

## **A MIDDLE-AGED MAN WITH A HISTORY OF RENAL CELL CARCINOMA**

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### ***Abstract***

A 56 year old man was seen with a lung nodule. He had an extensive past medical history including renal cell carcinoma, congestive heart failure, obstructive sleep apnea and a 135 pack-year history of smoking. His physical examination was consistent with congestive heart failure. Sputum cultures for bacteria, fungi and tuberculosis were all negative. A CT scan revealed a spiculated, noncalcified 2.1 mass in the right lower lobe. PET scan showed the lesion to have a standard uptake value of 1.5. The lesion was followed and after 3 months had enlarged to 6.4 cm. Biopsy was done and consistent with a lung abscess. Conservative therapy resulted in resolution only to have the lesion recur 22 months later with the patient expiring from massive hemoptysis and respiratory failure. This case illustrates the usefulness of doubling time in separating benign from malignant lung lesions.

### ***Case Presentation***

#### *History of Present Illness.*

A 56 year old man was seen in pulmonary consultation because of a right lower lobe mass discovered incidentally during a CT scan for pulmonary embolism. He was admitted to the Phoenix VA with complaints compatible with congestive heart failure. He had an extensive PMH with multiple myocardial infarctions with stent placements; resultant congestive heart failure; obesity; type 2 diabetes mellitus; obstructive sleep apnea, a 135 pack-year history of smoking; and right renal cell carcinoma found incidentally in 2006 with subsequent right nephrectomy 2 years previously.

#### *Physical Examination*

The patient was a tall, obese man who was afebrile. Bilateral rales were noted about half way up the lung fields bilaterally and 2+ pretibial edema. The remainder of the physical examination was unremarkable.

#### *Laboratory Findings*

Urine analysis, complete blood count, and basic metabolic panel had the following abnormalities and pertinent negatives: hemoglobin 11.0 g/dl; hematocrit 31.9%; WBC

8200 cells/microl; creatinine 1.9 mg/dl; BUN 41 mg/dl; glucose 200 mg/dl. Hemoglobin A1C was 8.9% and a brain natriuretic peptide was 887 pg/ml. Arterial blood gases were PaO<sub>2</sub> 82 mm Hg, PaCO<sub>2</sub> 25 mm Hg and pH 7.44 while breathing room air. Sputum cultures for bacteria, fungi and tuberculosis were negative. Serology testing for *Coccidiomycosis* was negative.

### *Radiography*

The admission chest x-ray is shown in Figure 1.

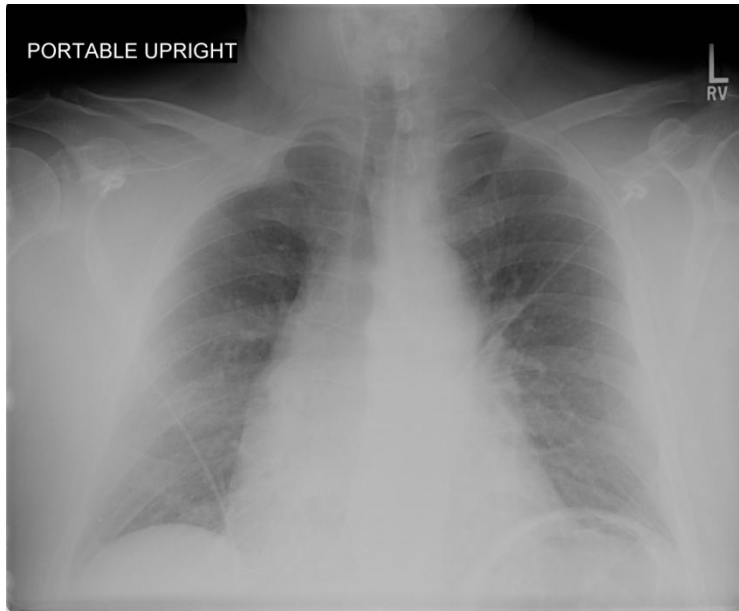


Figure 1. Admission chest X-ray.

A representative slice of the CT scan showing the right lower lobe mass is shown in Figure 2.

