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CASE REPORT

Pulmonary Lophomoniasis: An overlooked cause of non-resolving pneumonia.

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ABSTRACT

Lophomonas blattarum is a multiflagellated protozoan that occasionally causes pulmonary infection but is often misdiagnosed as bacterial pneumonia, lung mass, or tuberculosis. We report the case of a 49-year-old immunocompetent Indian woman who presented with a 3-month history of productive blackish sputum and occasional hemoptysis, unresponsive to multiple antibiotic courses. Imaging showed left upper lobe collapse-consolidation with bronchial obstruction. Bronchoscopy revealed copious secretions, and bronchoalveolar lavage microscopy demonstrated motile *L. blattarum* trophozoites, while bacterial, fungal, and mycobacterial stains and cultures were negative. The patient was treated with oral metronidazole for 15 days, leading to complete resolution of symptoms and radiological findings. This case highlights the importance of considering pulmonary lophomoniasis in patients with chronic or antibiotic-refractory pneumonia. Bronchoscopy with bronchoalveolar lavage (BAL) remains the diagnostic method of choice, and metronidazole therapy is highly effective. Greater awareness of this emerging infection is needed to prevent misdiagnosis and to better define its epidemiology.

Keywords: Lophomonas blattarum, pulmonary lophomoniasis, bronchoalveolar lavage, protozoal lung infection, chronic cough

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1. INTRODUCTION

Lophomonas blattarum is an anaerobic, multi-flagellated protozoan of the order Parabasalia, typically residing in the hindgut of cockroaches and termites. (1,2) Human pulmonary infection with *L. blattarum* is emerging but remains rare. More than 90% of reported cases have been described in Asia, particularly in China and India. (2,3) Transmission is thought to occur through inhalation of aerosols contaminated with infective cysts, which excyst in the respiratory tract and release motile trophozoites capable of adhering to and damaging bronchial epithelium. (4,5) Clinically, lophomoniasispresents with nonspecific respiratory symptoms, including chronic cough, sputum production (sometimes blood-streaked), and wheezing. Fever is often absent or mild, and symptoms can easily mimic bacterial pneumonia, tuberculosis, or asthma. (3,6) Standard antibacterial therapy is ineffective (7). Diagnosis relies on microscopic visualization of trophozoites in BAL or sputum, supported by special stains or molecular techniques to differentiate from bronchial epithelial cilia (6,8). Treatment with metronidazole typically leads to rapid recovery. (3,7,9) In this report, we describe a case of pulmonary lophomoniasis presenting as chronic, antibiotic-refractory pneumonia to increase the awareness of this rare and underestimated parasitic pulmonary type of infection and highlight the diagnostic importance of bronchoscopy and BAL examination.

2. CASE PRESENTATION

A 49-year-old Indian woman presented with a 3-month history of productive cough with thick, blackish sputum and occasional haemoptysis. She denied fever, chest pain, dyspnoea, or weight loss, although she reported intermittent night sweats. Appetite and activity were preserved. She had no history of tuberculosis, immunosuppression, or chronic illness, except for well-controlled essential hypertension on amlodipine. Physical examination was unremarkable regarding vital signs, with a normal chest examination. Basic blood tests, including CBC, CRP, ESR, and liver and renal function, were within normal levels. The PPD test was negative. However, an HIV test was not done.

Several empiric antibiotic courses had been prescribed elsewhere without improvement. A chest radiograph showed a strandy opacity in the left upper zone. (Figure 1,A) High-resolution CT revealed collapse-consolidation of the left upper lobe with obliteration of the corresponding bronchus. (Figure 2)

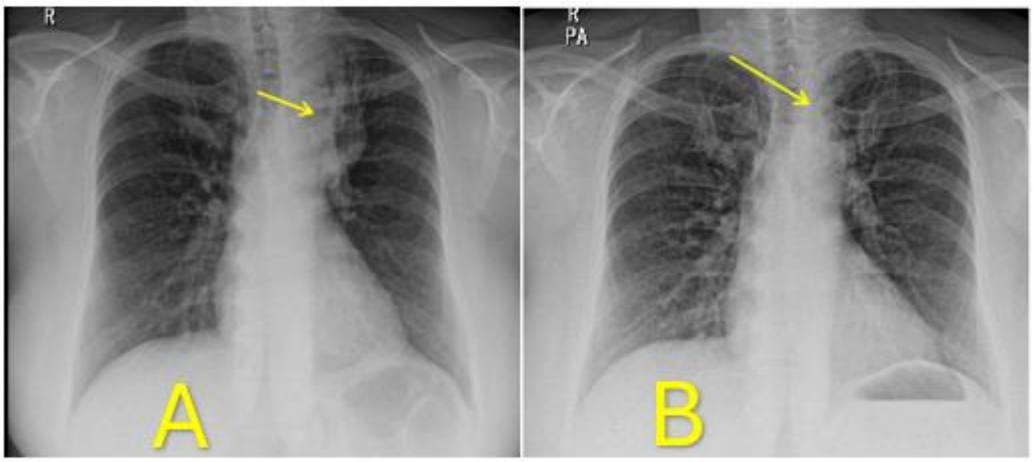

Figure 1. Chest X-ray showing left upper lobe opacity (arrow) at presentation (A) and complete clearance at 6 weeks (B).

