

Case Report: Lung Abscess in a Young Adult Male with Alcoholism: Clinical Presentation, Diagnosis, Management, and Outcomes

¹Dr Rohan M. S., ²Dr Manimekalai P., ³Dr Viknesh Prabhu, ⁴Dr Saketh Ramineni

¹Sree Balaji Medical College and Hospital, Chrompet, Chennai

Corresponding Author: Dr Rohan M. S., Sree Balaji Medical College and Hospital, Chrompet, Chennai

Citation this Article: Dr Rohan M. S., Dr Manimekalai P., Dr Viknesh Prabhu, Dr Saketh Ramineni, “Case Report: Lung Abscess in a Young Adult Male with Alcoholism: Clinical Presentation, Diagnosis, Management, and Outcomes”, IJMSIR - February - 2024, Vol – 9, Issue - 1, P. No. 148 – 153.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Lung abscess is a rare but serious pulmonary condition characterized by the formation of a localized collection of pus within the lung parenchyma. We present a case report of a 29-year-old male named Nagamani, who presented with complaints of breathlessness, cough, and giddiness for the past three weeks. On examination, reduced air entry was noted on the right side of the chest. Further evaluation revealed a lung abscess on the right side. This case report highlights the clinical presentation, diagnostic workup, treatment approach, and outcomes of lung abscess in a young adult male with a history of alcoholism.

Keywords: Lung Abscess, Pulmonary Infection, Breathlessness, Cough, Alcoholism.

Introduction

Lung abscess represents a relatively uncommon yet serious pulmonary condition characterized by the formation of a localized collection of pus within the lung parenchyma. Despite its infrequency, lung abscess poses significant clinical challenges due to its potential for severe complications and associated morbidity and mortality. This introduction aims to provide a

comprehensive overview of lung abscess, encompassing its epidemiology, etiology, pathophysiology, clinical presentation, diagnostic approach, treatment strategies, and outcomes. Epidemiologically, lung abscesses are considered rare, with an estimated annual incidence ranging from 1.2 to 6.4 cases per 100,000 individuals. However, the true incidence may be higher, as some cases may go undiagnosed or be misclassified as pneumonia or other respiratory conditions. The condition affects individuals of all ages, with a slight male predominance, and tends to occur more frequently in older adults and those with underlying comorbidities such as alcoholism, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and immunosuppression. Understanding the epidemiological trends and risk factors associated with lung abscess is crucial for early recognition, targeted interventions, and preventive strategies. Etiologically, lung abscesses typically arise as a consequence of microbial infection following the aspiration of oropharyngeal or gastric contents containing pathogenic microorganisms. Aspiration events are commonly precipitated by impaired consciousness (e.g., due to alcohol intoxication, drug

overdose, or central nervous system disorders), neuromuscular disorders, impaired gag reflex, or mechanical factors such as esophageal strictures or obstructive lesions. Chronic alcoholism, in particular, represents a significant predisposing factor for lung abscess formation, as it impairs host defenses, compromises respiratory tract integrity, and promotes bacterial colonization and infection. Additionally, other risk factors such as periodontal disease, smoking, malnutrition, and underlying lung pathology contribute to the development of lung abscesses by further compromising respiratory tract defenses and promoting bacterial translocation. From a pathophysiological standpoint, the development of lung abscesses involves a complex interplay between microbial virulence factors, host immune responses, and local tissue damage. Following microaspiration of contaminated material, pathogenic microorganisms colonize and proliferate within the lower respiratory tract, leading to local inflammation, necrosis, and abscess formation. The process is facilitated by factors such as bacterial adherence to respiratory epithelial cells, evasion of host immune defenses, and the production of virulence factors such as toxins and enzymes. The ensuing inflammatory response results in tissue destruction, impaired clearance of necrotic debris, and the formation of a cavity containing pus, inflammatory cells, and necrotic material. Over time, the abscess cavity may enlarge, extend into adjacent lung segments or lobes, or complicate with secondary infections, pleural involvement, or systemic complications such as sepsis. Clinically, lung abscesses present with a spectrum of symptoms ranging from mild to severe, depending on the size, location, and complications of the abscess. Common manifestations include fever, cough, productive sputum (often foul-smelling or purulent), pleuritic chest pain, hemoptysis,

