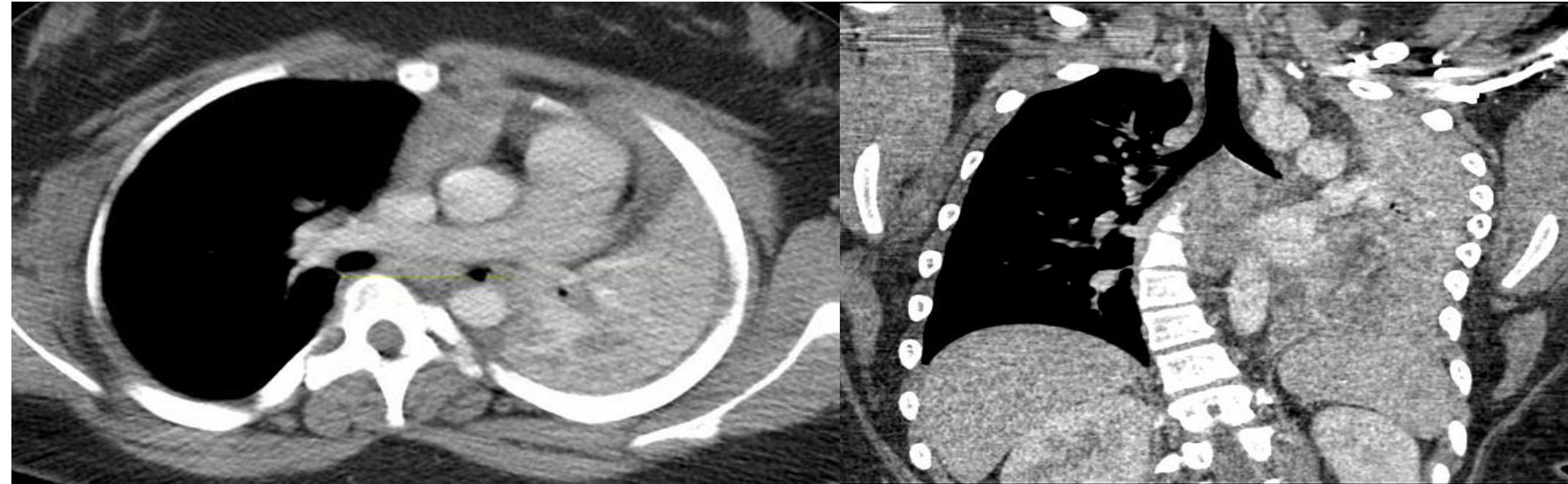


## Introduction

- 12 year old obese female with severe asthma, not compliant on meds, transferred from OSH to PICU for management of severe status asthmaticus.
- Prior to transfer, no improvement with magnesium, steroids, or continuous nebs. Started BIPAP with heliox.
- Five hospitalizations for asthma in the past year During PICU admission 2 months ago, bronchoscopy demonstrated fibrinous inflammatory exudates.



**Figure 1:** CT scan 2 months prior to admission demonstrating complete collapse of left lung from left main bronchus occlusion

## Intraoperative Course

- To OR for DLB on hospital day 5 for airway clearance.
- During removal of large cast from left mainstem bronchus, debris became lodged in the trachea and was unable to be removed or advanced.
- Patient suffered near- cardiopulmonary arrest due to poor ability to ventilate or oxygenate.
- Emergently cannulated to V-V-A ECMO for impending hemodynamic collapse. Later converted to V-V ECMO.
- Otolaryngology removed several more large casts after ECMO initiation, however many remained.

