

Clostridium Limosum Lung Abscess in a Heart Transplant Recipient: A Rare Case Report

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Abstract

We report a case of *Clostridium limosum* lung abscess in a 71-year-old male heart transplant recipient. The patient presented with a week-long history of productive cough and confusion. His medical history included nonischemic dilated cardiomyopathy, chronic renal disease, and past *Klebsiella pneumoniae* bacteremia, among others. Imaging revealed a thick-walled cavitary lesion in the right lung, initially suspected to be a pulmonary abscess. Lung biopsy culture confirmed the presence of *Clostridium limosum*, a rare pathogen in humans, typically associated with farm animals. Following six weeks of Piperacillin/Tazobactam treatment, the patient showed significant clinical improvement. This case emphasizes the importance of considering zoonotic pathogens in immunosuppressed patients, especially those with occupational exposure.

Keywords: *Clostridium limosum*, Lung abscess, heart transplant, zoonotic infections.

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INTRODUCTION

Clostridium limosum is an anaerobic Gram-positive bacterium, rarely implicated in human infections. It is more commonly associated with farm animals [2-7], making zoonotic transmission a plausible route of infection. Immunocompromised patients, such as organ transplant recipients, are at heightened risk for infections from uncommon pathogens. Lung abscesses in heart transplant recipients, typically result from bacterial, fungal, or mycobacterial infections. However, in this case, *Clostridium limosum* was isolated, representing an unusual etiology of lung abscess in a transplant recipient. Here, we describe a case of a heart transplant patient presenting with a lung abscess caused by this rare pathogen, emphasizing the need for awareness of zoonotic pathogens in immunocompromised individuals.

CASE PRESENTATION

A 71-year-old male with a history of nonischemic dilated cardiomyopathy requiring heart transplantation presented with a one-week history of a productive cough, confusion, and chest pain. His medical history included chronic renal disease, gout, a *Klebsiella pneumoniae* bacteremia with ESBL, obstructive sleep apnea, and crusted Norwegian scabies. He lived on a cattle farm and had close contact with farm animals, including cattle, cats and dogs. He had recently been

treated empirically with meropenem for a fever of unknown origin.

Initial workup revealed right hemithorax abnormalities on CT imaging, with a large thick-walled cavity in the right middle and lower lobes, suggestive of a pulmonary abscess. Bronchoalveolar lavage yielded *Enterococcus raffinosus*, and the patient was initially managed with Piperacillin/Tazobactam. However, due to persistent cavitary lesions, a lung biopsy was performed, which ultimately isolated *Clostridium limosum* from tissue cultures. Given the patient's history of exposure to farm animals, it was suspected that the infection was zoonotic in origin. He completed a six-week course of Piperacillin/Tazobactam, with subsequent imaging showing improvement in the cavitary lesion and resolution of his symptoms.

DISCUSSION

This case highlights a rare instance of *Clostridium limosum* causing a lung abscess in a heart transplant patient. *Clostridium limosum* is an anaerobic pathogen commonly found in farm animals, particularly cattle and sheep [1-7]. While human infections are exceedingly rare, immunocompromised individuals, such as this heart transplant recipient, are particularly susceptible to opportunistic and zoonotic infections.

Clostridium limosum has been associated with infections such as an outbreak of metritis in farmed mink [5]. Human infections are most commonly part of mixed infections [2-4], with a few reports of *C. limosum* isolated from prosthetic valve infections [6], soft tissue infections, and decubitus ulcers [6, 7].

In the context of human infections, only a few cases have been documented in the literature. These include two cases of infected sacral decubitus ulcers [6, 7], and a case of prosthetic valve endocarditis where *C. limosum* was the sole pathogen [6, 7]. In most reported cases, *C. limosum* was part of polymicrobial infections, and patients often had poor outcomes. The patient in this case represents one of the few instances where *C. limosum* was identified as a sole pathogen causing a lung abscess, and this highlights the uniqueness of this presentation.

Clostridium limosum is typically sensitive to a broad range of antibiotics, including penicillin, tetracycline, erythromycin, and chloramphenicol, but it shows resistance to clindamycin [6-8]. This broad antibiotic susceptibility allowed for effective treatment in our patient, who was managed successfully with Piperacillin/Tazobactam.

Lung abscesses in transplant patients typically result from bacterial, fungal, or mycobacterial pathogens. However, in this case, the isolation of *C. limosum* suggests that zoonotic pathogens should also be considered in the differential diagnosis, particularly in patients with relevant environmental exposures.

The patient's lifestyle, living and working on a cattle farm, likely increased his risk of exposure to *C. limosum*, contributing to the development of the lung abscess. The diagnosis was confirmed by tissue biopsy, which allowed for targeted therapy with Piperacillin/Tazobactam, leading to a positive outcome. This case underscores the importance of obtaining a detailed environmental and occupational history in immunocompromised patients presenting with unusual infections.

Furthermore, the case illustrates the diagnostic challenges in immunosuppressed patients, where common pathogens may be ruled out early, and rare infections such as *C. limosum* may only be identified through invasive diagnostic procedures like biopsy.

CONCLUSION

This case of *Clostridium limosum* lung abscess in a heart transplant patient underscores the importance of considering rare and zoonotic pathogens in immunocompromised individuals with environmental exposure. *C. limosum* infections in humans are exceedingly rare, with only a handful of cases reported in the literature, and most of those involved polymicrobial infections. This case is particularly

notable for the isolation of *C. limosum* as the sole pathogen.

The patient's environmental exposure to soil and farm animals likely contributed to the development of this infection. Despite the rarity of *C. limosum*, the bacterium appears to be sensitive to several common antibiotics, making early recognition and appropriate antimicrobial therapy critical for a favorable outcome. The successful treatment of this patient with Piperacillin/Tazobactam reinforces the importance of broad-spectrum antibiotic coverage in the initial management of immunocompromised patients with unusual infections.

This case also contributes to the growing literature on *Clostridium limosum* infections in humans and underscores the need for heightened clinical awareness of zoonotic infections, particularly in immunosuppressed patients with environmental risk factors. Regular follow-up and imaging are crucial to ensure full resolution of the infection, as demonstrated by the patient's improved clinical status and follow-up imaging showing resolution of the cavitory lesion.

Given the rarity of this pathogen in humans, this case contributes to the growing understanding of the clinical significance of *C. limosum* and highlights the importance of thorough diagnostic investigation in transplant patients presenting with unusual infections.

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