

Lophomonas Blattarum Respiratory Infection in an Immunocompromised Patient: A Case Report from Dubai

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Abstract- The paper examines a case study of a patient with an immunocompromised condition who contracted a respiratory infection caused by *Lophomonas Blattarum*. *Lophomonas Blattarum* is a flagellated protozoan commonly found in cockroaches and is known to cause respiratory infections in humans, although it is rare. The paper highlights the clinical manifestations and diagnosis of the infection and the management and treatment strategies used to treat the patient. The study emphasizes the importance of considering *Lophomonas Blattarum* as a possible cause of respiratory infections, especially in immunocompromised patients. The findings of this study could help healthcare providers improve the diagnosis and management of this rare but potentially fatal infection in immunocompromised patients.

Index Terms- *Lophomonas Blattarum*, Protozoan Infection, Respiratory Infection, Immunocompromised Patient.

I. INTRODUCTION

Morphological and Pathogenic Characteristics

Even though a parasitic lung and pleura infection is low, parasites may sometimes cause severe problems and bronchial complications, especially in immunocompromised patients. Among parasites, *Lophomonas blattarum* may occasionally cause bronchopulmonary infection in humans (Yao, 2008; Wu & Liu, 2010; Zhang et al., 2011). These protozoa more commonly infect patients with significant defects in the immune system. *Lophomonas blattarum* can live in the hindgut of certain arthropods like termites, omnivorous roaches (Strand & Brooks, 2013), and several cockroach species like *Blatta orientalis* (Kudo, 1926; Semans, 1941). Digestion of nutrients, particularly lignocellulose can be facilitated by this protozoan in the hindgut of the cockroaches (Trager, 1932; Wharton et al, 1965). It has also been observed in the feces of birds, such as bustards (Silvanose et al., 1999) *Periplaneta americana* (Hoyte, 1961a), and *Blattella germanica* (Tsai & Cahill, 1970). *Lophomonas blattarum* can enter the respiratory tract of a human body through the pharynx or by inhalation of dust containing *Hypermastigote* (Chen and Meng, 1993).

Morphological Features

Lophomonas blattarum is circular, oval, or piriform in shape, with a length of about 20–60 mm and a width of about 12–20 mm. The cytoplasm is granular, with phagocytosed food particles. A bunch of flagella with an irregular orientation are present at the apical zone (the outer flagella of the bunch are smaller and separate). The nucleus may be seen as a round dark body situated a short distance under the insertion of the flagella (Butschli, 1879).

Clinical Symptoms and Manifestation

Clinical symptoms of lophomoniasis revealed fever, cough, expectoration, chest pain, and shortness of breath. The chest X-ray shows pulmonary double limited inflammatory infiltrations. Nevertheless, as the disease progresses or with other pathogenic infections, patients may present expectoration of phlegm, usually white or yellow purulent sputum and bloody sputum. The body temperature may elevate to 38°C - 39°C (Kanga et al, 2005, Kangb et al, 2005 and Kang et al, 2008).

Medical Laboratory Diagnosis

The identification of this protozoan in human samples has been based on identifying morphological features under light microscopy using fresh and stained samples from the airways, including sputum, bronchoalveolar lavages, bronchial brushings, and tracheal aspirates.

Depending on the different extent of the lesions, examination of the lungs with X-ray and CT showed shadowy bronchial thickening, and alveolar exudates, increased lung markings, which can be scattered in different patchy shadows, edge blur, hilar density increased,

manifestations of pneumonia or pulmonary interstitial inflammatory have changed. Lung abscess, pleural effusion, central bronchiectasis with infection, and bronchitis with right lower pneumonia have also been demonstrated. In addition, the chest showed that t patchy, nodular, cord-like infiltrates in the lung on the middle and lower field [Zhou et al, 2006, Shi et al, 2007, Liu et al, 2007]. Although respiratory infection by *L. blattarum* is rare, to the best of our knowledge, there are 62 published case reports, of which 53 cases were from China, six cases from Peru, two from Spain, and one from Iran. This report presents a case of *L. blattarum* human infection in Dubai.

II. CASE PRESENTATION

The patient was a 31-year-old; she had a laparoscopic cholecystectomy in March 2016 and was discharged without complications. She returned to the hospital in May 2016 with complaints of fever, chills, malaise, and vomiting for three days and no recovery by outpatient management. The patient consulted in Emergency, and she had severe respiratory distress, tachypnea, tachycardia, hypotension, and sweating. Spo₂= 80% on rebreathing mask with 10 lit O₂. There was bilateral coarse rales and crackles. Chest X-ray showed an ARDS pattern. Another P/E was not remarkable. The patient was transferred to ICU immediately and intubated after giving 2mg of Midazolam, 100mg of Propofol, 50 mcg of Fentanyl, and 4 mg of Nimbex.