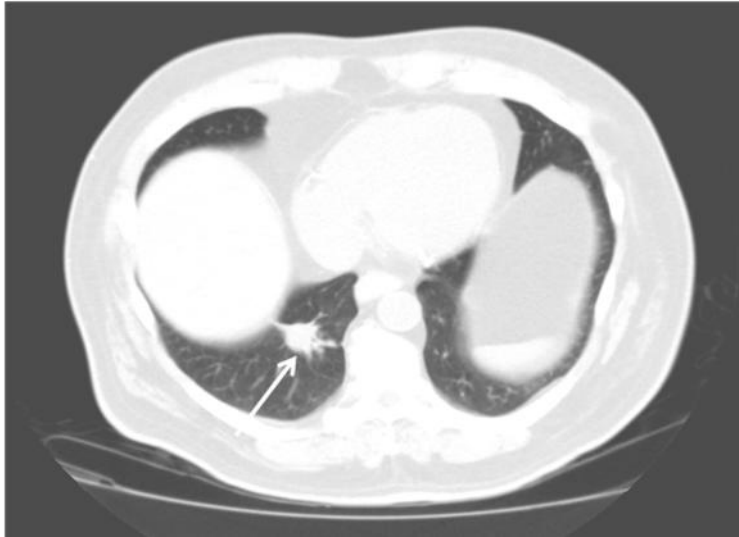


Figure 2. Chest CT showing noncalcified, spiculated 2.1 cm nodule in the right lower lobe indicated by the arrow.

A PET scan was performed and the lesion had a standard uptake value of 1.5.

#### *Subsequent Course*

Multiple diagnosis including lung cancer, metastatic renal cancer, and infection were considered. The patient was reluctant to undergo biopsy but agreed to an outpatient course of doxycycline and a repeat CT scan 3 months later (Figure 3).

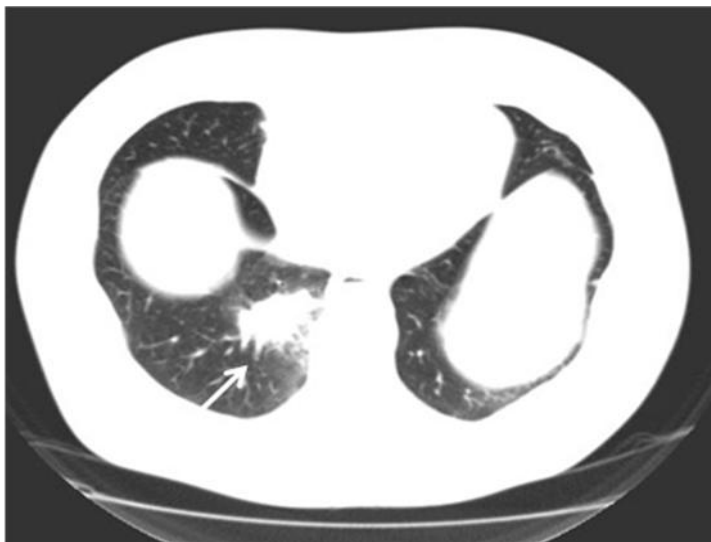


Figure 3. Repeat CT scan done 3 months later showing enlargement of the right lower lobe mass to 6.4 cm indicated by the arrow.

The patient was agreeable to needle biopsy (Figure 4).

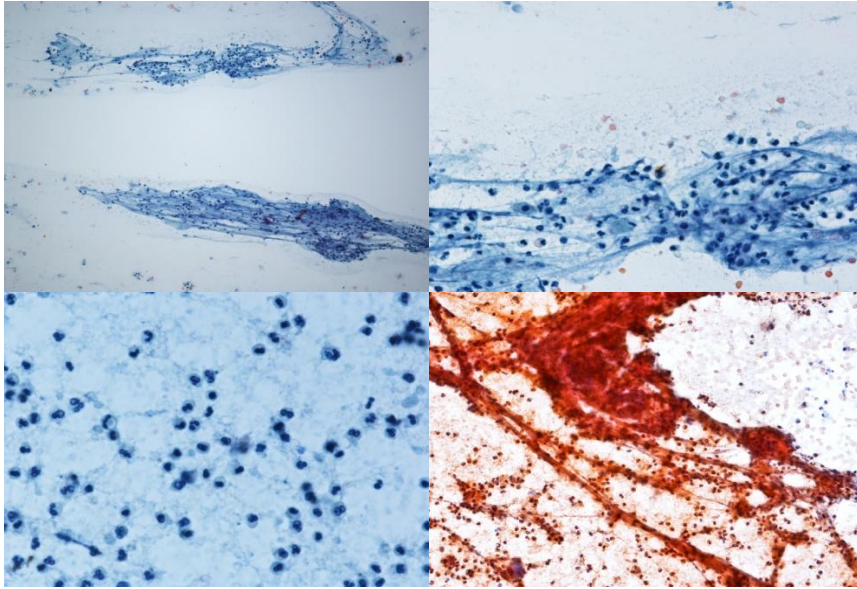


Figure 4. Needle aspiration of lung mass showing an absence of malignant cells with acute inflammation compatible with a lung abscess.

Gastroenterology consultation was obtained and esophageal motility and esophogastroduodenoscopy revealed only gastritis.

The patient was followed and a repeat CT scan done 3 months later revealed shrinkage of the lesion (Figure 5).

