Imaging Sciences Interesting Cases

CASE 27

Christopher Mosley, MD

CLINICAL PRESENTATION: Patient with asthma, presenting with abnormal breath sounds and wheezing.

IMAGING FINDINGS: Right middle lobe atelectasis. Mild peribronchial cuffing. Prominent upper lung zone interstitial markings.

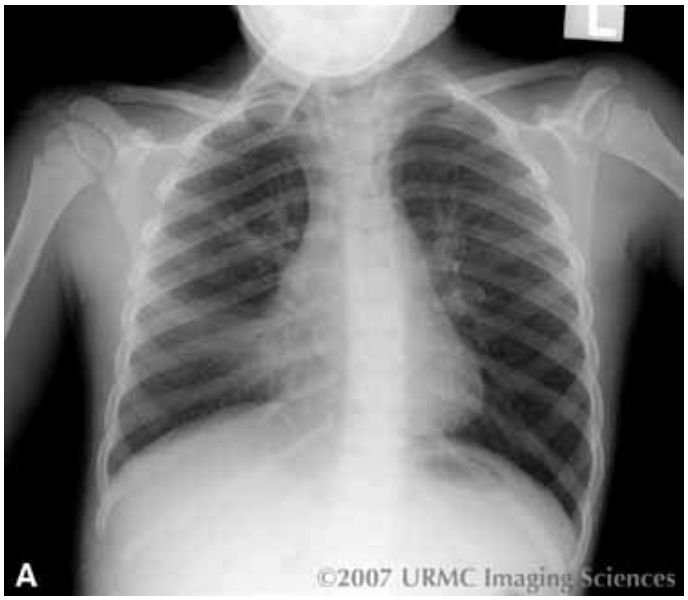

Figure 1A. PA radiograph demonstrates silhouetting of the right heart border with a hazy opacity in the right mid to lower lung zone, consistent with right middle lobe atelectasis. In addition, there are mild increased markings in the bilateral upper lung zones.

Figure 1B. Lateral radiograph demonstrates a wedge-shaped opacity extending anteriorly and inferiorly from the hilar region, consistent with right middle lobe atelectasis.

Figure 1C. PA radiograph of the same patient from 5 weeks later demonstrates resolution of the previously identified hazy opacity in the right mid to lower lung zone and a normal right heart border.

Figure 1D. Lateral radiograph of the same patient from 5 weeks later demonstrates resolution of the previously identified wedge-shaped opacity extending from the hilar region.

DIAGNOSIS: Right Middle Lobe Atelectasis

DISCUSSION: Atelectasis is the collapse of a portion or collapse of an entire lung. Atelectasis can be caused by a variety of conditions, including asthma, mucus plugs, and tumor, to name a few. Children with asthma may commonly experience right middle lobe atelectasis. Right middle lobe atelectasis is characterized by silhouetting of the right heart border with opacity in the right mid to lower lung zone on the PA radiograph. On the lateral radiograph, right middle lobe atelectasis is characterized by a wedge-shaped opacity that extends inferiorly and anteriorly from the hilar region. Although asthma-associated edema and inflammation are contributing factors, the exact reason for the frequency of right middle lobe collapse seen in children with asthma is unknown. Certain factors do however predispose the right middle lobe to atelectasis. The narrow diameter of the right lobar bronchus and its acute take-off angle create conditions that are unfavorable for drainage. In addition, the relative anatomical isolation of the middle lobe and poor collateral ventilation decrease the chance of reinflation once atelectasis occurs.

In some cases, right middle lobe atelectasis may become more severe, resulting in the so-called right middle lobe syndrome (RMLS). RMLS may occur in children with right middle lobe atelectasis and a structural right middle lobe bronchus abnormality or lymphadenopathy surrounding the right middle lobe take-off. RMLS may lead to permanent damage to the right middle lobe, bronchiectasis, abscess, and may eventually require surgical resection. Right middle lobe atelectasis related to asthma must be differentiated from right middle lobe pneumonia and atelectasis due to foreign body aspiration.

The majority of patients with right middle lobe atelectasis or RMLS can be managed as outpatients, although exacerbations may require inpatient treatment with IV antibiotics. Follow-up chest radiographs should be obtained to assess for response to therapy and re-expansion of the right middle lobe.

REFERENCES:

1. Redding GJ. Atelectasis in childhood. Pediatr Clin North Am. 1984 Aug;31(4):891-905. [PubMed]
2. Wittig HJ, Chang CH. Right middle lobe atelectasis in childhood asthma. J Allergy. 1967 Apr;39(4):245-53. [PubMed]
3. Dees SC, Spock A. Right middle lobe syndrome in children. JAMA. 1966 Jul 4;197(1):8-14. [PubMed]