Complicated Pneumonia Pathway

Community Acquired Pneumonia without improvement within 48 hours and/or clinical deterioration.

Do you suspect effusion?

- Obtain chest Ultrasound

If Clinical deterioration

{+} For Fluid >10 mm >1/2 thorax

(−) For Fluid <10 mm <1/2 thorax

If stable

- CBC, BCX, CRP, Repeat CXR
- ID, Surgery and Pulmonary Consults
- Transfer to Children’s Hospital

Consolidation without effusion

- Consider alternative antibiotic coverage or workup per ID

If low output or loculation

- Administer tPA 4 mg in 40 ml of normal saline (0.1mg/ml) up to three doses 24 hours apart

- IR Consult for Chest Tube placement for drainage
  - Fluid analysis: Cell count, culture, glucose, protein, pH, LDH and specific gravity

- If stable
  - Consider alternative antibiotic coverage or workup per ID
  - CT Chest with IV contrast

- If clinical deterioration
  - Yes
    - VATS/Drainage

Is there empyema, pleural disease or abscess?

- Yes
  - ICU Admit:
    - Respiratory failure → mechanical ventilation
    - BAL if vented
    - Hemodynamic instability
    - Altered mental status (hypercarbia hypoxia)
  - Consider Immunology Consult:
    - Recurrent Pneumonias
    - Multilobal Pneumonias
    - Severe, prolonged course
    - Infections of other sites (ear, sinuses, skin, etc.)
    - Infections with low-virulence organism
    - Cytopenias

ID Considerations:
- Antibiotics (minimum two weeks)
- Influenza PCR and empiric tamiflu
- PICC placement
- Third-generation cephalosporin + clindamycin
- If septic consider Vancomycin
- Consider azithromycin if increased index of suspicion for mycoplasma/chlamydia
- Review allergy history

Pulmonary Consideration:
- Recurrent Pneumonia
- Chronic lung disease
- Neuromuscular disease
- Aspiration
- Congenital heart disease
- Bronchiectasis
- Immunodeficiency
- Primary ciliary dyskinesia
- Sickle cell disease

Is there pleural disease?

Yes

Repeat chest ultrasound

- IR Consult for Chest Tube placement for drainage
- Fluid analysis: Cell count, culture, glucose, protein, pH, LDH and specific gravity

- If stable
  - Consider alternative antibiotic coverage or workup per ID
  - CT Chest with IV contrast

- If clinical deterioration
  - Yes
    - VATS/Drainage

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References


Clinical Characteristics of Children with Complicated Pneumonia caused by *Streptococcus Pneumoniae*. Tan, T. Mason, E. Wald, E. et al. Pediatrics 2002;110;1