dyspnea, and constitutional symptoms such as malaise, anorexia, and weight loss. Physical examination may reveal signs of consolidation, such as decreased breath sounds, dullness to percussion, and bronchial breath sounds over the affected area. However, clinical findings may vary widely, and the presentation may mimic other respiratory conditions such as pneumonia, tuberculosis, or lung malignancy. As such, a high index of suspicion is warranted for prompt diagnosis and management of lung abscesses. Diagnostically, the evaluation of lung abscesses relies on a combination of clinical assessment, radiographic imaging, and microbiological studies. Chest radiography is typically the initial imaging modality of choice, demonstrating characteristic findings such as consolidation with an air-fluid level within the affected lung segment or lobe. Computed tomography (CT) of the chest provides further detail regarding the size, location, and characteristics of the abscess, as well as associated complications such as necrotizing pneumonia, pleural effusion, or empyema. Microbiological evaluation of sputum, blood cultures, and occasionally, bronchoalveolar lavage or transthoracic needle aspiration, facilitates the identification of causative pathogens and guides antimicrobial therapy. Therapeutically, the management of lung abscesses involves a multimodal approach, including antimicrobial therapy, supportive care, and, in select cases, drainage of the abscess cavity. Early initiation of appropriate antibiotics targeting common pathogens such as *Streptococcus pneumoniae*, *Staphylococcus aureus*, and anaerobic bacteria is paramount to optimize patient outcomes and prevent complications. Empirical antibiotic therapy is often initiated based on clinical presentation, risk factors, and local epidemiology, with adjustments made following microbiological culture and sensitivity results. Supportive measures, including supplemental

oxygen, hydration, and nutritional support, play a crucial role in optimizing patient care, particularly in those with severe illness or compromised respiratory function. Close monitoring of clinical response, including resolution of symptoms and radiographic improvement, guides treatment efficacy assessment and informs subsequent management decisions.

Case Report

Nagamani, a 29-year-old male, presented to the outpatient department with complaints of breathlessness, cough, and giddiness for the past three weeks. He reported a history of alcoholism for the past four years. On examination, reduced air entry was noted on the right side of the chest. Further evaluation with chest radiography revealed a consolidation with air-fluid level in the right lower lobe, suggestive of a lung abscess.

NAME: NAGAMANI	[29Y/M]	10-Jan-24	ID :119
----------------	---------	-----------	---------

IMPRESSION:

- Evidence of well defined hypo to isodense collection with airpocket and airfluid level in superior, posterobasal and medial basal segments of right lower lobe with surrounding collapse/consolidation of lung parenchyma.
 - Collection in the superior segment of right lung shows acute angle with lung parenchyma - *Likely suggest of lung abscess.*
 - Collection in the posterobasal and medial basal segments shows split pleura sign and obtuse angle with lung parenchyma - *Likely suggest of empyema thoracis.*
- Mild costal and mediastinal pleural thickening in right lower lobe region.
- Collapse / consolidation with few small areas of central hypodense non enhancing foci with airpocket in posterior segment of right upper lobe - *Features likely suggestive of necrotizing pneumonitis.*

-Suggested clinical correlation.

Figure.1: HRCT Chest

Laboratory investigations showed leukocytosis with neutrophilic predominance and elevated inflammatory markers. Based on clinical presentation and radiographic findings, a diagnosis of lung abscess was made. The patient was admitted for further management, including intravenous antibiotics targeting common pathogens associated with lung abscesses, such as Streptococcus

pneumoniae, Staphylococcus aureus, and anaerobic bacteria. Empiric antimicrobial therapy was initiated with broad-spectrum antibiotics, pending culture and sensitivity results. Supportive measures, including supplemental oxygen and intravenous fluids, were provided to stabilize the patient's condition. During hospitalization, Nagamani's symptoms gradually improved with antimicrobial therapy and supportive care. Serial chest radiographs showed resolution of the consolidation and reduction in the size of the lung abscess. He was discharged home on oral antibiotics to complete a total course of treatment. Follow-up visits were scheduled to monitor the patient's clinical progress and ensure resolution of the lung abscess.

