

CASE REPORT

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A rare and potentially fatal complication of measles in a postpartum women: navigating the dangers of a vaccine-preventable disease

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Abstract

Measles is a highly contagious viral illness that can lead to severe complications, especially in unvaccinated individuals. While the acute phase of the disease is well-characterized, the potential for delayed and life-threatening complications, even during the convalescent phase, is less widely recognized. Here, we present the case of a previously healthy 18-year-old female who developed tension pneumothorax and extensive lung injury approximately 6 weeks after the onset of a measles infection. The patient was initially presented with dyspnea, chest pain, and respiratory distress. Diagnostic imaging confirmed the presence of tension pneumothorax and diffuse lung parenchymal injury. The patient underwent urgent chest tube insertion and supportive management, with gradual improvement in their respiratory status over the following weeks. Standard treatment for measles includes supportive therapy with hydration, antipyretics, and high-dose vitamin A to reduce complications. Antibiotics and respiratory support are required for secondary bacterial infections or severe pneumonia. This patient required oxygen therapy, antibiotics, and chest tube insertion due to pneumothorax. This rare but life-threatening complication of measles underscores the importance of vaccination and vigilant monitoring of measles patients, even during the convalescent phase of illness.

Keywords Measles, Spontaneous pneumothorax, Lung consolidation, Postpartum, Vaccination

Introduction

Measles is a highly contagious acute viral illness characterized by a distinctive exanthem, pathognomonic exanthem (Koplik spots), and the classical triad of cough, coryza, and conjunctivitis [1]. Despite widespread vaccination efforts, measles remains a significant public health concern in areas with low immunization coverage. The most common complications contributing to measles-related morbidity and mortality include

bronchopneumonia, otitis media, diarrhea, croup, and encephalitis [2].

Rarely, measles can be associated with complications such as pneumothorax and pulmonary embolism [3, 4]. Even more uncommon is the development of spontaneous pneumothorax and acute lung injury as delayed manifestations of measles infection during the convalescent phase.

We report a rare case of a previously healthy postpartum woman who developed bilateral tension pneumothorax and acute lung injury several weeks after the initial onset of measles infection, highlighting the potential for severe and unexpected complications in the post-measles recovery period.

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Case presentation

A previously healthy 18-year-old female presented to the emergency department with acute onset of dyspnea, chest pain, and respiratory distress approximately 6 weeks after the onset of a measles infection. She was postpartum day 40 at the time of presentation. Upon arrival, her vital signs were as follows: respiratory rate, 56 breaths per minute; oxygen saturation, 79 percent on a mask without rebreather (15 l oxygen); trachea, central; air intake, poor on both sides; heart rate, 170 beats per minute; and blood pressure, 95/68 mmHg. These factors, together with imaging results, contributed to the diagnosis of pneumothorax.

The patient had no significant past medical history and was unvaccinated against measles. Her initial measles infection had been managed conservatively, and she had been recovering well at home over the following weeks. However, 6 weeks after the onset of measles symptoms, she experienced a sudden and severe worsening of dyspnea, chest pain, and tachypnea.

On physical examination, she appeared acutely ill, with diminished breath sounds bilaterally, tachycardia, and an oxygen saturation of 88% on room air.

Urgent chest radiography revealed a right-sided tension pneumothorax with significant lung parenchymal changes suggestive of contusion or injury (Fig. 1). A right-sided chest tube was promptly inserted, resulting in partial symptom relief. A subsequent computed tomography (CT) scan of the chest confirmed the right-sided tension pneumothorax, a minimal left-sided pneumothorax, and diffuse ground-glass opacities with consolidation across both lung fields, findings consistent with acute lung injury (Fig. 2).

The patient was advised to be admitted to the intensive care unit (ICU) for close monitoring and

supportive care. However, her family refused hospitalization, and she was discharged against medical advice.

Forty-eight hours later, the patient returned to the hospital after being turned away from other facilities. A repeat chest radiograph revealed resolution of the right-sided pneumothorax but showed a new left-sided tension pneumothorax (Fig. 3A). The patient was immediately treated with a left-sided chest tube thoracostomy to evacuate the tension pneumothorax (Fig. 3B).

