

Severe neonatal air leak syndrome – Answer

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The questions can be found in the following article:

Matos de Figueiredo C, Abreu Ferreira J, Freitas AC, Novo A, Proença E, Carvalho C, Neiva Araújo L.

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J Pediatr Neonat Individual Med. 2019;8(1):e080121. doi: 10.7363/080121.

Keywords

Air leak, pneumopericardium, pneumothorax, respiratory distress, prematurity.

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How to cite

Matos de Figueiredo C, Abreu Ferreira J, Freitas AC, Novo A, Proença E, Carvalho C, Neiva Araújo L. Severe neonatal air leak syndrome – Answer. J Pediatr Neonat Individual Med. 2019;8(1):e080122. doi: 10.7363/080122.

Answers

1. A. Initial chest radiograph showed bilateral air bronchogram with granular appearance – compatible with mild respiratory distress syndrome.

- B. Bilateral diffuse hypotransparency with air bronchogram and hypertransparency surrounding the heart shadow including its inferior surface – pneumopericardium.
 - C. Right pleural space hypertransparency, right lung collapse with heart and mediastinum left shift – right pneumothorax.
2. Air leak syndrome with pneumopericardium and pneumothorax in a preterm neonate with respiratory distress syndrome.
 3. Asymptomatic neonates with pneumopericardium require close monitoring and pericardiocentesis is only indicated if symptoms or signs of cardiac tamponade are present. Symptomatic pneumothorax is an indication for emergent thoracocentesis.

Introduction

Air leak syndromes include pulmonary interstitial emphysema, pneumomediastinum, pneumothorax, pneumopericardium, pneumoperitoneum, subcutaneous emphysema and systemic air embolism [1]. These syndromes are more common and severe among neonates with underlying lung disease, especially those with low birth weight and respiratory distress syndrome. Antenatal steroids and early surfactant administration can prevent and improve their outcome [1-3].

Clinical course

In the case reported, pneumopericardium was the first air leak presentation. Pericardial drainage was postponed due to cardiorespiratory stability on aminergic support. Air dissection into the pleural space led to tension pneumothorax, with gradual clinical improvement after thoracocentesis and chest tube placement. The thoracic drain was removed after 3 days with elective extubation on the 7th day of life (**Fig. 1**). She was discharged home at 36 weeks of postmenstrual age without any respiratory dysfunction.

Discussion

Pneumopericardium is a rare condition affecting almost exclusively preterm infants with respiratory distress syndrome on ventilation support [1, 2, 4]. Chest X-ray is a good diagnostic tool, showing the “halo sign” which represents the heart surrounded by air but with no extension beyond the pericardium reflection onto the great



Figure 1. Final X-ray showing the resolution of all air leak.

vessel [5]. When leading to cardiac tamponade, it can be life-threatening [2, 6]. If asymptomatic, only close monitoring is required. Pericardiocentesis is only indicated in case of hemodynamic instability and cardiac tamponade [1, 5].

Pneumothorax is the most common form of air leak. It may evolve to tension pneumothorax, which can lead to sudden cardiovascular collapse. The majority of small pneumothoraces resolve with conservative management. Emergent thoracocentesis with needle aspiration is indicated to relieve symptomatic or tension pneumothoraces. Chest tube insertion is needed in tension pneumothorax or mechanically ventilated neonates [1].

In this case, incomplete antenatal steroid therapy and the lack of surfactant administration could be implicated as risk factors, since both are known to improve respiratory distress outcome [3]. Another aspect that should be taken into account when programming ventilation support in preterm neonates is the concept of “gentle” ventilation [1].

Any neonate with respiratory distress and a significant increase in oxygen requirements should be evaluated for possible air leak [2]. Close monitoring is essential to identify complications and the need for intervention. Most neonatal air leaks resolve spontaneously.

The case presented, mainly for its clinical evolution, aims to emphasize the importance of prevention, timely diagnosis and adequate management of neonates with respiratory distress syndrome.

Declaration of interest

All Authors have no conflicts of interest to declare.

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