



## “Doctor, why am I so sick?”

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**G**abriel, 79, presents with the following complaints:

- cough,
- general tiredness,
- body aches and
- a 15 lb weight loss over the last two months.

- Cardiovascular exam: heart sounds normal with no cardiac murmurs
- Abdomen: not tender and no mass
- Right inguinal hernia
- No peripheral edema
- No skin rashes

### Gabriel's medical history

Gabriel's medical history reveals that he:

- is diabetic taking 5 mg of glyburide b.i.d.,
- quit smoking 40 years ago,
- is a social drinker,
- is a retired farmer and
- is a widow with three daughters who are alive and well.

### Medical investigations

Gabriel's medical investigations reveal:

- EKG: no significant abnormalities other than a premature ventricular contraction
- Urinalysis: 11 white cells to 20 white cells and 11 red cells to 20 red cells with heavy bacteria
- Hemoglobin: 130 g/L
- White blood cell:  $12.3 \times 10^9/L$  cells
- Platelets:  $254 \times 10^9/L$  cells
- Liver function test: normal
- Kidney function and electrolytes: normal
- Chest (posterior-anterior) and lateral:
  - heart not enlarged
  - tortuosity of the thoracic aorta
  - chronic pleural and parenchymal abnormalities are seen in the right hemithorax

### Physical examination

Gabriel's physical examination indicates the following:

- BP: 152/90 mmHg
- Pulse rate: 94 bpm
- Respiratory rate: 24 breaths per minute
- Chest exam: single crepitations and wheezing over the right side



Figure 1 A. Chest x-ray: antero-posterior view.



Figure 1 B. Chest x-ray: lateral view.

- area of increased density in the right base laterally. This appears to be in the middle lobe
- left lung (Figures 1 A and B): clear
- Cervical spine x-ray: lucency in the C5 cervical vertebrae
- CT scan of chest (Figure 2): extensive pleural parenchymal scarring with calcification in the right hemithorax. A tumour mass is noted in the right lower lobe, with associated volume loss
- CT scan of abdomen (Figure 3): metastatic disease to the liver and left kidney
- Bone scan (Figure 4 A and B): several skeletal abnormalities are identified
- Pelvis x-ray (Figure 5): a large lytic lesion is seen involving a right superior and inferior pubic ramus with virtually complete destruction of the superior pubic ramus

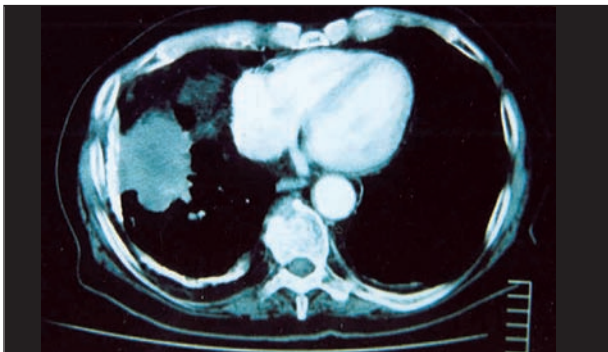


Figure 2. CT scan of the chest.

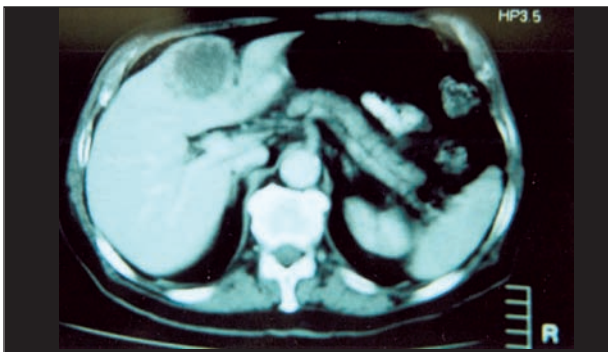


Figure 3 A. CT scan of abdomen shows metastatic disease of the liver.



Figure 3 B. CT scan of the abdomen shows metastatic disease of the left kidney.

### *What's your diagnosis?*

- a) Right mesothelioma with multiple metastases to different organs and bones
- b) Right mesothelioma with multiple metastases to different organs and bones with right-side pneumonia
- c) Bronchogenic carcinoma in the right lower lobe with multiple metastases to different organs and bones, presumably related to asbestos pleural disease

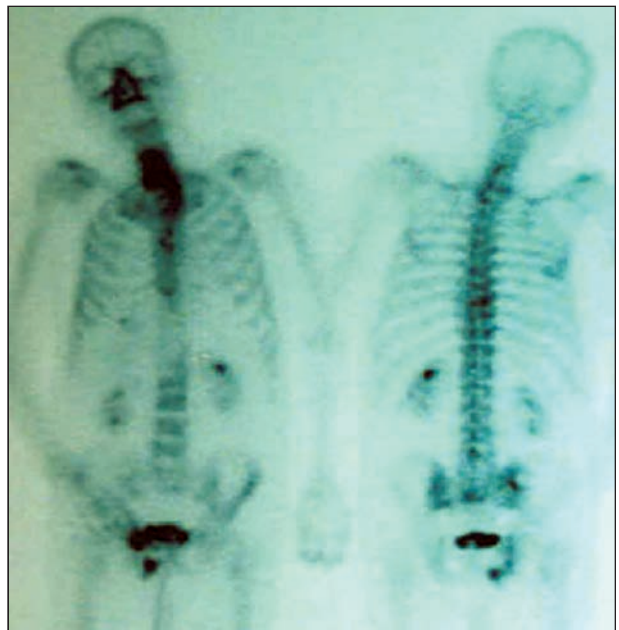


Figure 4 A. Bone scan. A number of skeletal abnormalities are identified.



Figure 4 B. Bone scan.



Figure 5. Pelvis x-ray. A large lytic lesion is seen involving a right superior and inferior pubic ramus with virtual complete destruction of the superior pubic ramus.

### Answer: C

*Bronchogenic carcinoma in the right lower lobe with multiple metastases to different organs and bones, presumably related to asbestos pleural disease.*

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## Asbestos complications

Asbestosis is a pneumoconiosis caused by the inhalation of asbestos fibers. The risk of asbestos-related abnormalities and disease increases with increasing levels and the duration of exposure. The spectrum of asbestos-related thoracic diseases includes:

- benign pleural effusion,
- pleural plaques,
- diffuse pleural thickening,
- rounded atelectasis,
- asbestosis,
- mesothelioma and
- lung cancer.

All histologic types of lung cancer may be seen. However, some studies show a preponderance of adenocarcinoma.

## Mesothelioma

Mesothelioma is a malignant pleural or peritoneal tumour that rarely occurs in patients who have not been exposed to asbestos. Mesothelioma tends to appear late and is usually associated with an extremely poor prognosis. The median survival is  $\leq 10$  months and most patients die within two years. Bronchogenic carcinoma is estimated to develop in 20% to 25% of heavily exposed asbestos workers. Smoking has a cumulative effect, further increasing the risk of lung cancer to a factor of 90 vs. a factor of five in exposed non-smokers. Often, asbestos-related interstitial disease is associated; however, no correlation exists between the severity of asbestosis and the development of lung cancer.

## Treatment

No treatment for asbestosis is effective. The primary strategy is prevention, with the worldwide elimination of asbestos use and with the replacement of asbestos by safe synthetic products. **Dx**