47-year-old female presents with complaints of shortness of breath, cough productive of green sputum, and subjective fever.

Gregory Wilson MS3
Texas A&M School of Medicine

Mark Sultenfuss, MD
Houston Methodist
Patient Presentation

• 47-year-old female with a past medical history of chronic rhinosinusitis presented with complaints of shortness of breath, cough productive of green sputum, and subjective fever.

• Vitals: BP 124/68 mm Hg, HR 89 bpm, RR 19, Temp 97.8 °F, SpO2 99% on room air.

• Physical Exam: Rales appreciated on auscultation of both lung. Heart – regular rate and rhythm. Normal S1 and S2. No clubbing or cyanosis of the extremities.
Pertinent Labs

• WBC 12.6 (4.2 – 11.0)
• Neutrophils 77.1% (36.0 – 66.0)
• Hgb 8.6 (11.5 – 15.3)
• Procalcitonin .26 (0.0 – 0.08)
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

Variant 2: Acute respiratory illnesses in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
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<tbody>
<tr>
<td>Radiography chest</td>
<td>Usually Appropriate</td>
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<tr>
<td>US chest</td>
<td>May Be Appropriate</td>
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<tr>
<td>CT chest with IV contrast</td>
<td>Usually Not Appropriate</td>
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<td>CT chest without and with IV contrast</td>
<td>Usually Not Appropriate</td>
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<td>CT chest without IV contrast</td>
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<td>MRI chest without and with IV contrast</td>
<td>Usually Not Appropriate</td>
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<td>Usually Not Appropriate</td>
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This imaging modality was ordered by the internist.
Findings (labeled)

Subtle bilateral lower lobe infiltrates with faint nodules, possibly reflecting acute bronchiolitis on chronic change. Consider chest CT.

Dextrocardia with heart size at upper limit of normal.

Right aortic arch.
Select the applicable ACR Appropriateness Criteria

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<tr>
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This imaging modality was ordered by the internist.
Findings (unlabeled)
Findings (labeled)

Peripheral nodule with surrounding ground glass opacities

Bilateral lower lobe bronchiectasis with peribronchiolar wall thickening

Situs Inversus – liver on the left side

Nodules with tree-in-bud pattern
Findings (unlabeled)
Findings (labeled)

- Dextrocardia
- Right middle lobe and lingula bronchiectasis with peribronchiolar wall thickening
Final Dx:

1) Kartagener Syndrome
2) Pneumonia
Case Discussion

• Primary ciliary dyskinesia (PCD) is a genetic disease characterized by congenital dysfunction of cilia in the airway
• Incidence: 1/10,000 – 30,000
• Clinical features:
  • Recurrent upper and lower respiratory tract infections
  • Chronic rhinosinusitis
  • Situs Inversus – present in about ½ of patients with PCD
  • Male infertility and decreased fertility in females
• Kartagener syndrome is defined as the presence of situs inversus, chronic rhinosinusitis, and bronchiectasis in a patient with PCD
Case Discussion

• Radiological features of Kartagener syndrome
  • Situs inversus
  • Hyperinflation of the lungs
  • Peribronchial thickening
  • Atelectasis
  • Mucus plugging
  • Bronchiectasis – usually cylindrical or saccular
    • Bronchiectasis, when it does occur, usually found in the right middle lobe and lingula, and lower lobes
Case Discussion

• Pneumonia is defined as an infection involving pulmonary parenchyma

• Recurrent pneumonias are often seen in patients with Kartagener Syndrome secondary to impaired mucociliary clearance

• Radiological features of pneumonia:
  • Lobar pneumonia: confluent consolidations of one lung segment or lobe
  • Bronchopneumonia: centrilobular nodules that coalesce throughout one or multiple lobes of the lung
  • Interstitial pneumonia: Septal thickening, nodules, and areas of ground glass opacities
  • These features may overlap and can be present regardless of the causative organism