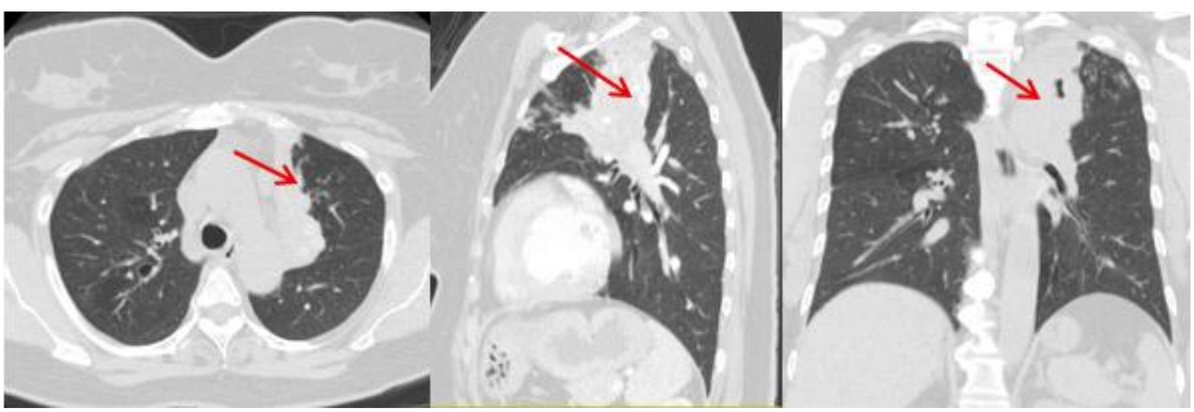

Figure 2. CT scan with collapse-consolidation of the left upper lobe at presentation (arrow).

Flexible bronchoscopy demonstrated obstruction of the left upper lobe segmental bronchus by copious yellowish secretions. Lavage with normal saline and suction removed large volumes of turbid fluid, opening the bronchial segments. (Figure 3)   BAL fluid was sent for microbiological studies. Routine bacterial, fungal, and mycobacterial stains and cultures were negative. Direct wet-mount microscopy revealed large, ovoid protozoa with tufted anterior flagella, moving actively, consistent with *Lophomonas blattarum*. (Figure 4)

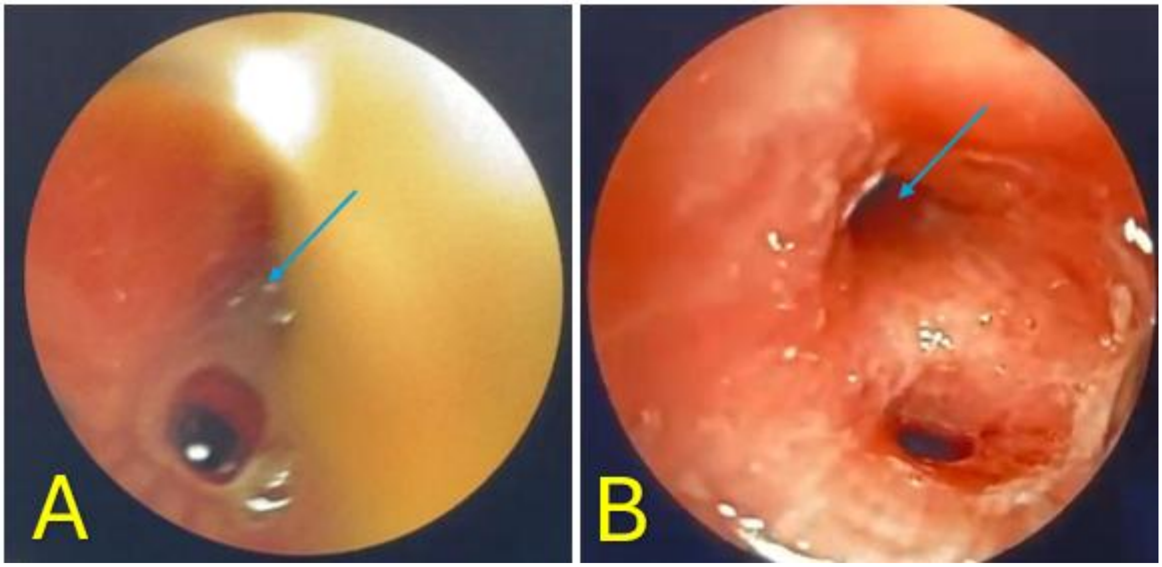

Figure 3. Bronchoscopy View Before (A) and After (B) Bronchoalveolar Lavage, showing resolution of obstruction in the left upper segmental bronchus (Arrow).

Figure 4. Wet-mount BAL microscopy showing motile *Lophomonas blattarum*. (arrows).

