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Case Journal "Bronchopneumonia In Adult Patients"

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Abstract

Bronchopneumonia is a lower respiratory tract infection characterized by inflammation of the bronchioles and alveoli caused by microbial infection. It remains a significant cause of morbidity and mortality, particularly among older adults and individuals with underlying risk factors. This case journal aimed to describe the clinical manifestations, diagnostic approach, and management of bronchopneumonia in an adult patient. A case report method was employed using data obtained from medical records, including history taking, physical examination, laboratory investigations, radiological findings, and therapeutic evaluation during hospitalization. A 58-year-old male presented with shortness of breath, productive cough with yellowish sputum, fever, and chest pain during coughing. Physical examination revealed tachypnea, coarse crackles, increased tactile fremitus, and dullness to percussion over the right lower lung field. Laboratory investigations demonstrated leukocytosis and elevated C-reactive protein levels, while chest radiography showed multiple patchy infiltrates in both lower lung fields. The patient was diagnosed with bronchopneumonia and treated with antibiotics, oxygen supplementation, mucolytic therapy, and supportive management. Accurate diagnosis and appropriate management contributed to clinical improvement and reduced the risk of complications associated with bronchopneumonia.

Keywords: ***Bronchopneumonia, Pneumonia, Lower Respiratory Tract Infection, Diagnosis, Treatment***

INTRODUCTION

Bronchopneumonia is a form of pneumonia characterized by inflammation of the terminal bronchioles and surrounding alveoli, with multifocal or patchy lesions distributed throughout the lung parenchyma. The disease may be caused by various microorganisms, including bacteria, viruses, and fungi, and commonly presents with clinical manifestations such as fever, productive cough, dyspnea, chest pain, and impaired gas exchange leading to hypoxemia. Bronchopneumonia remains a global health concern due to its high morbidity and mortality rates, particularly among older adults, patients with chronic diseases, and individuals with compromised immune systems (Jain et al., 2023).

Pneumonia continues to be one of the leading causes of hospitalization and death from lower respiratory tract infections worldwide. Global reports indicate that lower respiratory tract infections remain a significant cause of mortality, accounting for millions of cases and deaths each year. The burden of this disease is particularly high among the elderly population due to age-related immune decline, increased comorbidities, and a greater risk of complications such as respiratory failure, sepsis, and cardiovascular disorders (Anderson, 2023).

In Indonesia, pneumonia remains a major public health problem. Data from the National Basic Health Research (Riskesdas) have shown an increase in pneumonia prevalence from 1.8% to approximately 2% over recent years. Furthermore, pneumonia is one of the most common causes of hospitalization and is associated with a relatively high mortality rate, especially among older adults and patients with underlying comorbidities. These findings indicate that pneumonia, including bronchopneumonia, continues to require serious attention regarding prevention, early diagnosis, and appropriate management (Fachri et al., 2025).

Pathophysiologically, bronchopneumonia occurs when microorganisms invade the lower respiratory tract and trigger an inflammatory response within the bronchioles and alveoli. This inflammatory process leads to the accumulation of exudates, edema, and infiltration of inflammatory cells, resulting in impaired ventilation and gas exchange. Clinical manifestations vary depending on the extent of lung involvement, the causative pathogen, the patient's age, and accompanying comorbid

conditions. Therefore, early identification of risk factors and prompt diagnosis are essential to prevent complications that may worsen the patient's prognosis (Jain et al., 2023).

The management of bronchopneumonia includes supportive therapy and empiric antibiotic treatment tailored to the patient's clinical condition and the likely causative organisms. The 2023 Indonesian National Clinical Practice Guidelines (PNPK) for Adult Pneumonia emphasize the importance of accurate diagnosis, assessment of disease severity, and appropriate therapeutic interventions to reduce morbidity and mortality. Comprehensive clinical evaluation through history taking, physical examination, laboratory investigations, and radiological assessment serves as the foundation for establishing the diagnosis and determining optimal management strategies (PNPK, 2023).

The bronchopneumonia case presented in this case journal is expected to provide an overview of the clinical manifestations, diagnostic approach, and management of bronchopneumonia based on current evidence and clinical guidelines, thereby enhancing clinical understanding and improving the management of this disease.

RESEARCH METHODS

This study employed a descriptive case report design aimed at presenting the clinical characteristics, diagnostic approach, management, and outcomes of an adult patient diagnosed with bronchopneumonia. The subject of this case report was a 58-year-old male patient admitted to the Emergency Department on January 10, 2026, with respiratory complaints suggestive of lower respiratory tract infection.

Data were collected retrospectively from the patient's medical records, including history taking, physical examination findings, laboratory investigations, radiological examinations, diagnosis, treatment, and clinical progress during hospitalization. Clinical assessment was conducted through comprehensive anamnesis, vital sign evaluation, respiratory system examination, laboratory testing, and chest radiography.

The diagnosis of bronchopneumonia was established based on the patient's clinical manifestations, physical examination findings, laboratory results indicating infection and inflammation, and radiographic evidence of multiple patchy infiltrates in both lower lung fields. The management provided was evaluated according to current clinical practice guidelines and evidence-based recommendations for adult pneumonia treatment.