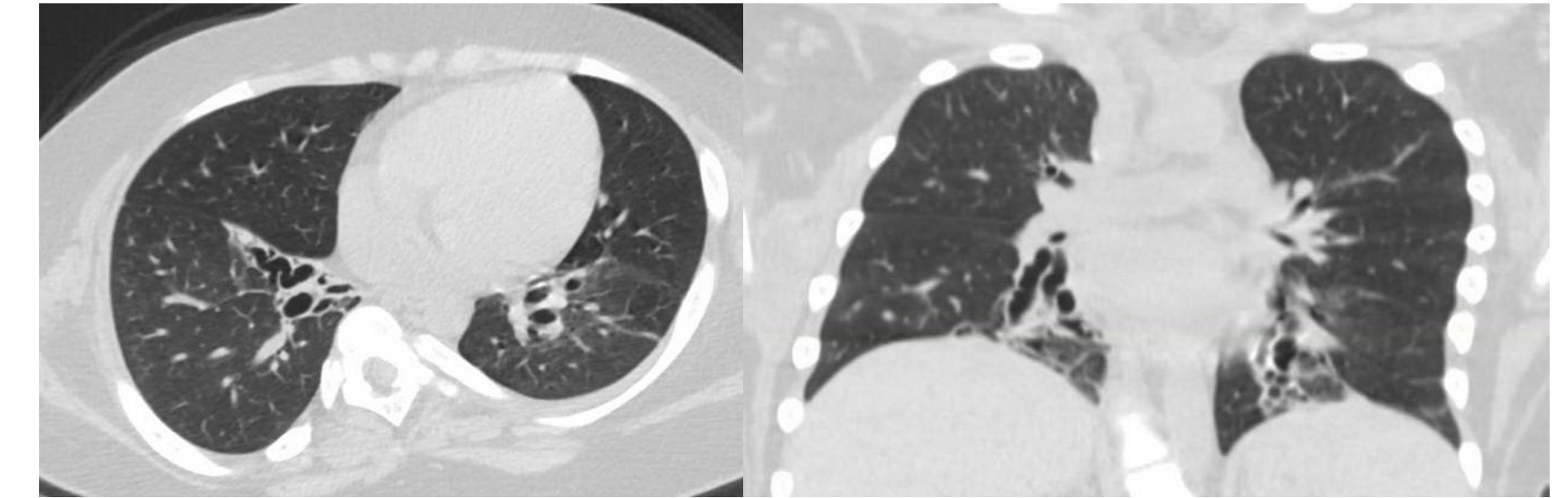
## Postoperative Course

- POD 1: Six hour bronchoscopy performed in PICU to remove casts.
- POD 2: Bronchoscopy with cryoprobe to remove casts.
- POD 3: Bronchoscopy with significantly improved cast burden.
- POD 7: Bronchoscopy. V-V ECMO decannulation
- POD 24: Patient extubated
- POD 34: Patient transferred to rehabilitation facility
- POD 57: Patient discharged home from rehabilitation facility

## Imaging



**Figure 2:** Bronchial branching cast obstructing the left main bronchus



**Figure 3:** CT Chest 2 months later showing resolution of severe atelectasis. Severe varicose bronchiectasis centrally within bilateral lower lobes.

## Discussion

- Plastic bronchitis is a rare disease of unclear etiology with poor prognosis
  - Associations:
    - Congenital heart disease ~40%
    - Toxic inhalation
    - Severe asthma ~30%
    - Sickle cell disease
    - Pulmonary lymphatic abnormality
    - Influenza A infection
  - Mortality 5-60%
  - Cases associated with CHD have higher mortality rates
- Classic Presentation:
  - 4-12 years old
  - Expectoration of large, branching bronchial casts
  - Bronchial occlusion with ipsilateral atelectasis
- Diagnosis confirmed by bronchoscopy
- Histological classification:
  - Type 1: inflammatory casts composed of inflammatory cells and fibrin. Associated with inflammatory diseases of the lung
  - Type 2: acellular casts composed primarily of mucin. More common in patients with severe cyanotic heart disease

## Discussion

- Treatment/Management:
  - Bronchoscopy rigid vs. flexible, +/- cryoablation
  - Supportive therapy with aggressive pulmonary hygiene:
    - Chest physiotherapy
    - Mucolytics: inhaled N-acetyl-cysteine or dornase alfa
    - Fibrinolytics: aerosolized heparin, urokinase, or tPA
    - Other: inhaled corticosteroids, hypertonic saline nebs
  - Possible thoracic duct ligation

## Conclusion

- Plastic bronchitis is a rare, poorly understood disease characterized by potentially catastrophic airway obstruction.
- Repetitive bronchoscopic cast removal, supportive care and pulmonary hygiene are mainstays of management.
- Consider transferring these patients to a facility with ECMO capabilities for operative interventions as rapid and profound deterioration is possible.
- Further research is imperative to improving our understanding of the pathophysiology of plastic bronchitis and discover new treatment options

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