Hole in the Lung:
A Case of Cavitary Pneumonia with an Unexpected Culprit

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Case Background

- 51-year-old female with severe malnutrition (BMI 12.4 kg/m2) presented with one week of dyspnea and cough.
- Past medical history: eating disorder, small intestinal bacterial overgrowth (SIBO), gastroparesis
- Examination: hypoxic to 90%, signs of protein-calorie malnutrition.

Workup & Management

- **Index admission:**
  - Significant labs: WBC of 15 x 103/uL
  - CT chest: a large left apical cavitary lesion measuring 6.8 x 7.5 x 4.8 cm, consistent with necrotizing pneumonia (image 1).
  - Sputum culture: growing resistant Escherichia coli
  - Serum quantiferon, (1,3)-beta-D-glucan, and sputum acid-fast bacilli (AFB) all negative.
  - Intravenous ertapenem, discharged with plan for prolonged antibiotic.
- **Readmission** 3 days later:
  - CT chest showing mildly increased size of the cavitary lesion.
  - Continued on same antibiotics, supportive care and chest physiotherapy
- One month later, repeat CT showed worsening of the cavity and a new left lower lobe infiltrate.
  - Antibiotics were changed to meropenem and vancomycin.
  - Repeat sputum culture showed no growth.
  - Bronchoscopy with unremarkable bronchial washings and negative cultures
- Next three months: symptoms improve. Follow up CT showed gradual decrease of left lower lobe consolidation with residual scarring, apical cavity remained unchanged.

Imaging

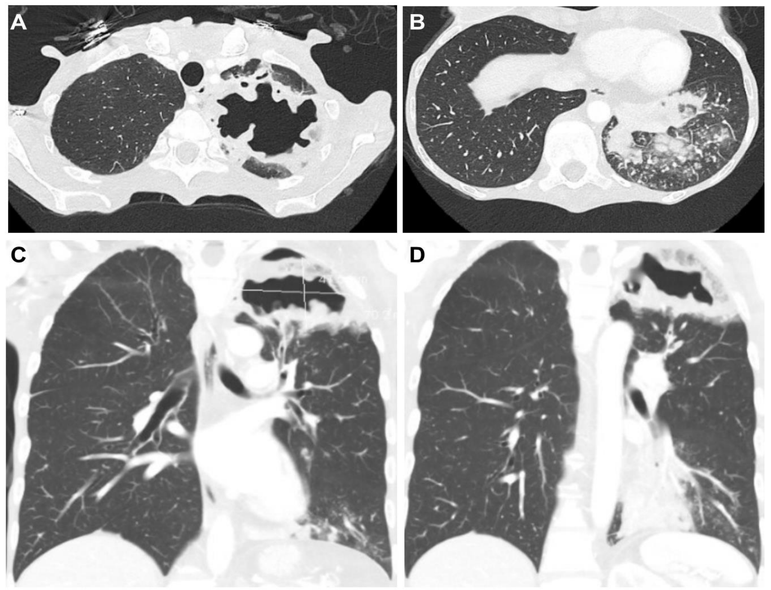

Image 1: CT chest on index admission showing left apical cavitary lesion and left lower lobe reticulonodular infiltrates

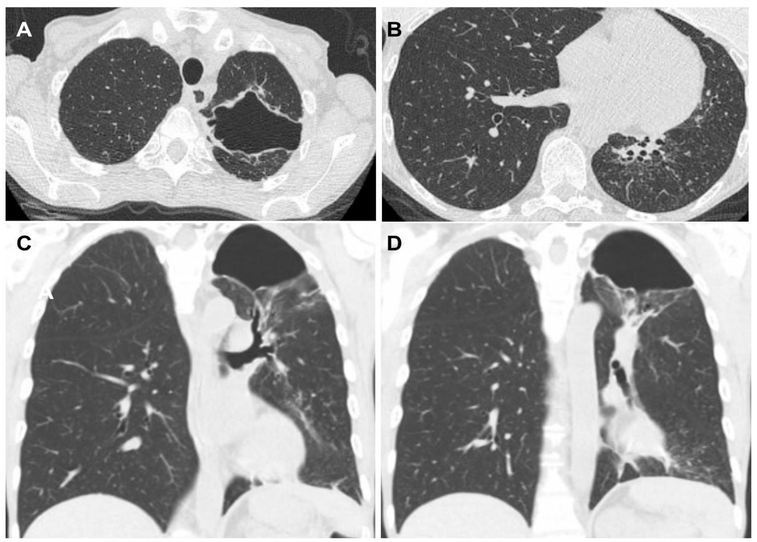

Image 2: Interval CT chest 4 months later showing persistent left apical cavity, development of apical fibrosis, volume loss, mediastinal shift and left lower lobe scarring.

Discussion

- Necrotizing pneumonia can present with severe sepsis and escalate to pulmonary gangrene, with a high mortality rate [1].
- Most commonly caused by Staphylococcus aureus, Streptococcus pneumoniae, and Klebsiella pneumoniae through suppurative necrosis of pyogenic lung abscesses [2].
- Pulmonary gangrene is more common in gram-negative organisms, particularly Klebsiella and Pseudomonas.
- Incidence of E. coli necrotizing pneumonia is low and management is difficult due to the lack of guidelines [2].
- While the underlying cause remains unclear, reports of E. coli necrotizing pneumonia have been associated with microaspiration of secretions [3].
- Hypothesized that this patient's history of gastroparesis, SIBO, and malnutrition leading to relative immunocompromise, contributed to necrotizing pneumonia.
- Main treatment remains definitive intraveous antibiotics based on sensitivities.
- Pulmonary resection can be considered but is mostly for complications of pulmonary gangrene or unresponsiveness to antibiotics.

References

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