The collected data were analyzed descriptively and presented in narrative and tabular forms to provide a comprehensive overview of the patient's clinical presentation, diagnostic findings, therapeutic interventions, and their relevance to the current literature on bronchopneumonia.

RESULTS AND DISCUSSION

Results

Mr. A, a 58-year-old male, presented to the Emergency Department on January 10, 2026, with a chief complaint of shortness of breath that had been experienced for four days prior to hospital admission and had progressively worsened during the last day. The complaint was accompanied by a productive cough with yellowish sputum that was difficult to expectorate, intermittent fever predominantly at night, chills, generalized weakness, decreased appetite, and chest pain during coughing. The patient reported experiencing flu-like symptoms and cough approximately one week before the worsening of his condition. His past medical history revealed hypertension, with no history of diabetes mellitus, asthma, or tuberculosis. The patient had a smoking history of approximately 25 years with an average consumption of one pack per day.

Table 1. Patient Characteristics

Characteristics	Description
Patient Initials	Mr. A
Age	58 years
Gender	Male
Occupation	Entrepreneur
Chief Complaint	Shortness of breath
History of Hypertension	(+)
History of Diabetes Mellitus	(-)
History of Tuberculosis	(-)
History of Asthma	(-)
Smoking History	±25 years (1 pack/day)

Physical examination revealed that the patient was conscious and fully oriented (compos mentis), with vital signs suggestive of an acute infectious process accompanied by respiratory impairment. Increased respiratory rate, fever, and decreased oxygen saturation without oxygen supplementation were observed.

Table 2. Physical Examination Findings

Parameter	Result
Level of Consciousness	Compos mentis
Blood Pressure	130/80 mmHg
Pulse Rate	104 beats/minute
Respiratory Rate	28 breaths/minute
Body Temperature	38.5°C
SpO_2	92% on room air

Respiratory system examination demonstrated signs of pulmonary consolidation, including increased tactile fremitus, dullness to percussion, and coarse crackles, indicating an infectious process involving the pulmonary parenchyma.

Table 3. Respiratory Examination Findings

Examination	Findings
Inspection	Symmetrical chest movement, use of accessory respiratory muscles (+)
Palpation	Increased tactile fremitus in the right lower lung field
Percussion	Dullness over the right lower lung region
Auscultation	Coarse crackles (+), bronchial breath sounds in the right lower lung field

Laboratory investigations demonstrated leukocytosis and elevated C-reactive protein (CRP), indicating an inflammatory response due to acute infection. Chest radiography revealed multiple patchy infiltrates in both lower lung fields, consistent with the radiographic appearance of bronchopneumonia.

Table 4. Supporting Examination Results

Examination	Result	Normal Value
Hemoglobin (Hb)	12.8 g/dL	13–17 g/dL
Leukocytes	16,500/mm^3	4,000–10,000/mm^3
Platelets	310,000/mm^3	150,000–450,000/mm^3
CRP	Elevated	<10 mg/L
Chest X-ray	Multiple patchy infiltrates in the right and left lower lung fields	-

Based on the history taking, physical examination, laboratory findings, and radiological results, the patient was diagnosed with bronchopneumonia. Differential diagnoses included community-acquired pneumonia, pulmonary tuberculosis, and acute exacerbation of chronic obstructive pulmonary disease (COPD) with infection. The management provided consisted of both non-pharmacological and pharmacological interventions, as shown in Table 5.

Table 5. Patient Management

Type of Therapy	Management
Non-Pharmacological	Bed rest
	Vital sign monitoring
	Oxygen saturation monitoring
	Adequate nutritional support
	Smoking cessation education
Pharmacological	Oxygen via nasal cannula at 3 L/minute
	Ceftriaxone 1 g IV every 12 hours
	Azithromycin 500 mg/day
	Paracetamol 500 mg as needed for fever
	N-acetylcysteine 200 mg three times daily

Discussion

Bronchopneumonia is an acute inflammation of the terminal bronchioles and surrounding alveoli characterized by a multifocal or patchy distribution pattern within the lung parenchyma. This condition is commonly caused by bacterial pathogens such as *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Staphylococcus aureus*. In this case, the diagnosis of bronchopneumonia was established based on the combination of clinical manifestations, physical examination findings, laboratory investigations, and characteristic radiological features.

The patient presented with the typical symptoms of bronchopneumonia, including shortness of breath, productive cough with yellowish sputum, fever, and pleuritic chest pain. These symptoms represent classic manifestations of bronchopneumonia resulting from the inflammatory process occurring in the lower respiratory tract and alveoli. The invasion of microorganisms into the lungs triggers activation of the immune system, leading to neutrophil infiltration, increased mucus production, and accumulation of inflammatory exudate within the alveolar spaces. Consequently, ventilation and gas exchange are impaired, resulting in dyspnea and reduced oxygen saturation.