The patient was started on oral metronidazole 400 mg three times daily for 15 days. Symptoms resolved within a week. A repeat chest radiograph at two and six weeks demonstrated complete clearance of the left upper lobe opacity. (Figure 1. B) At six weeks follow-up, she remained asymptomatic and clinically well.

3. DISCUSSION

Pulmonary lophomoniasis remains a poorly recognized parasitic infection whose symptoms often mimic more common respiratory diseases such as bacterial pneumonia, tuberculosis, bronchiectasis, or asthma. (2,3,6) Because of this overlap and the general lack of clinical suspicion, diagnosis is frequently delayed or missed. Our patient exemplifies these challenges; she received several courses of antibiotics with no improvement until bronchoscopy and bronchoalveolar lavage (BAL) microscopy confirmed the presence of *Lophomonas blattarum*.

Although *L. blattarum* is traditionally considered an opportunistic organism, cases have now been reported in both immunocompromised and immunocompetent individuals. (3,6,11) The growing number of reports from India, China, and Latin America suggests that the parasite may be more widespread than previously appreciated. (2,6,7,10,) Transmission appears to be associated with environmental exposure, particularly in settings with cockroach infestation or poor sanitation. (1,5) Interestingly, our patient had no clear exposure history, highlighting that infection can occur even in those without apparent risk factors.

One of the main diagnostic challenges lies in distinguishing *Lophomonas* trophozoites from detached ciliated bronchial epithelial cells, as their appearance under light microscopy can be deceptively similar. (6,8). This resemblance is well documented, and recent work,including Mewara (2024),emphasizes the risk of overdiagnosis when relying solely on light microscopy, especially in the absence of molecular confirmation. (12) This limitation applies to the present case. While the organisms we observed exhibited the characteristic size (20–60 µm), granular cytoplasm, and anterior tuft of flagella, and demonstrated true motility, the lack of PCR confirmation means that diagnostic uncertainty cannot be completely excluded. When available, adjunctive methods such as Giemsa staining, trichrome staining, or PCR can significantly improve diagnostic specificity. (8,11)

Radiologic findings in pulmonary Lophomoniasis are generally nonspecific, ranging from patchy infiltrates to lobar collapse. (6,11) The left upper lobe collapse seen in our patient could easily have been mistaken for bacterial pneumonia, tuberculosis, or even malignancy. This underscores the value of bronchoscopy in investigating persistent or unexplained pulmonary opacities.

A further limitation concerns the mycobacterial workup. Although routine cultures were reported as negative, the incubation period for mycobacterial cultures was not documented. Given that *Mycobacterium tuberculosis* may require 6–8 weeks of incubation, the possibility of an early false-negative result cannot be entirely excluded. Explicit reporting of the culture duration is therefore important in future cases.

Treatment with metronidazole remains the mainstay of therapy. (7,9) Patients usually experience a rapid and marked improvement in both clinical symptoms and radiologic appearance, as was evident in our case. Other nitroimidazole derivatives have also shown efficacy, though data are limited. (7,9,11) Prompt diagnosis and treatment are crucial, as delayed therapy may allow disease progression or contribute to chronic lung damage. (2,3,11)

Nevertheless, the therapeutic response in our patient should be interpreted cautiously. Clinical improvement after metronidazole is not pathognomonic, as the drug possesses anti-inflammatory and anaerobic antibacterial properties. Additionally, bronchoscopic aspiration of obstructive secretions can itself lead to significant improvement in obstructive pneumonias, and some spontaneous recovery cannot be excluded. These alternative explanations represent a significant source of therapeutic confirmation bias and should be acknowledged when interpreting outcomes in the absence of definitive molecular diagnosis.

From a public health standpoint, greater awareness of pulmonary Lophomoniasis is especially important in regions where cockroach exposure is common and tuberculosis is endemic. Misdiagnosis as tuberculosis has been reported, leading to unnecessary antitubercular treatment and delay in appropriate therapy. (6,7,10) Wider use of molecular diagnostic tools such as PCR (12) could enhance detection and help define the true epidemiological scope of this overlooked protozoal infection.

4. CONCLUSION

Pulmonary lophomoniasis, although rare, should be included in the differential diagnosis of chronic or antibiotic-refractory pneumonia, even in immunocompetent individuals without obvious exposure risks. This case underscores the pivotal role of bronchoscopy with BAL examination in evaluating persistent lobar opacities and highlights the diagnostic difficulty of relying on light microscopy alone, given the potential for misidentification with ciliated epithelial cells and the absence of molecular confirmation. While the patient’s rapid clinical and radiologic improvement after metronidazole was striking, alternative explanations, including the non-specific effects of metronidazole and the therapeutic benefit of bronchoscopic aspiration, must be acknowledged. Greater clinical awareness, careful interpretation of microscopy findings, proper documentation of mycobacterial culture duration, and broader access to confirmatory techniques such as PCR are essential to improve diagnostic accuracy and better define the true epidemiological burden of this overlooked protozoal infection.

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