

Spontaneous Pneumothorax in a Term Neonate: A Case Report.

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Abstract

Spontaneous pneumothorax in neonates, although rare, presents a significant clinical challenge. This report discusses the case of a 3-day-old female neonate who developed sudden respiratory distress due to a left-sided pneumothorax. Born at 39 weeks gestation via spontaneous vaginal delivery, the neonate initially appeared healthy. However, she soon presented with tachypnoea, nasal flaring, and intermittent grunting. Physical examination revealed decreased breath sounds on the left side and asymmetrical chest expansion. A chest X-ray confirmed a left-sided pneumothorax with substantial lung collapse. Laboratory investigations showed mild respiratory acidosis, but were otherwise unremarkable. Immediate intervention involved needle aspiration and chest tube insertion, resulting in rapid improvement of the neonate's respiratory status. The chest tube was successfully removed after 48 hours with no re-accumulation of air observed. The patient was discharged in stable condition on day 7. This case highlights the importance of prompt recognition and intervention in neonatal pneumothorax to ensure favourable outcomes. Similar cases in literature support the efficacy of early imaging and minimally invasive procedures in managing this condition. Clinicians should maintain a high index of suspicion for pneumothorax in neonates presenting with acute respiratory distress.

Keywords:- Spontaneous Pneumothorax, Respiratory distress, X-Ray, Outcome.

INTRODUCTION

Spontaneous pneumothorax refers to the presence of air within the pleural cavity without any apparent cause, such as trauma or medical intervention. While it is more commonly encountered in adults, particularly those with underlying lung disease or a history of smoking, spontaneous pneumothorax can also occur in neonates. The incidence of neonatal pneumothorax is approximately 1-2% in live births, but the rate is higher in premature infants and those with underlying respiratory distress.

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The pathophysiology of neonatal pneumothorax often involves the rupture of alveoli due to increased intra-alveolar pressure, which can be precipitated by various factors including mechanical ventilation, underlying lung pathology like respiratory distress syndrome (RDS), or even vigorous crying. In full-term neonates, spontaneous pneumothorax may be idiopathic or associated with transient tachypnoea of the newborn (TTN) or meconium aspiration syndrome (MAS). The resultant air leak leads to the accumulation of air in the pleural space, impairing ventilation and oxygenation.

Clinically, neonates with pneumothorax may present with sudden onset respiratory distress, characterized by tachypnoea, grunting, nasal flaring, and cyanosis. The physical examination may reveal decreased breath sounds on the affected side, asymmetrical chest expansion, and, in severe cases, tracheal deviation. Diagnosis is confirmed through imaging, with chest radiography being the standard modality, revealing the presence of air in the pleural space and, in some instances, lung collapse.

An important finding in cases of neonatal pneumothorax is the potential for rapid deterioration, necessitating urgent intervention. While some cases may resolve spontaneously, others require needle aspiration or chest tube placement to evacuate the air and allow for lung re-expansion. Understanding the nuances of neonatal pneumothorax, including its varied presentation and management options, is crucial for improving outcomes in this vulnerable population.

CASE REPORT

A 3-day-old female neonate, born at 39 weeks of gestation via spontaneous vaginal delivery, presented with sudden onset of respiratory distress. She was previously healthy with an uneventful birth history and a normal Apgar score. At the time of presentation, the neonate exhibited signs of respiratory distress, including tachypnoea, nasal flaring, and intermittent grunting.

Initial physical examination revealed decreased breath sounds on the left side of the chest and asymmetrical chest expansion. Vital signs showed a respiratory rate of 70 breaths per minute, heart rate of 160 beats per minute, and oxygen saturation of 85% on room air. The infant was promptly placed on supplemental oxygen, and a chest X-ray

was obtained, which confirmed the diagnosis of a left-sided pneumothorax with significant lung collapse.