Following the procedure, she was admitted to the ICU for close monitoring and supportive care, including supplemental oxygen, intravenous fluids, and empiric antibiotics to address potential secondary infections.

Over the following days, the patient's respiratory status gradually improved. Serial imaging, including chest X-rays and CT scans, demonstrated resolution of the pneumothoraces and regression of lung parenchymal changes. Both chest tubes were successfully removed (Fig. 4).

The patient was weaned off supplemental oxygen and discharged home in stable condition after 2 weeks of inpatient care. At a follow-up visit 4 weeks after discharge, she had made a full recovery, with no residual respiratory symptoms or radiographic abnormalities.

This case highlights a rare but severe complication of measles during the convalescent phase. It underscores the importance of vaccination and the need for vigilant monitoring of measles patients to promptly identify and manage potential delayed complications.

Discussion

Although typically mild and self-limiting, measles-associated immunodeficiency can predispose patients to severe complications, including bronchopneumonia, croup, pneumothorax, pulmonary embolism, and even death [1, 4]. Serious complications are uncommon but occur more

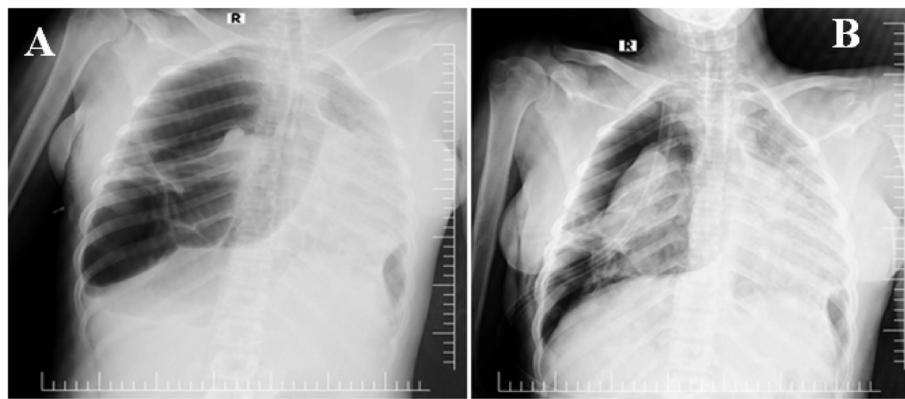


Fig. 1 Posterior-anterior chest X-ray shows tension pneumothorax on the right side with left-side consolidation and mediastinal shifting (A). Chest X-ray after chest tube insertion. There is expansion on the right lung (B)

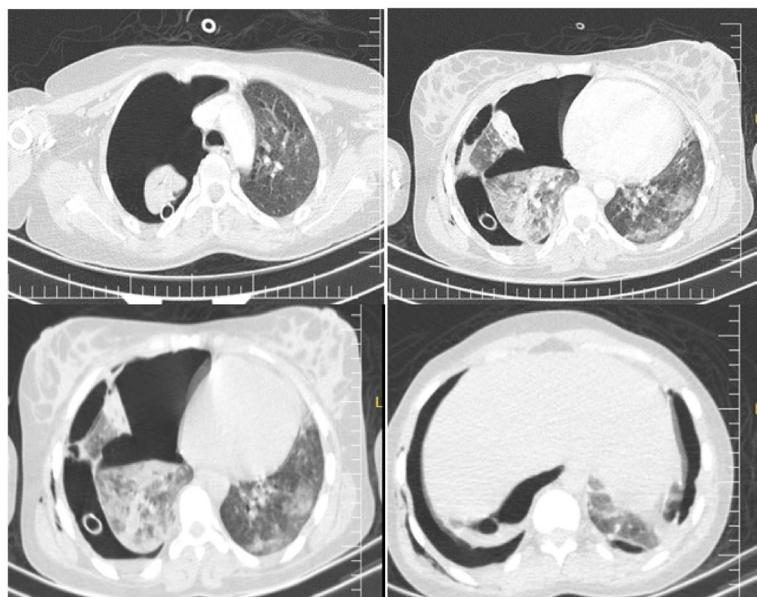


Fig. 2 Computer tomography (CT) scan of the chest shows tension pneumothorax on the right and a minimum pneumothorax on the left, as well as diffuse ground-glass opacities and consolidation throughout both lung fields



