TB or Not TB?
Case 1
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Background
- 26-year-old African-American male
- Born and raised in Bay Area of California
- Convicted of cocaine trafficking 6 months previously and serving sentence in Kern County California
- Heavy alcohol use, some marijuana, denied intravenous drug use (IDU)
- Has sex with men (MSM)

Presenting Symptoms
- Presented to prison clinic 11/30/09 complaining of:
  - Cough x 4 weeks
  - Weight loss of 20 lbs over 4 weeks
  - Diarrhea x 4 weeks
  - Short of breath (SOB) x 2 weeks
  - Slow mentation x 2 weeks
  - Fever x 1 day
- Patient immediately hospitalized
Physical Exam

- Thin; moderate respiratory distress
- Temp=102°F, P=135, R=24, BP 101/71, O₂ Sat=95%
- Lungs clear to auscultation
- Liver enlarged
Diagnostic Studies

- Labs:
  - Albumin 2.6, AST 107, ALT 83, AP 440
  - Hgb 9.7, WBC 2,900, 94% neutrophils, platelets 95K
  - HIV antibody negative
- Bacteriology:
  - No sputum collected
  - BAL 12/2: AFB smear negative/culture pending, fungal stains negative, PCP stain negative

What Would You Do Now?

- What is the most likely diagnosis?
  - Mycobacterial
  - Viral
  - Bacterial
  - Fungal
- Are there any non-infectious possibilities?

Miliary Pattern

Any difference in chest x-ray (CXR) presentation?

- Miliary TB
- Metastatic thyroid CA
- Talc granulomatosis

All miliary pattern = hematogenous spread

Images courtesy T. Lee, M.D.
DDX of Miliary CXR Findings
- Tuberculosis
- Sarcoïdosis
- Fungal diseases
  - Histoplasmosis, Coccioidiomycosis, Blastomycosis, Cryptococcosis
- Pneumoconioses
- Acute allergic alveolitis/fibrosing alveolitis
- Tropical pulmonary eosinophilia
- Lymphoma
- Carcinomatosis

What Would You Do Now?
Polling question:
Would you begin empiric treatment and with which agents?
A. Anti-fungal rx
B. Anti-bacterial rx
C. 4 drug anti-TB rx
D. 4 drug anti-TB rx plus A or B
E. No empiric rx

Hospital Course
- Dx:
  - ARDS requiring mechanical ventilation
  - Rule out miliary TB
- Treatment: steroids, broad spectrum antibiotics, standard 4 meds against TB (RIPE)
- Discharged 12/9 improved
Subsequent Course

- By 12/23 patient felt worse and complained of more SOB and recurrence of fever. Re-admitted to hospital
- Cultures from his bronchoscopy remained negative for AFB
- CXR unchanged
- TB meds held
- Cocci serology obtained:
  - Enzyme Immunoassay (+)
  - Confirmed with Immunodiffusion comp fix titer 1:32

What Would You Do Now?

Polling question:
Now that you have a positive cocci serology result, would you continue empiric TB rx?
A. Yes
B. No

What Would You Do Now? (2)

- Is TB still possible?
- Do you need to treat the Cocci?
- How do you treat a dual infection with both TB and a fungus?
Inpatient Course

- Itraconazole 200 mg bid begun
- Patient continued to be treated with EMB, Moxifloxacin, and Streptomycin until BAL culture still negative at 6 weeks
- Treated for coccidioidomycosis with Itraconazole for 6 months
- Patient rapidly improved and final CXR was normal

Coccidioidomycosis

- Although a miliary (disseminated) picture is not common in Cocci, it does occur more frequently in certain ethnic groups, notably AA and Filipino
- More commonly, “valley fever” causes pulmonary nodules or consolidation
- A classical picture is the thin walled cavity
Cocci: Thin-walled Cavity

DDX: Granulomatous Lung Disease

<table>
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<th>Infections</th>
<th>Noninfectious diseases</th>
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<tbody>
<tr>
<td>Mycobacteria</td>
<td>Sarcoïdosis</td>
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<tr>
<td>M.Tb</td>
<td>Chronic beryllium disease</td>
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<tr>
<td>NTM</td>
<td>Hypersensitivity pneumonia</td>
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<tr>
<td>Fungi</td>
<td>Lymphoid interstitial pneumonia</td>
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<td>Histoplasma</td>
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<td>Cryptococcus</td>
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<td>Coccioidiases</td>
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<td>Blastomycosis</td>
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<td>Pneumocystis</td>
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<td>Aspergilus</td>
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<td>Parasites</td>
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<td>Dirofilaria</td>
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Case 1: Summary Points

- CXR pattern: Miliary
  - Infectious and non-infectious differential dx
- Subacute presentation
  - Raises suspicion for fungal (or non-infectious) – serology tests important
- Empiric treatment for TB
  - Start if moderate to high suspicion
  - Look for drug interactions
  - Stop rx – reasonable alternate diagnosis, may wait for culture results and stop vs. treat as culture negative TB