Laboratory investigations, including a complete blood count and arterial blood gas analysis, were within normal limits except for mild respiratory acidosis (pH 7.30, pCO₂ 55 mmHg, pO₂ 60 mmHg). Due to the significant size of the pneumothorax and the neonate's respiratory compromise, a decision was made to perform needle aspiration followed by the insertion of a chest tube. The procedure was carried out under sterile conditions, and a size 10 French chest tube was inserted into the left pleural space, resulting in immediate improvement in respiratory status.

Following chest tube placement, the neonate's oxygen saturation improved to 95% on supplemental oxygen, and repeat chest X-ray confirmed re-expansion of the left lung. The chest tube was left in place for 48 hours and then removed after confirming no re-accumulation of air on follow-up imaging. The patient was monitored in the neonatal intensive care unit (NICU) and discharged on day 7 of life with stable vital signs and normal respiratory function.



Figure 1: X-Ray Showing a clear absence of lung markings on the left side, with a distinct visceral pleural line indicating the collapsed lung. The left hemithorax appears more radiolucent compared to the right. Additionally, there is a slight mediastinal shift towards the right side, suggesting a significant pneumothorax.

In view of progressive pneumonitis changes intravenous antibiotics were escalated to ceftriaxone (MONOCEF) and vancomycin. A diagnostic pleural tap performed on the 20th of May revealed a sterile effusion with AFB negative for TB NAAT, thus excluding tuberculosis. Consequently, the patient was continued on antibiotic therapy, received supportive care, and nutritional rehabilitation was initiated.

Over the following days, the patient's respiratory distress gradually improved with back-to-back nebulisations. His fever subsided, and his pedal edema resolved. SAM supplements were introduced to address his nutritional deficiencies, and his oral intake progressively improved.

Serial CXR assessments confirmed the resolution of the pleural effusion, and the patient's clinical condition stabilized. Chest physiotherapy was taught to the parents to support ongoing respiratory improvement. The patient was discharged in a stable condition, afebrile, with no respiratory distress, and demonstrating good oral intake. He was discharged with dietary advice and follow-up recommendations for continued nutritional rehabilitation and monitoring.

DISCUSSION

Severe acute malnutrition (SAM) coupled with Spontaneous pneumothorax in neonates, though rare, presents a critical challenge requiring prompt recognition and management. This case of a 3-day-old female neonate underscores the importance of considering pneumothorax in the differential diagnosis of sudden respiratory distress in neonates. The clinical presentation of decreased breath sounds and asymmetrical chest expansion, corroborated by imaging findings, facilitated the diagnosis and timely intervention.

Similar cases have been documented in medical literature, providing valuable insights into the management and outcomes of neonatal pneumothorax. For instance, a study by Aly et al. (2004) reported on the incidence and management of spontaneous pneumothorax in a neonatal population, emphasizing the role of prompt chest radiography and early intervention to prevent complications. Another case series by Hsu et al. (2011) highlighted the effectiveness of minimally invasive techniques like needle aspiration in managing neonatal pneumothorax with favourable outcomes.

The discussion of similar cases reveals that while some neonates may exhibit spontaneous resolution of pneumothorax, others require more aggressive management, including chest tube placement. Factors influencing the decision include the size of the pneumothorax, the degree of respiratory compromise, and the overall health of the neonate. This case aligns with findings from previous studies, demonstrating that prompt intervention can lead to rapid recovery and favourable outcomes.

In conclusion, neonatal pneumothorax, though uncommon, should be promptly identified and managed to prevent adverse outcomes. Early imaging and appropriate intervention are crucial in ensuring positive results. This case adds to the growing body of literature on neonatal pneumothorax and emphasizes the need for heightened awareness among clinicians.

CONCLUSION

Respiratory tract infections and anemia is fairly Spontaneous pneumothorax in neonates is a rare but critical condition. Prompt diagnosis and intervention are crucial for favourable outcomes. This case illustrates the importance of considering pneumothorax in the differential diagnosis of neonatal respiratory distress and demonstrates effective management leading to successful recovery.

Conflict of interest

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