Fig. 3 **A** Portable chest radiograph demonstrating a left-sided tension pneumothorax, with chest tube and consolidation on the right lung. There is chest tube and lung contusion on the right side. **B** Chest X-ray after chest tube insertion. There are complete resolution of the pneumothorax, and both lungs are fully expanded

frequently in vulnerable populations such as children under 5 years old, adults over 20, pregnant women, and individuals with conditions like immune deficiency disorders, malnutrition, or vitamin A deficiency. Lack of prior measles vaccination and intense exposure to the virus further increase the risk [4].

Primary spontaneous pneumothorax is a known clinical entity with distinct risk factors, including male sex, tall stature, smoking, and genetic predispositions such as FLCN gene mutations or conditions like alpha-1 antitrypsin deficiency, cystic fibrosis, vascular Ehlers-Danlos syndrome, Marfan syndrome, tuberous sclerosis,

Loeys-Dietz syndrome, and homocystinuria [5]. However, the occurrence of bilateral tension pneumothorax in the context of a recent measles infection, as observed in this case, represents an exceedingly rare and life-threatening complication.

The patient, a postpartum woman, developed bilateral tension pneumothorax and acute lung injury following measles infection. Her clinical presentation highlights an uncommon but severe complication of the disease. Similar to this case, Mastroianni et al. described a 19 years old with measles who developed pneumothorax, pneumomediastinum, pneumopericardium, and



Fig. 4 After the removal of chest tubes, a follow-up chest X-ray (**A**) and computed tomography (CT) scan (**B**) have shown normal findings

subcutaneous emphysema, emphasizing the potential for extensive pulmonary complications [3]. The development of bilateral pneumothorax and acute lung injury in the context of a recent measles infection is a rare but life-threatening complication [6, 7].

The pathophysiology underlying pneumothorax and lung injury in measles patients is not fully elucidated. One hypothesis suggests that the measles virus may cause direct damage to the lung parenchyma, leading to alveolar rupture and subsequent pneumothorax formation.

The measles virus (MeV) primarily affects the respiratory epithelium, leading to direct cytopathic effects, immune-mediated lung injury, and increased susceptibility to secondary bacterial infections. Viral pneumonitis results in alveolar epithelial damage, diffuse alveolar damage (DAD), and inflammation, predisposing to alveolar rupture. Persistent cough and increased intrathoracic pressure further contribute to barotrauma, increasing the risk of pneumothorax. Additionally, postinfectious bronchiolitis obliterans and emphysema-like changes may lead to subpleural bleb formation, which can rupture spontaneously. Measles-induced immune suppression and superimposed bacterial pneumonia exacerbate lung injury, making pneumothorax a potential complication. The timing of these complications occurring weeks after the acute phase (initial phase) indicates the importance of careful monitoring during the convalescent phase of measles.

This case underscores the need for healthcare providers to maintain a high index of suspicion for delayed, severe complications of measles, particularly in unvaccinated individuals or those with known risk factors for severe disease. Prompt recognition and management of these complications are critical to reducing morbidity and preventing mortality.

Conclusion

This case underscores the potential for rare but severe complications of measles, even in otherwise healthy individuals without significant comorbidities. It highlights the critical importance of measles vaccination in preventing such complications and stresses the need for vigilant follow-up during the convalescent phase, as life-threatening events can occur unexpectedly. Early recognition and timely intervention, as demonstrated in this case, are essential for ensuring favorable patient outcomes.

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Not applicable.

Authors' contributions

Authors' statement Abdullahi ahmed ahmed: Conceived, design, analyzed, wrote the first draft, revised and approved the final draft. Ismail mohamoud abdullahi: Analyzed, wrote the first draft, revised and approved the final draft. Abdikani ali salad: Conceived, design, analyzed, and approved the final draft.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

Based on the regulations of the review board of the Mogadishu Somali Turkish Training and Research Hospital, institutional review board approval is not required for case reports.

Consent for publication

Written informed consent had been obtained by the patient to have the case details and any accompanying images published.

Competing interests

The authors declare no competing interests.

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