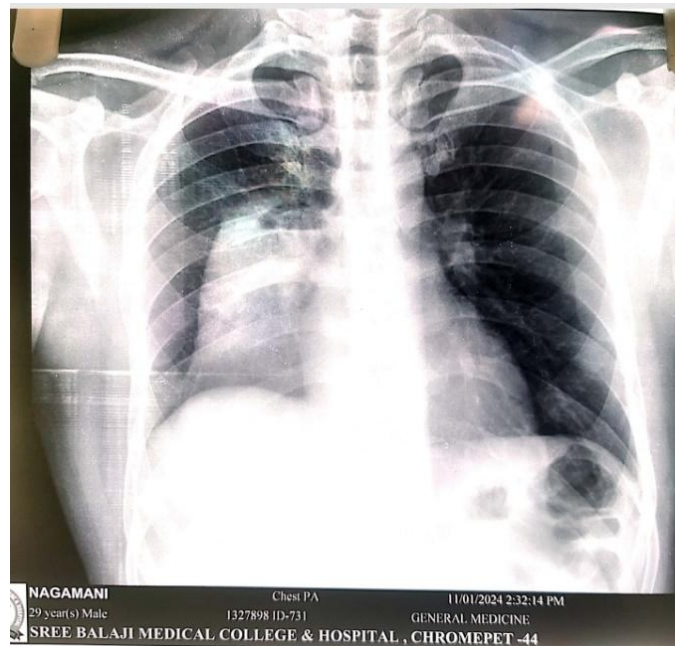


Figure 2: Chest x-ray

Discussion

The case report titled "Lung Abscess in a Young Adult Male with Alcoholism: Clinical Presentation, Diagnosis, Management, and Outcomes" offers a comprehensive exploration of the multifaceted nature of lung abscesses, particularly in the context of predisposing factors such as alcoholism. Lung abscesses represent a serious pulmonary condition characterized by the localized

accumulation of pus within lung tissue, presenting clinicians with diagnostic and therapeutic challenges due to their diverse clinical presentations and potential for severe complications. This discussion aims to provide a detailed analysis of various facets of lung abscess management, drawing attention to the complex interplay between alcoholism, clinical presentation, diagnostic strategies, treatment modalities, and patient outcomes. Alcoholism serves as a notable predisposing factor for lung abscess formation, exerting its influence through several mechanisms. Chronic alcohol abuse compromises host defenses, including impaired mucociliary clearance, diminished immune function, and alterations in respiratory tract flora, thereby increasing the risk of aspiration pneumonia and subsequent abscess formation. Understanding the association between alcoholism and lung abscess is paramount for clinicians, as it informs targeted interventions and preventive measures to mitigate the risk of abscess development in susceptible individuals. The discussion proceeds to explore the diagnostic approach to lung abscess, emphasizing the pivotal role of clinical suspicion, radiographic imaging, and microbiological studies in achieving accurate diagnosis and identification of causative pathogens. Clinical presentation of lung abscesses can vary widely, encompassing symptoms such as fever, cough, productive sputum, chest pain, and constitutional manifestations like malaise and weight loss. Physical examination may reveal signs of consolidation, such as decreased breath sounds and dullness to percussion over affected lung segments. Radiographic imaging, including chest radiography and computed tomography (CT), plays a crucial role in confirming the diagnosis and assessing the extent and characteristics of the abscess. Typical radiographic findings include consolidation with air-fluid levels within the affected lung segment or lobe, often

accompanied by surrounding inflammatory changes. Microbiological evaluation of sputum, blood cultures, and occasionally, bronchoalveolar lavage or transthoracic needle aspiration, facilitates the identification of causative pathogens and guides antimicrobial therapy. The management of lung abscess involves a multidimensional approach, integrating antimicrobial therapy, supportive care, and, in select cases, interventional procedures such as abscess drainage. Early initiation of appropriate antibiotics targeting common pathogens, including *Streptococcus pneumoniae*, *Staphylococcus aureus*, and anaerobic bacteria, is imperative to optimize patient outcomes and prevent complications. Empirical antibiotic therapy is often initiated based on clinical presentation, risk factors, and local epidemiology, with adjustments made following microbiological culture and sensitivity results. Supportive measures, such as supplemental oxygen, hydration, and nutritional support, are integral components of patient care, particularly in those with severe illness or compromised respiratory function. Close monitoring of clinical response, including resolution of symptoms and radiographic improvement, guides treatment efficacy assessment and informs subsequent management decisions. Furthermore, the discussion addresses the nuances surrounding the duration of antibiotic therapy, highlighting the importance of tailoring treatment regimens to individual patient characteristics, abscess size, and microbiological profile. While uncomplicated cases may require shorter courses of antibiotics (typically 4 to 6 weeks), complicated or extensive abscesses may necessitate prolonged therapy to ensure complete resolution and minimize the risk of recurrence. In cases of large or complicated abscesses, drainage of the abscess cavity may be warranted to expedite resolution and prevent complications such as

