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## CONGENITAL LOBAR OVERINFLATION

Dr Sudha kiran Das Dr  
JSSAHER, sudha7492@gmail.com

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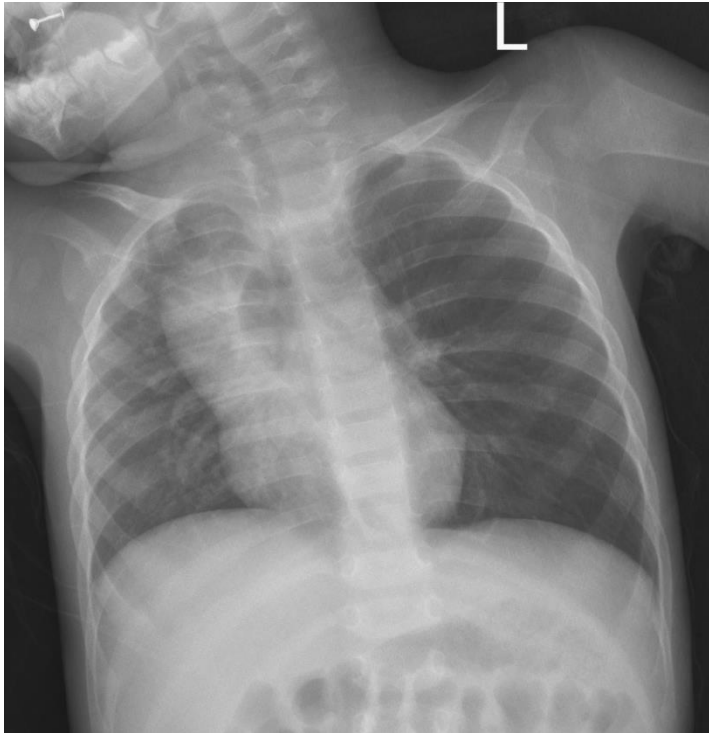
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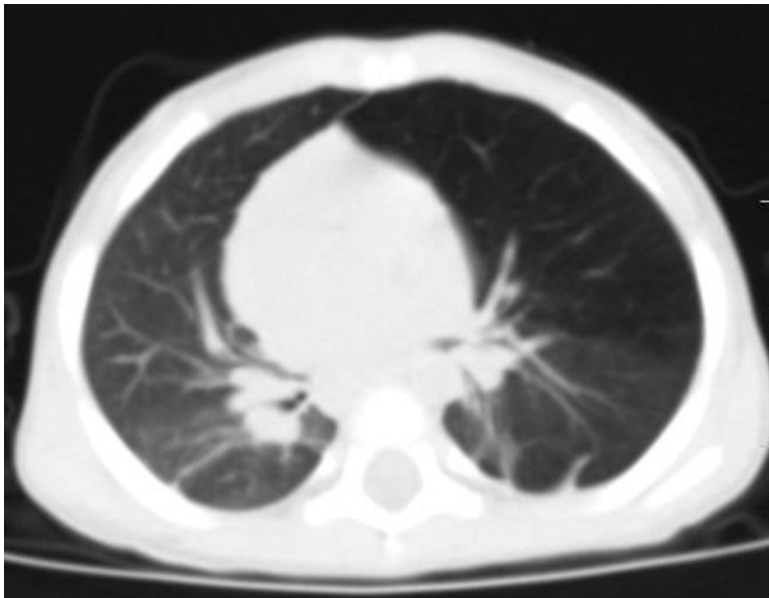
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**HISTORY:**

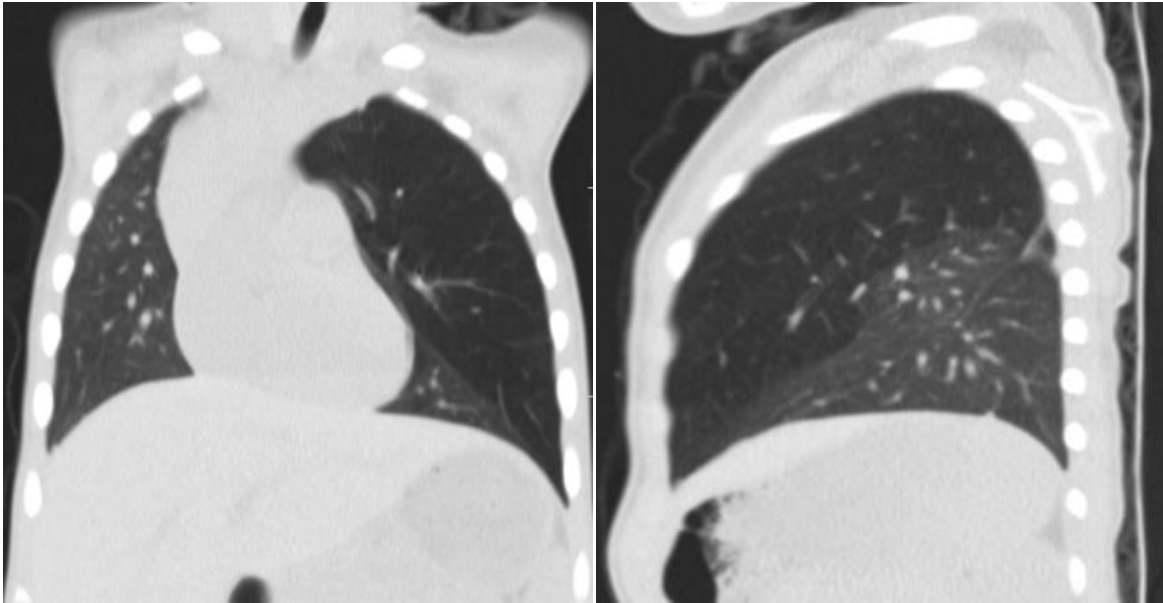
**1year old girl with history of recurrent respiratory infections associated with wheeze.**



