



BATTLING A SUPERBUG: A CASE OF ACUTE NECROTIZING PNEUMONIA CAUSED BY ENTEROBACTER CLOACAE

Pulmonary Medicine

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ABSTRACT

We describe a 35-year-old woman who experienced fever and chills for three days, along with coughing up blood, a dry cough, and pain in her right lower chest and back. Imaging revealed a mass with central empty spaces, which was later identified as acute necrotizing pneumonia (ANP) using a CT scan. Testing using bronchoalveolar lavage revealed the presence of *Enterobacter cloacae*, a microorganism that can cause pneumonia. The patient was first treated with Ceftriaxone for two days, but as her condition did not improve, the treatment was changed to Colistin after amplification results indicated a resistant strain of *E. cloacae*. The patient improved with this medication and the mass decreased in size. This case emphasizes the importance of prompt action and appropriate treatment in the recovery of a patient. To the best of our knowledge, there have been only three reported cases of ANP caused by *Enterobacter cloacae*, and this is the first reported case of a female patient.

KEYWORDS

enterobacter cloacae, acute necrotizing pneumonia, Pulmonology, Infectious disease pathology

INTRODUCTION

Enterobacter cloacae is a gram-negative, rod-shaped bacterium commonly found in the environment, such as in soil and water. [1] While it is typically considered a relatively harmless organism, in rare cases, it can cause severe infections, particularly in individuals with weakened immune systems. Acute necrotizing pneumonia is a severe form of pneumonia characterized by the rapid destruction of lung tissue with necrosis and consolidation [2] and can be caused by various pathogens. This case report will describe a case of acute necrotizing pneumonia caused by *Enterobacter cloacae* in a patient with an intact immune system. The report will detail the patient's symptoms, diagnostic findings, and treatment course, as well as discuss the implications of this case for managing and preventing infections caused by this organism.

CASE STUDY

A 35-year-old female patient presented to the clinic with a history of fever and chills, low back and right-sided pain, a dry cough, palpitations, and occasional hemoptysis. A chest x-ray revealed consolidation in the right lower lobe and inhomogeneous opacities with central lucencies. The patient was then sent for a computed tomography (CT) scan, which revealed a sizeable multilobulated mass with central necrosis and air-filled spaces with internal septa [Figure 1]. Based on these findings, a diagnosis of acute necrotizing pneumonia (ANP) was made.

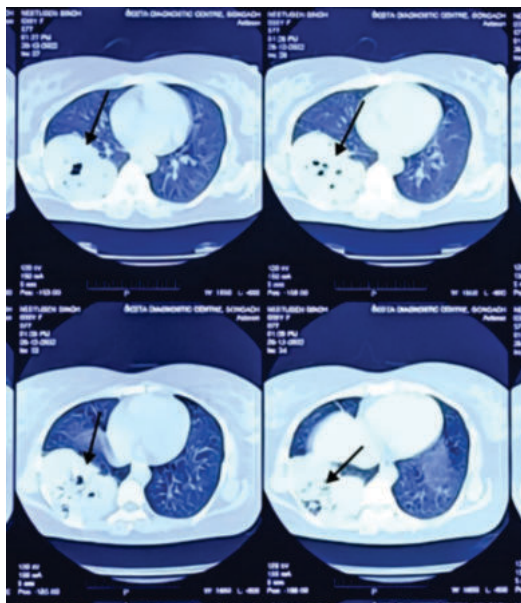


Figure 1: CT Scan At The Level Of Lungs Showing Large

Multilobulated And Smooth Margined Soft Tissue Lesion And Internal Non-enhancing Necrotic Areas With Air Bronchograms (Black Arrow).

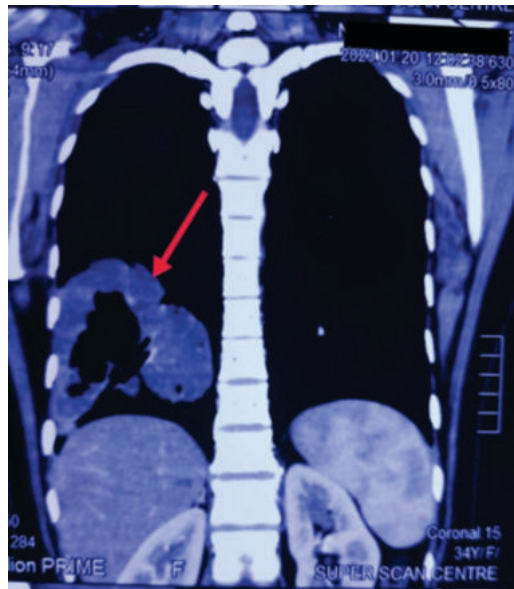


Figure 2: CT Scan Showing Right Lower Lobe Mass With Central Leucencies.

The patient was started on empirical therapy consisting of intravenous antibiotics, including macrolides and fluoroquinolones, while awaiting laboratory results regarding the causative agent. However, no improvement was seen on subsequent CT scans, and a bronchoscopy with bronchoalveolar lavage (BAL) was performed. The BAL samples were sent for Cartridge-based amplification techniques (CBNA) testing, which revealed the presence of *Enterobacter cloacae*, a bacteria that was found to be resistant to Ceftriaxone, imipenem, amikacin, and gentamicin.

This bacterial resistance presented a challenge as the patient's condition deteriorated further. Fosfomycin was initiated for three days, but there was no improvement, and the symptoms worsened with frequent hemoptysis. The patient was admitted to the Intensive care unit (ICU), and the treatment was switched to Colistin to prevent aspiration and dehydration the patient. After 15 days, a repeat CT scan revealed a reduction in the mass size with no air spaces. The treatment continued until the resolution was achieved, and a negative BAL was obtained after 30 days of the therapy's initiation.

DISCUSSION

We conducted a literature search on the PubMed library using the keywords "Acute Necrotizing Pneumonia" and "Enterobacter Cloacae," which yielded six results, of which two were significant. One of the studies presented a case of Acute Necrotizing Pneumonia in a neonate,[3] which was due to a cardiac surgery performed, and the outcome was desirable after the intensive phase of antibiotic therapy. Another in an intensive care unit (ICU) setting [4] noted that their case was complicated by pneumothorax, abscess formation leading to the death of the patient. However, when it comes to Necrotizing Pneumonia, we generally think about *Streptococcus pneumoniae* or Methicillin-resistant *Staphylococcus aureus*. [5] Our patient did not respond to the preferred therapy of Cefazidime due to the organism's resistance to it but showed improvement with Colistin, which may be due to its mechanism of action. It led to survival and prompt recovery.

CONCLUSIONS

Our case highlights that *Enterobacter cloacae* should also be considered a potential causative agent due to its resistance and morbidity if treatment is not appropriately started and even leads to death. Early identification of resistant strains through amplification techniques can aid in reducing mortality and promoting early recovery by guiding in the proper therapeutic direction. This again proves the necessity of tools like CBNAT for detecting and identifying the resistant strains of such notorious bacterial species. To the best of our knowledge, this is the first reported case of a female with no comorbidities having Acute Necrotizing Pneumonia caused by *Enterobacter cloacae*.

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