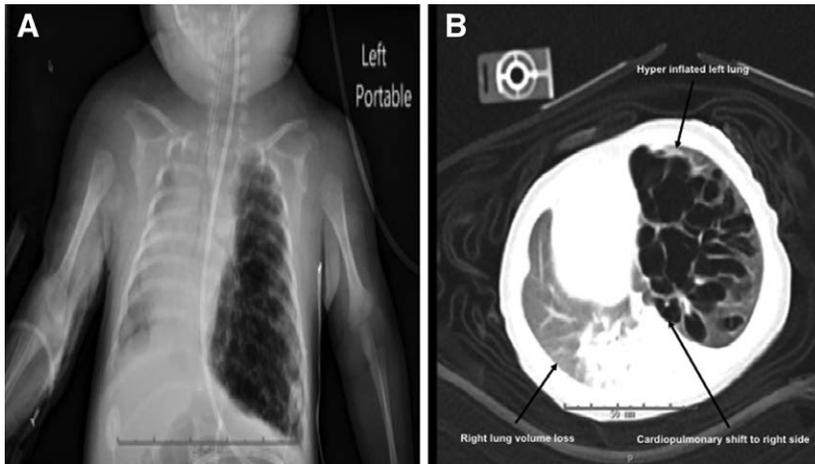


## Images in Anesthesiology: Persistent Pulmonary Interstitial Emphysema

Sheri Jones, M.D., Shanique Kilgallon, M.D., Alan Jay Schwartz, M.D., M.S.Ed.,  
Rajeev Subramanyam, M.D., M.S.



**P**ERSISTENT pulmonary interstitial emphysema is collection of air in the pulmonary interstitial tissue outside normal air passages. This air accumulation leads to cystic air spaces with hyperinflation of one lung and a mediastinal shift with associated contralateral lung volume loss (chest radiograph, *A*; computed tomography scan, *B*). It is a rare pathology seen in preterm infants with respiratory distress syndrome who have been mechanically ventilated.<sup>1</sup> Persistent pulmonary interstitial emphysema can occur in term infants and in those who have not been mechanically ventilated.

Persistent pulmonary interstitial emphysema manifests as localized or diffuse forms, the latter carrying a poor prognosis. Differential diagnosis includes cystic adenomatoid malformation, lobar emphysema, diaphragmatic hernia, or bronchogenic cyst.<sup>1</sup> Nonsurgical management includes selective bronchial occlusion, selective ventilation, steroids and/or surfactant, and lateral decubitus positioning with the upper good lung receiving most of the ventilation as compared to the dependent pathologic lung.<sup>1,2</sup> Extracorporeal membrane oxygenation has been used to ventilate patients while allowing lung healing. Indications for surgical intervention include: persistent respiratory distress, recurrent infection, pneumothorax, inability to wean from mechanical ventilation, and definitive diagnosis when there is concern for a more pathologic lesion.<sup>1</sup>

Anesthetic management consists of preoperative fluid resuscitation and evaluation of acid base status due to risk of respiratory acidosis. Induction can be achieved by sevoflurane or propofol or both followed by nondepolarizing muscle relaxation. Gentle positive pressure ventilation to avoid further inflation and gas trapping in the diseased lung is important. An arterial line may be indicated. Endobronchial intubation can be used to achieve one lung ventilation. Continued postoperative respiratory support *versus* extubation is individualized. Postoperative analgesia is provided with parent- or nurse-controlled analgesia.<sup>3</sup>

### Competing Interests

The authors declare no competing interests.

### Correspondence

Address correspondence to Dr. Subramanyam: subramanyr@email.chop.edu

### References

1. Sica M, Molinaro F, Angotti R, Mazzei O, Messina M: A case of diffuse persistent pulmonary emphysema: When is difficult the diagnosis? *J Ped Surg Case Reports* 2016; 12:11–5
2. Cohen RS, Smith DW, Stevenson DK, Moskowitz PS, Graham CB: Lateral decubitus position as therapy for persistent focal pulmonary interstitial emphysema in neonates: A preliminary report. *J Pediatr* 1984; 104:441–3
3. McCartney CJ, Johnston G: Anaesthetic management of a 6-week-old child with unilateral pulmonary interstitial emphysema. *Paediatr Anaesth* 2000; 10:325–8

From the Department of Anesthesiology and Critical Care, Children's Hospital of Philadelphia, University of Pennsylvania, Perelman School of Medicine, Philadelphia, Pennsylvania.

Copyright © 2018, the American Society of Anesthesiologists, Inc. Wolters Kluwer Health, Inc. All Rights Reserved. *Anesthesiology* 2018; 129:808