

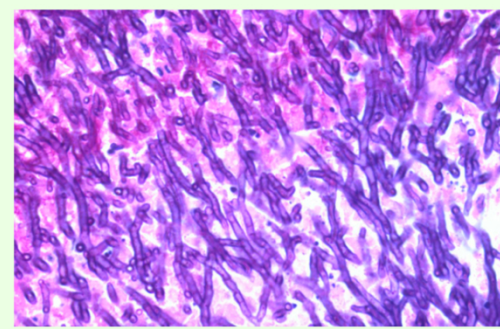
Introduction

- Aspergillus* is a fungal species found in decomposing plant materials that infects humans through inhalation of spores¹
- Chronic pulmonary aspergillosis (CPA) is typically seen in individuals with some underlying pulmonary disease and has been underdiagnosed due to nonspecific manifestations of disease^{1,2}
- Tuberculosis (TB) is the most common underlying condition in those with CPA. Table 1 lists other associated conditions³⁻⁵
- Prevalence of CPA is <1 in 100,000 in the United States in cases associated with TB⁶
- CPA typically presents within multiple cavities. Less common presentations are *Aspergillus* nodules and simple aspergillomas^{1,7}
- Simple aspergilloma is more likely to be asymptomatic than other forms of CPA^{3,8}
- Aspergillomas mimic other lesions on imaging and can only be confirmed through biopsy.⁷ Figure 1 shows example histology
- Some symptoms of CPA include hemoptysis, cough, fatigue, and weight loss¹
- In a retrospective study including 60 patients, incidence of life-threatening hemoptysis was similar between asymptomatic and symptomatic groups and could not be predicted by other means³
- Complications of CPA include progression to fatal hemorrhage, pulmonary fibrosis, or invasive pulmonary aspergillosis^{1,9}
- CPA may be considered a high mortality disease¹⁰

Table 1. Associated underlying pulmonary disease⁴

Tuberculosis
Non-tuberculosis mycobacterial infection
COPD (emphysema type)
Pneumothorax
Previous lung cancer
Pneumonia
Allergic bronchopulmonary aspergillosis with or without asthma

Figure 1. *Aspergillus* hyphae under microscope¹²



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4184241/figure/fig1/>

Case Description

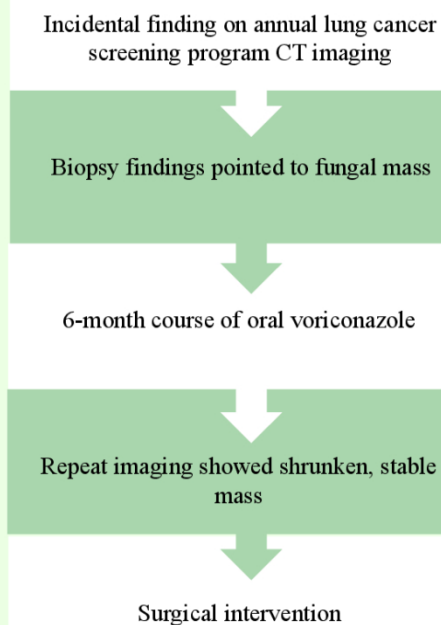
Brief History

- 54-year-old Caucasian male presented to surgical team with asymptomatic lung nodule
- Figure 2 describes the course of illness
- PMHx: emphysema, hypertension, atrial fibrillation, type 2 diabetes mellitus
- Medications: losartan 100 mg PO daily, metformin 500 mg PO daily, metoprolol succinate XL 25 mg PO daily
- Allergies: penicillin (rash), latex (unknown)
- PSocHx: 100-pack-year cigarette smoking history (quit in 2019), 2-3 alcoholic drinks per week, no recent travel, retired baseball umpire
- Family Hx: Mother/father (living) with coronary artery disease
- Review of systems all negative

Objective Findings

- Physical exam:
- Vital signs: BP 153/78 mmHg, HR 88 bpm, Temp 98°F, SpO₂ 99% on room air
 - General: A&Ox3, no acute distress
 - Respiratory: breathing non-labored, lung sounds present bilaterally and clear on auscultation
 - Heart: S1/S2 present, no murmurs/rubs/gallops
 - Extremities: no edema, full active ROM, strength 5/5
- Labs:
- WBC 7,000 per mm³
 - Hemoglobin A1C 7.1%

Figure 2. Course of illness



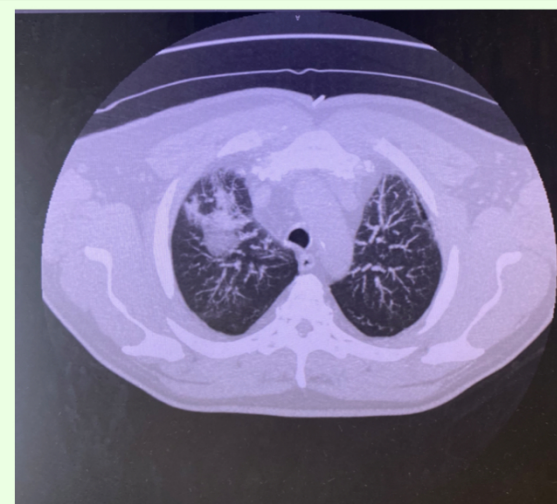
Differential Diagnosis

- Inflammatory lesion
- Infection
- Malignancy

Diagnostic Testing

- Low dose CT scan showed right side lung nodule (1.8cm x 1.3cm) with inflammation (Figure 3)
- PET scan showed avidity at nodule
- CT-guided biopsy of nodule showed fungal hyphae
- Pulmonary Function Testing showed mild air trapping
 - FEV₁/FVC = 69%
- 3 month follow-up CT showed shrunken nodule (1.2cm x 0.8 cm)
- 6 month follow-up CT showed stable nodule without diffuse inflammation

Figure 3. Computed tomography of aspergilloma



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Outcome

- A 6-month course of voriconazole 200mg PO BID did not eradicate the mass
- Patient was determined to be a good candidate for thoracic surgery via pulmonary function testing
- Underwent a video-assisted right upper lobe wedge resection with needle localization and intra-operative IV voriconazole
- Pathology showed an aspergilloma with clear margins
- Patient discharged from hospital on POD#2 without oral antifungal therapy

Discussion

- General recommendation for initial therapy of CPA is 4-6 months of oral antifungal therapy with follow-up imaging every 3 months⁷
- Recurrence is common following discontinuation of medical therapy⁷
- Oral itraconazole and voriconazole are the preferred agents with associated side effects of hepatitis, neuropathy, GI upset^{5,11}
- No current research to compare efficacy of the two drugs or efficacy in different CPA manifestations⁷
- The patient had suboptimal response to 6 months of oral antifungals and the decision was made to pursue surgical intervention
- Surgical resection is an often curative option for those who are candidates with low risk of mortality and recurrence with single aspergilloma⁵
- Intra-operative and postoperative antifungal use may be considered in the setting of fungal spillage but is poorly defined in the guidelines^{7,11}
- In a study following 60 patients with aspergilloma, medical therapy was mostly non-curative and early surgical resection had better outcomes than resection following a period of disease progression³

Conclusion

- CPA is usually seen in patients with underlying pulmonary disease
- Prevalence of CPA is poorly defined despite the dangerous sequelae of the illness
- Current literature does not sufficiently investigate different management options for varied manifestations of CPA
- Surgical resection is a viable, and possibly superior, management option in patients with single aspergilloma