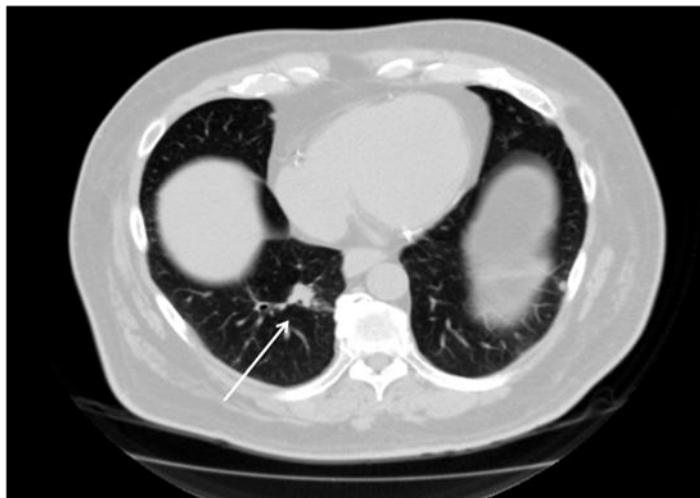


Figure 5. CT scan done 6 months after biopsy (9 months after original CT scan). The right lower lobe lesion appears smaller at 1.2 cm.

The patient was followed and was asymptomatic until 22 months after initially seen when he presented with hemoptysis and shortness of breath. Repeat CT scan again

showed a lesion in the area of the original lesion with cavitation and an air fluid level (figure 6).

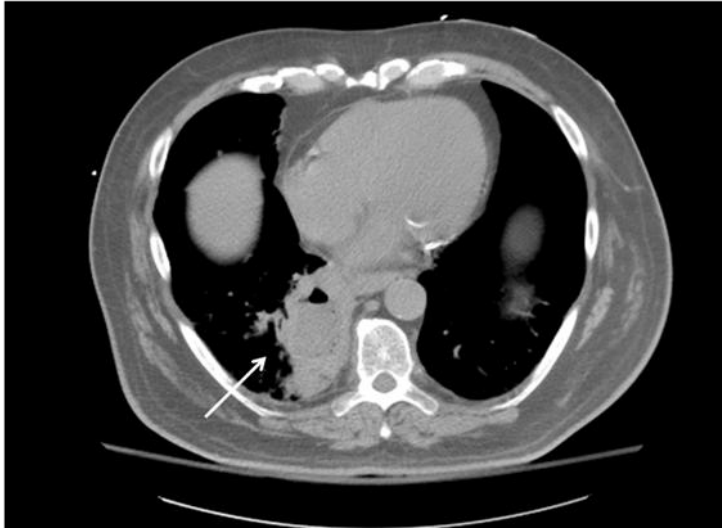


Figure 6. CT scan done 22 months after original CT scan showing cavitation and an air fluid level indicated by the arrow.

Bronchoscopy with bronchoalveolar lavage was performed. Cultures for bacteria, fungi and tuberculosis were negative. He subsequently died from massive hemoptysis and respiratory failure.

### ***Discussion***

This case demonstrates the usefulness of doubling time in separating malignant from nonmalignant chest lesions. Between his first and second CT scans this patient's lesion had enlarged from 2.1 to 6.4 cm over 102 days giving a calculated doubling time of 21 days (1). Lung cancers generally have average doubling times of about 100 days but have been reported to vary between 30 and 500 days. Doubling times of < 30 days usually indicate an infectious process. The lesion was aspirated because of its growth but no organism was identified. However, doubling time may occasionally be difficult to determine when nodules are not spherical or the borders are particularly vague such as in ground glass opacities or semi-solid lesions.

Narrowing the initial cause of this lung lesion was difficult because of the multiple potential causes including lung cancer, infection, pseudotumor and metastatic renal cell carcinoma. PET scans are usually positive in lung cancers. Negative PET scans have been reported with renal cell carcinoma although in the minority of instances (2). PET scans may be variably positive in pulmonary infections (3). However, the low uptake on PET scanning suggested the lesion was not malignant. Furthermore, the rapid growth

combined with the low metabolic uptake also suggested the lesion is not malignant because growth of malignant stage I lung cancers and metabolic activity on PET scanning usually correlate (4).

The infectious cause of this patient's right lower lobe abscess was never identified despite repeated sputum cultures, bronchoscopies and even a needle aspiration biopsy. Despite the negative evaluation for esophageal dysmotility, it seems most likely that aspiration caused with a subsequent anaerobic abscess was the cause of his lesions. Anaerobic organisms can be difficult to culture (5,6). The patient repeatedly denied any difficulty swallowing, water brash, etc.

It is unclear whether the original lesion identified was the same as the subsequent cavity with an air fluid level. Although progressive pneumonia can occur with aspiration, we suspect repeated aspiration as the subsequent cause of his cavity because of the improvement followed by the worsening 22 months after the initial presentation (5). However, prevention of aspiration may be difficult and it is unclear what measures could have been invoked to prevent his eventual demise.

### ***References***

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