There were copious white-yellowish frothy secretions in the trachea. The patient was kept on SIMV, Vt; 400, Rate 16, Fio₂= 1, Ps= 10, PEEP= 10. The Laboratory test results showed ABG: PH= 7.16, PCO₂= 50.3, PO₂= 78, HCO₃= 18.1 mmol/L, D-dimer= 28.6 mg/L, WBC= 18160 (95.9% neutron), Hb= 12, CRP= 3.8 mg/dL, ESR= 6 mm, Procalcitonin= 11.83 mcg/L. pulmonary CT angiography was normal but showed massive bilateral bronchopneumonia and mild pleural effusion. Antibiotic therapy with meropenem, ceftriaxone, and vancomycin was not effective. Direct microscopic examinations of the bronchial wash showed large numbers of living *L. blattarum* with the irregular movement of flagella (Fig. 1). Papanicolaou staining of bronchial wash smears also showed apparent morphological features of *L. blattarum* under the light microscope (Fig. 2) Chest X-ray showed patchy consolidation in the lateral aspect of right lower zone.

The patient was treated with Metronidazole 500mg for 15 days. Her symptoms were relieved after treatment. Sputum resampling and chest X-ray confirmed the treatment, and she was discharged from ICU one week after admission.

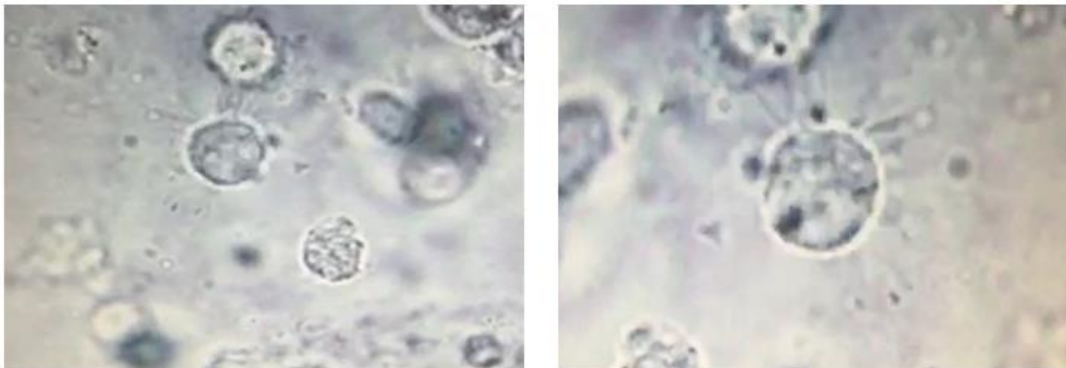


Fig. 1. *Lophomonas blattarum* in direct smear of bronchial wash.

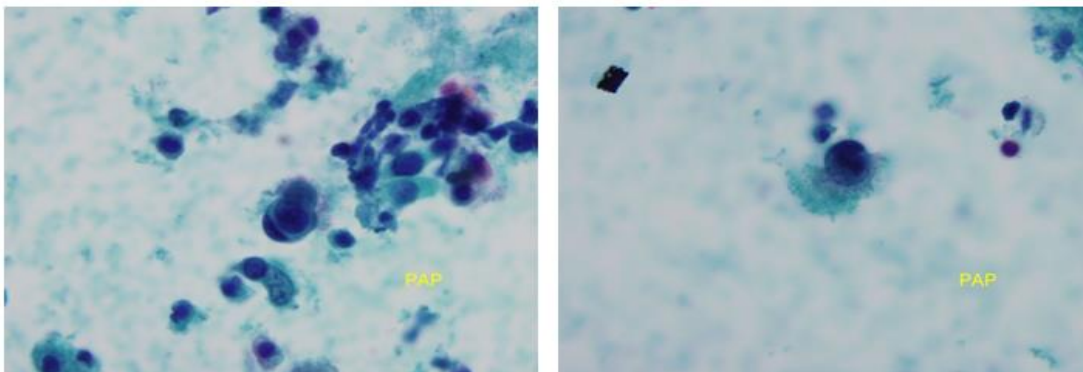


Fig. 2. Papanicolaou staining of bronchial wash.

III. CONCLUSION

Lophomonas blattarum will become a significant pulmonary protozoal infection (Vijayan & Kilani, 2010). This protozoal infection mostly happens in individuals who have compromised immune function. Diagnosis has generally been by light microscopy. However, using features identified under electron microscopy may be worth pursuing (Rafael Martinez-Giro'n1 and Hugo Cornelis van Woerden, 2013). *Lophomonas* is an example of the relation between human disease and insects found in domestic environments. Several papers have proposed that cockroaches act as carriers of essential carriers of human pathogens, including protozoa, such as *Entamoeba histolytica* (Pai et al., 2003; Kinfu & Erko, 2008), *Toxoplasma gondii* (Chinchilla et al., 1994), *Cryptosporidium parvum* and *Balantidium coli* (El-Sherbini & Gneidy, 2012). So it can be concluded that the presence of infected insects in the living area could be associated with an increased risk of inhalation of *Lophomonas* and subsequent human infection. The present case also proved that metronidazole is one of the best antimicrobial choices for treating bronchial *Lophomonas blattarum*-infected patients.

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