TB or Not TB?
Case 2
Phil Hopewell, M.D.
Curry International Tuberculosis Center, UCSF
(Slide contributions:
Dave Park, M.D.,
University of Washington)

Case 2: Relevant History
- 54-year-old African-American man
- Chronic cough, worse for past 3 months, occasionally productive of blood tinged sputum
- Mild-moderate shortness of breath with exertion
- Denies fever
- Approximately 15 lb weight loss
- Unemployed construction worker, recovering alcoholic, 60 pack year smoker;
- No known TB exposures or TB risks;
- Negative HIV test 3 years prior (not documented)

Case 2: Physical Exam and Lab Data
- Vital signs: Afebrile, BP 108/82, P 86, R 14
- Appears chronically ill with evident weight loss
- No lymphadenopathy; lungs clear; cardiac exam normal; abdomen soft with no organomegaly, masses, or fluid; no leg edema; digital clubbing noted
- HCT-34, WBC 8,600 (nl diff), Na, K, Cl, CO₂, creatine, LFTs all normal except for a serum albumin of 3.2mg/dl
Case 2: Initial Chest Film

Case 2: Sputum Smear Microscopy

Case 2: Treatment Response

- Treatment begun with RIPE
- Sputum culture grew *M. tb*
- Cough improved
- Sputum smear was negative at 2 months
- Weight loss continued and he had new onset of chest pain
Case 2: Comparison of Films

Baseline

Month 2

Case 2: Questions at this Point

- Are the organisms susceptible?
- Is the patient taking his drugs?
- Is he absorbing the drugs?
- Does he have another disease?
- What is the differential?
- What to do now?

Case 2: Questions at this Point (2)

- Are the organisms susceptible?
The organisms were fully susceptible to first-line drugs
- Is the patient taking his drugs?
  He was on daily DOT
- Is he absorbing the drugs?
  His urine was reported to be orange but serum concentrations were not measured

The organisms were fully susceptible to first-line drugs

Are the organisms susceptible?

He was on daily DOT

His urine was reported to be orange but serum concentrations were not measured
Case 2: Subsequent Follow-up

- Completed 4 months DOT
- Lost to follow-up x3 months
- Returned with further weight loss and persistent chest pain
- Sputum AFB smears negative
- A repeat CT was obtained
Case 2: Questions at this Point (3)

- Is this incompletely treated, (recurrent) TB?
- Is drug resistance likely?
- Should an empiric regimen for MDR TB be started?
- Should additional diagnostic studies be performed?
Case 2: Evaluation on Return

- Sputums obtained and were smear negative
- Restarted on RIPE pending culture and DST results
- Bronchoscopy: BAL and transbronchial biopsy positive for adenocarcinoma
- All cultures were negative for M. tb

Shared Features of TB and Lung Cancer

- Shared risks – smoking? occupational exposures?
- Similar clinical presentations – chronic wasting illness, cough, chest pain, dyspnea, hemoptysis, extrapulmonary findings
- Shared radiographic features – nodular infiltrates and masses, cavitation, adenopathy, pleural effusions

Can TB Increase Cancer Risk?

Some evidence to suggest:

- Taiwan: 4480 TB pts. out of 716,872 cohort followed 5 years. Incidence of lung CA in pt. with TB hx was 11-fold higher (hazard ratio 3.32)  
  Yu et al., Increased lung cancer risk among patients with pulmonary tuberculosis: A population cohort study. J Thorac Oncol 2011
- Systematic review: (41 case control and cohort studies) found association between TB and lung adenocarcinoma, especially prevalent in Asia  
When to Suspect Cancer

Initial Evaluation:
- Risks for lung cancer present
- Mass-like lesion on CXR
  - Consider CT early on or
  - Early CXR follow-up at 1-2 months to verify abnormalities NOT progressing (and hopefully responding to TB treatment)

During TB treatment:
- Progression of symptoms/CXR on adequate TB treatment (good DOT and drug absorption)

TB or Not TB? – Cysts and Cavities

Helpful radiographic features that suggest benign vs. malignant diagnoses?

- Benign cysts: uniform wall thickness, 1mm, smooth inner lining (ex. PCP)
- Benign cavities: max. wall thickness ≤ 4 mm minimally irregular inner lining (ex. TB)
- Malignant cavities: max wall thickness ≥ 16 mm irregular inner lining

Images courtesy M. Gotway, MD, and T. Lee, MD

Example: Malignant Features

Other findings and tests that suggest malignancy:
- Spiculated contours
- (Eccentric calcification – not shown)
- Hypermetabolic PET scan
- [Features suggested malignancy – biopsy done – but diagnosis TB! Improved with treatment]

Images courtesy Tan et al., AJR 2010; 294

Hopewell – Case 2
TB DDX: Other Possibilities?

If clinical/radiographic picture not improving on treatment, what else can it be?

- Non-infectious/ non-malignant ddx of “TB-like” abnormalities can be broad → consider referral to specialist
- If biopsy shows “granulomatous” process but no organisms or growth on culture?

TB vs. Malignancy

How else can malignancies and TB be confused with each other?

- Mass-like lesions/solitary pulmonary nodules
- Lymphangitic infiltrates
- Intrathoracic adenopathy with constitutional “B” symptoms (think lymphoma)
- Hematogenous spread = miliary pattern
- Extrapulmonary sites (esp. GI, peritoneal, bone, CNS, pleural)

Case 2: Take-home Points

- Monitoring the response to treatment is nearly as important as initiating treatment.
- If the response is not as expected, especially if the response is slow or incomplete, reconsider the differential diagnosis and reevaluate.
- TB and lung cancer share a number of features and can mimic one another.
- Radiographic findings can suggest malignancy although are nonspecific.