**Figure 1: Plain Radiograph of the Chest. Hyperlucent left lung with rightward mediastinal shift.**



**Figure 2: Axial CT of the Chest. Hyperinflated upper lobe of left lung with rightward mediastinal shift.**



**Figure 3: Coronal and Sagittal CT of the Chest. Hyperinflated upper lobe of left lung with rightward mediastinal shift.**

**FINAL DIAGNOSIS:** Congenital lobar overinflation

### **Discussion:**

Congenital lobar overinflation (CLO) (previously called congenital lobar emphysema) is a congenital lung abnormality that results in progressive overinflation of one or more lobes of a neonate lung. Various mechanisms have been postulated including an obstructive check valve mechanism at the bronchial level <sup>1</sup>.

### **Epidemiology**

Congenital lobar overinflation is more common in males (M:F = 3:1) <sup>2</sup>.

### **Clinical presentation**

Patients typically present with respiratory distress, most commonly in the neonatal period, and usually within the first 6 months of life <sup>2</sup>. Only 1/3 are manifest at birth; most are some weeks later. Predilection for the left upper lobe and less so for RML.

## **Pathophysiology**

In congenital lobar overinflation, a lobe (or more) become distended and may or may not have more alveoli. There are many presumed mechanisms for progressive overdistension of a lobe including obstruction, cartilage deficiency, dysplasia, and immaturity. Most cases are idiopathic.

## **Associations**

CLO may be associated with congenital heart defects such as:

- ventricular septal defect (VSD)
- patent ductus arteriosus (PDA)

## **Radiographic features**

Interestingly there is quite a pronounced predilection for some lobes:

- left upper lobe: most common, 40-45%
- right middle lobe: 30%
- right upper lobe: 20%
- may involve more than a single lobe in 5%
- much rarer in the lower lobes.

Therefore despite the left upper lobe being most commonly affected, the right hemithorax is the most common side to be affected <sup>3</sup>.

## **Chest radiograph:**

### **Immediate postpartum period**

The affected lobe tends to appear opaque and homogeneous because of fetal lung fluid or it may show a diffuse reticular pattern that represents distended lymphatic channels filled with fetal lung fluid.

### **Later findings**

- appears as an area of hyperlucency in the lung with a paucity of vessels
- mass effect with mediastinal shift and hemidiaphragmatic depression
- decubitus films lying on the affected side will show little or no change in lung volume
- lateral film may demonstrate posterior displacement of the heart

### **CT chest**

- shows above features in greater detail
- attenuation of vascular structures in affected lobe <sup>1</sup>
- may also show compressive atelectasis of neighbouring lobes

## **Treatment**

Mildly symptomatic patients are usually followed up. A lobectomy can be considered in severe cases <sup>1</sup>.

## **Differential diagnosis**

General imaging differential considerations include:

- congenital cystic adenomatoid malformation (CCAM)/congenital pulmonary airway malformation (CPAM)
- pulmonary arterial hypoplasia
- pulmonary hypoplasia
- bronchial atresia: the distal to the atretic segment can have air trapping
- tetralogy of Fallot

1. Daltro P, Fricke BL, Kuroki I et-al. CT of congenital lung lesions in pediatric patients. AJR Am J Roentgenol. 2004;183 (5): 1497-506. AJR Am J Roentgenol .

2. Donoghue VB, Bjørnstad PG. Radiological Imaging of the Neonatal Chest. Springer Verlag. (2007) ISBN:3540337482.

3. Stigers KB, Woodring JH, Kanga JF. The clinical and imaging spectrum of findings in patients with congenital lobar emphysema. Pediatr. Pulmonol. 1992;14 (3): 160-70.