Physical examination demonstrated a respiratory rate of 28 breaths per minute, a body temperature of 38.5°C, and oxygen saturation of 92% without supplemental oxygen. These findings indicate the presence of acute infection accompanied by impaired oxygenation. The use of accessory respiratory muscles suggests increased work of breathing due to decreased pulmonary efficiency in gas exchange.

Furthermore, increased tactile fremitus, dullness to percussion, coarse crackles, and bronchial breath sounds were identified in the right lower lung field. These findings are indicative of pulmonary consolidation caused by the accumulation of inflammatory exudates within the alveoli. Increased tactile fremitus occurs because sound vibrations are transmitted more effectively through consolidated lung tissue than through normal air-filled lung parenchyma. Coarse crackles reflect the presence of secretions within the airways, while dullness to percussion signifies increased tissue density resulting from inflammatory infiltration.

Laboratory investigations revealed leukocytosis of 16,500/mm^3 and elevated CRP levels, supporting the presence of acute bacterial infection. Leukocytosis represents the body's immune response to infection, whereas elevated CRP levels indicate active systemic inflammation. Radiological examination demonstrated multiple patchy infiltrates in the right and left lower lung fields, which are characteristic findings of bronchopneumonia.

Table 6. Correlation Between Clinical Findings and the Diagnosis of Bronchopneumonia

Clinical Finding	Interpretation
Fever (38.5°C)	Indicates acute infection
Productive cough with yellow sputum	Suggestive of bacterial infection
Shortness of breath	Impaired ventilation and gas exchange
SpO_2 92%	Mild hypoxemia
Leukocyte count 16,500/mm^3	Infection-related leukocytosis
Elevated CRP	Systemic inflammatory response
Coarse crackles	Presence of airway secretions
Increased tactile fremitus	Pulmonary consolidation
Dullness to percussion	Pulmonary tissue infiltration
Multiple infiltrates on chest radiograph	Typical radiographic appearance of bronchopneumonia

The patient's 25-year smoking history represents a significant risk factor in this case. Long-term exposure to cigarette smoke can damage the mucociliary defense mechanisms of the respiratory tract, thereby facilitating microbial colonization and invasion. In addition, the patient's age, approaching the elderly population, further increases the risk of lower respiratory tract infections due to age-related decline in immune system function.

The management administered included a combination of ceftriaxone and azithromycin as empirical antibiotic therapy. This combination is widely recommended for hospitalized patients with community-acquired pneumonia because it provides coverage against both typical and atypical bacterial pathogens. Supplemental oxygen delivered through a nasal cannula was administered to improve tissue oxygenation, while N-acetylcysteine was prescribed to facilitate sputum clearance. Supportive measures, including bed rest, close monitoring of vital signs, and adequate nutritional intake, also played an important role in promoting recovery.

Overall, this case demonstrates the characteristic clinical presentation of bronchopneumonia, with advanced age and a long history of smoking identified as major risk factors. Early diagnosis through comprehensive history taking, physical examination, laboratory testing, and radiological assessment enabled timely and appropriate treatment. Consequently, the patient's prognosis is expected to be favorable, while the risk of complications such as pleural effusion, lung abscess, respiratory failure, and sepsis can be minimized.

CONCLUSIONS

Bronchopneumonia is a lower respiratory tract infection characterized by inflammation of the bronchioles and surrounding lung parenchyma caused by microbial infection, particularly bacterial pathogens. This condition remains an important public health concern because it can lead to significant respiratory impairment and increase morbidity and mortality, especially among older adults, patients with underlying comorbidities, and individuals with weakened immune systems.

In this case, the diagnosis of bronchopneumonia was established based on a combination of history taking, physical examination, and supporting investigations. The patient presented with typical clinical manifestations, including fever, productive cough, shortness of breath, and a decline in general condition. Physical examination revealed pulmonary crackles suggestive of a lower respiratory tract infection, while laboratory findings demonstrated leukocytosis indicative of an infectious process. Chest radiography showing patchy infiltrates in the lung fields further supported the diagnosis of bronchopneumonia.

The management of bronchopneumonia requires a comprehensive approach, including appropriate antibiotic therapy, supportive treatment such as oxygen supplementation when indicated, fever control, adequate fluid and nutritional support, and continuous monitoring of the patient’s clinical condition. Early and appropriate intervention is essential to accelerate recovery, prevent complications, and improve patient outcomes.

Based on the clinical evaluation, the patient demonstrated improvement following the administration of appropriate therapy. This finding highlights the importance of accurate diagnosis and adequate management in achieving successful treatment outcomes for bronchopneumonia. Therefore, healthcare professionals should be capable of recognizing clinical manifestations, establishing a timely diagnosis, and providing evidence-based treatment according to current guidelines in order to minimize complications and mortality associated with this disease.

Overall, this case illustrates that bronchopneumonia is a serious condition requiring prompt attention, as it may progress to more severe complications if not managed appropriately. A thorough understanding of its risk factors, clinical manifestations, diagnostic methods, and treatment strategies is essential to optimize patient care, improve clinical outcomes, and enhance the quality of healthcare services.

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