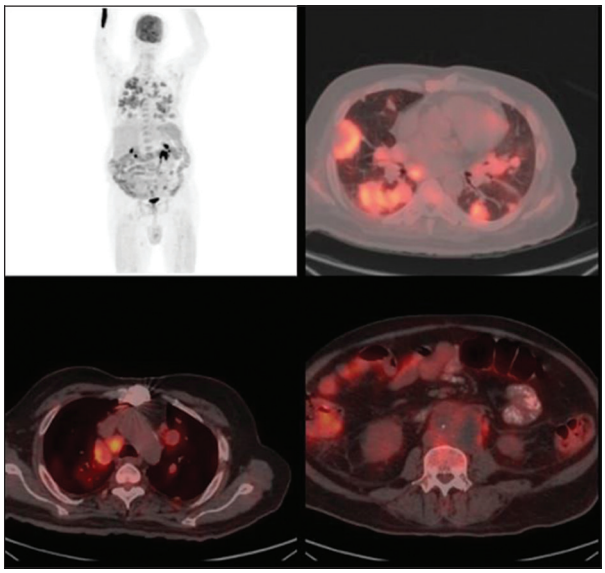

Figure 2: Positron emission tomography-computed tomography showing fluorodeoxyglucose uptake in nodules and lymph nodes suggestive of malignancy

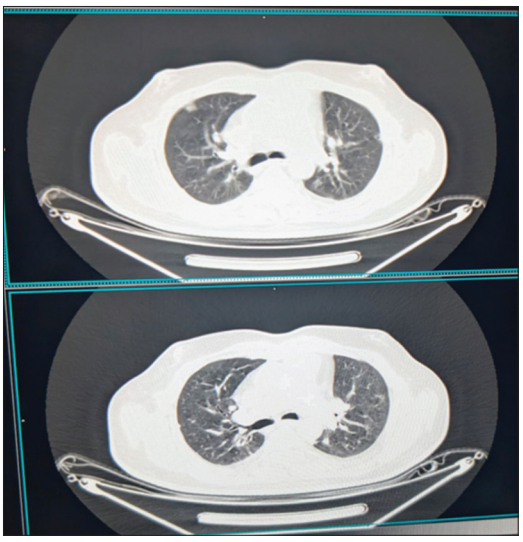

Figure 3: Follow-up computed tomography showing resolution of lesions

Tamil Nadu) [4,9]. The infection is often mistaken for tuberculosis or metastatic cancer, delaying correct treatment [6,10].

Several case reports document similar presentations: Veluthat *et al*. reported pulmonary melioidosis initially treated as tuberculosis before diagnosis by culture [11]. Gadsby *et al*. described mediastinal melioidosis mimicking metastatic lung cancer [6]. Dubey *et al*. published an Indian case series emphasizing diagnostic delay in diabetics [12]. Pitman *et al*. demonstrated improved outcomes with meropenem in severe disease [8]. Pande *et al*. reported a fatal disseminated case from India in a diabetic farmer [13].

PET-CT findings in melioidosis can mimic malignancy due to intense FDG uptake in inflammatory granulomas [6]. This case mirrors previously documented misdiagnoses where patients underwent oncologic evaluation before microbiological confirmation [14,15].

This case highlights the need for increased awareness among emergency physicians, internists, and pulmonologists who may encounter similar presentations. Educational initiatives targeting these specialties could improve early recognition and appropriate management [5]. Diagnostic capacity for melioidosis also needs strengthening, as many laboratories may misidentify *B. pseudomallei* as a contaminant unless specifically requested.

Multiple cavitating pulmonary nodules may result from: metastatic malignancy (thyroid, renal, or choriocarcinoma), pulmonary tuberculosis, septic emboli, granulomatosis with polyangiitis, and fungal infections (*Aspergillus*, *Histoplasma*). Accurate differentiation relies on microbiologic cultures and histopathology rather than imaging alone. Diabetes mellitus remains the predominant risk factor (up to 60% of cases) due to impaired neutrophil function and reduced cytokine response [7]. Exposure to contaminated soil and water during monsoon agriculture facilitates infection [5,9].

A two-phase regimen—IV ceftazidime or carbapenem followed by oral trimethoprim-sulfamethoxazole—is recommended [8]. Relapse can occur in up to 25% of cases if eradication therapy is inadequate [13]. Early microbiologic confirmation and strict glycemic control are essential for good outcomes.

CONCLUSION

Pulmonary melioidosis should be considered in diabetic patients presenting with multiple FDG-avid lung nodules in endemic regions such as coastal Karnataka. Early culture-based diagnosis prevents misdiagnosis as malignancy and facilitates targeted therapy. A high index of suspicion, especially in agricultural workers, can ensure timely cure and prevent relapse.

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Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Bharath GO, Bharadwaj A, Kumar V, Kedarnath BV, Salfi PK, Minaz NS, *et al*. Melioidosis masquerading as metastatic lung disease: A diagnostic challenge from coastal Karnataka, India. Indian J Case Reports. 2025;11(12):647-649.