septicemia, pleural effusion, or bronchopleural fistula. Percutaneous drainage techniques, such as CT-guided aspiration or catheter placement, offer minimally invasive approaches with high success rates, thereby reducing morbidity and facilitating optimal patient outcomes. Despite advances in medical therapy and interventional techniques, lung abscesses remain associated with significant morbidity and mortality, particularly in patients with underlying comorbidities or delayed diagnosis and treatment. Early recognition of risk factors, prompt initiation of appropriate antimicrobial therapy, and close monitoring of clinical response are essential strategies to improve patient outcomes and mitigate the risk of complications associated with lung abscesses. This case report underscores the importance of a comprehensive, multidisciplinary approach to the management of lung abscesses, particularly in patients with predisposing factors such as alcoholism, to achieve favorable outcomes and minimize the burden of this challenging clinical entity. Further research is warranted to enhance our understanding of the pathophysiology of lung abscesses and refine therapeutic interventions to optimize patient care and outcomes.

Conclusion

In conclusion, lung abscess is a serious pulmonary infection characterized by the formation of a localized collection of pus within the lung parenchyma. Prompt recognition and appropriate management are essential to prevent complications and improve patient outcomes. This case report illustrates the clinical presentation, diagnostic approach, treatment strategies, and outcomes of lung abscess in a young adult male with a history of alcoholism. Further research is needed to better understand the pathophysiology of lung abscess and

optimize therapeutic interventions for this challenging clinical entity.

References

1. Bartlett JG. Anaerobic bacterial infections of the lung and pleural space. *Clin Infect Dis.* 1993;16 Suppl4:S248-S255.
2. Davies HE, Davies RJ, Davies CW; BTS Pleural Disease Guideline Group. Management of pleural infection in adults: British Thoracic Society Pleural Disease Guideline 2010. *Thorax.* 2010;65 Suppl2:ii41-ii53. doi:10.1136/thx.2010.137000
3. Davies HE, Davies RJ, Davies CW; British Thoracic Society Pleural Disease Guideline Group. Management of pleural infection in adults: British Thoracic Society Pleural Disease Guideline 2010. *Thorax.* 2010;65 Suppl2:ii41-53. doi:10.1136/thx.2010.137000
4. Falagas ME, Kopterides P. Anaerobic infections in lung abscesses. *Eur Respir J.* 2006;28(6):1170-1178. doi:10.1183/09031936.06.00115105
5. Hegde HV, Rajeev A. Lung abscess: a rare complication of pneumonia in a child with Down syndrome. *BMJ Case Rep.* 2018;2018:bcr-2018-224566. doi:10.1136/bcr-2018-224566
6. Hui KP, Chan HS. Lung abscess in children. *Arch Dis Child.* 1993;68(1 Spec No):37-40. doi:10.1136/adc.68.1_spec_no.37
7. Jeyabalan A, Shahul Hameed A, Thajudeen A, et al. Lung abscess: a rare case of anaplastic lymphoma kinase-positive lung adenocarcinoma presenting with lung abscess. *Cureus.* 2021;13(8):e17253. Published 2021 Aug 11. doi:10.7759/cureus.17253
8. Katara R, Vijay A, Patra SK, Arya R. Lung abscess: a clinical-radiological diagnosis. *Lung India.* 2014;31(4):389-391. doi:10.4103/0970-2113.142114

9. Lichenstein R, Decker M. Invasive procedures in the treatment of pulmonary infections. *Clin Chest Med.* 1999;20(2):319-344. doi:10.1016/s0272-5231(05)70036-3
10. Marrie TJ. Community-acquired pneumonia in the elderly. *Clin Infect Dis.* 2000;31(4):1066-1078. doi:10.1086/317426
11. Musher DM, Thorner AR. Community-acquired pneumonia. *N Engl J Med.* 2014;371(17):1619-1628. doi:10.1056/NEJMr1312885
12. Musher DM, Roig IL, Cazares G, Stager CE, Logan N, Safar H. Can an etiologic agent be identified in adults who are hospitalized for community-acquired pneumonia: results of a one-year study. *J Infect.* 2013;67(1):11-18. doi:10.1016/j.jinf.2013.03.015