Pulmonary Cryptococcal Infection Mimicking Primary Lung Cancer

Stephanie Griffith, MD and Hataya Poonyagariyagorn, MD

PROVIDENCE St. Vincent Medical Center

INTRODUCTION

Discovery of solitary pulmonary nodules or masses are a common clinical occurrence.

Subsequent investigation is based on the likelihood of malignancy and can be difficult and stressful for providers and patients to navigate

HISTORY

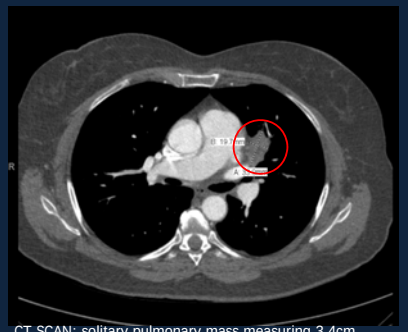
- 57 year old woman presented to the ED with sudden onset substernal chest pain and dyspnea while at rest. The pain was characterized as sharp, radiating to her back, and associated with nausea, diaphoresis and leg weakness. The symptoms resolved after 10 minutes.
- Past medical history included hyperlipidemia & anxiety
- Family history significant for cardiovascular disease
- Rare alcohol use. Never smoker. No asbestos or TB exposure. Has lived in CO, ID, CA & OR. Has dogs, cats and chickens at home

Objective data:

- Vital signs and physical exam were normal.
- Labs: Slight increased glucose and AST. Troponin neg.
- EKG showed non specific T wave changes.
- Chest radiograph revealed mild left hilar prominence
- CT pulmonary angiogram revealed a 3.4 x 2 x 2.2cm mass in the lingula of the left upper lobe, concerning for lung carcinoma

Additional evaluation:

- PET scan revealed high FDG uptake in the lesion
- Bronchoscopy was non diagnostic and final diagnosis was made by left upper lobectomy



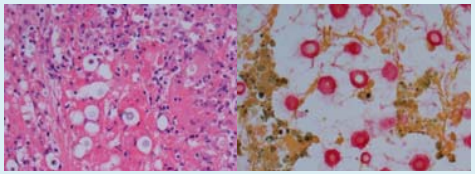
CT SCAN: solitary pulmonary mass measuring 3.4cm with slightly lobulated borders

FDG-PET: metabolically active tissues take up the tagged glucose analog (FDG) and thus, have higher PET avidity, corresponding with a brighter color. In general, SUV >2.5 Is concerning for malignancy

PET SCAN: Left lingula mass with maximal standard uptake value (SUV) of 8.44

DIAGNOSIS AND DISCUSSION

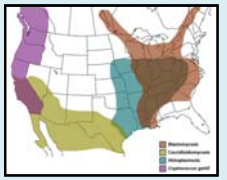
- Our patient presented with chest pain and was found to have a pulmonary mass concerning for malignancy, that in fact was a cryptoccocal infection
- Pre-test probability of malignancy was 51-62% based on Brock and Mayo prediction models, prompting PET/CT and an expedited workup
- Although non cancerous tissues can be metabolically active and cause increased FDG uptake, the SUV value of this lesion was exceptionally high for a benign mass
- The location of the mass made safely obtaining tissue biopsy by less invasive means challenging. This ultimately lead to a left upper lobectomy, which was both diagnostic and definitive therapy
- Cryptococcosis is an invasive fungal infection caused by Cryptococcus neoformans or C gattii, and pulmonary infections can present in any lung zone and in a wide variety of patterns
- C neoformans primarily causes disease in immunocompromised hosts but asymptomatic cases are reported in immunocompetent hosts.
- C gattii is increasingly recognized as a cause of disease in healthy hosts, and sixty cases were reported in the Pacific Northwest between 2004-2010
- C gattii is more likely to cause larger CNS and pulmonary lesions called cryptococcomas than C neoformans
- FDG avidity varies widely in cryptococcal lung infections making use of PET/CT in endemic regions problematic



LEFT: clear capsule surrounding clear blue nucleus on H and E staining. **RIGHT**: Mucicarmine Stain zone of clearance or "halo" around the cells. Consistent with cryptococcus sp.

SUMMARY

- This case highlights the difficulties faced when a pulmonary mass is discovered and must be evaluated for malignancy
- Size greater than 3cm, irregular borders, upper lobe location, advanced age and significant smoking history increase pre test probability of malignancy
- FDG-PET is superior to CT in evaluation of a mass and likelihood of malignancy increases with FDG avidity, but interpretation is limited as non malignant metabolically active tissues can have a high FDG uptake as well
- Tissue diagnosis is essential and in difficult cases such as this one, a wedge resection or lobectomy may be necessary for diagnosis, while also sufficient for treatment
- C neoformans and C gattii can cause disease in healthy hosts and C gattii is now endemic in the Pacific NW and Canada and can mimic malignancy
- This case emphasizes the importance of considering infectious and inflammatory etiologies of lung masses, even when FDG avidity is high and malignancy seems almost certain



REFERENCES

-Song, K. D. Pulmonary Cryptococcosis: Imaging Findings in 23 Non-AIDS Patients. *Korean Journal of Radiology*.
-Chung-Jen Huang (2009) Characteristics of Integrated 18F-FDG PET/CT in Pulmonary Cryptococcosis, Acta Radiologica, 50:4, 374-378
-Calcagni, M. L. Diagnostic Performance of 18F-Fluorodeoxyglucose in 162 Small Pulmonary Nodules Incidentally Detected in Subjects Without a History of Malignancy. *The Annals of Thoracic Surgery*.
-Galanis, E. Epidemiology of Cryptococcus gattii, British Columbia, Canada, 1999–2007. *Emerging Infectious Diseases*.