A Case of Atypical Dense Pulmonary Opacity on Chest Radiography Concerning for Malignancy vs Abscess

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OBJECTIVES

- To describe the presentation of a case of pulmonary abscess, an unusual complication of untreated pneumonia.
- To demonstrate the need for a strong fund of medical knowledge to differentiate between pulmonary abscess and other similarly-presenting clinical conditions.
- To document the successful treatment of pulmonary abscess, given that it is poorly described in existing literature compared to treatment of other pulmonary pathologies.
- To describe the potential opportunity for using Osteopathic Manipulative Treatment (OMT) in treating pulmonary abscess.

INTRODUCTION

- Pneumonia is a common illness afflicting aging adults for various reasons, including impaired gag reflex, waning immunity, decreased mucociliary function, and cardiopulmonary dysfunction.[1]
- While common organisms infect most patients suffering from pneumonia, a subset of the population remains at increased risk for infection with atypical organisms that may cause vague, systemic symptoms.[2]
- Radiographic visualization of the infiltrate in the clinical context of the patient's presentation is considered the gold standard of diagnosis.[2]
- Occasionally, a chest x-ray (CXR) cannot sufficiently demonstrate an infiltrate, or findings seen may require further characterization through computerized tomography (CT).
- If untreated, pneumonia can progress to form a pulmonary abscess over weeks to months. This uncommon complication occurs when necrosis of the tissue infected with pneumonia causes a local pocket of purulence, often with air-fluid levels.[2]
- The development of a pulmonary abscess results in a worsening of the initial infection, with radiographic findings that may concern the practitioner for more serious conditions, including malignancy or pulmonary embolism (PE).

CASE REPORT

- A 63-year-old prediabetic, though otherwise healthy, male presented to the ED complaining of productive cough with white, green, and yellow sputum for four months after sitting next to a man who was coughing vigorously at a celebration of life ceremony.
- In the days prior to his presentation his partner noted concern over his significantly increased dyspnea and fatigue, prompting him to seek evaluation.
- He noted associated worsening fever with chills and nocturnal diaphoresis to where his sheets were soaked through.
- He denied any chest pain, abdominal pain, nausea, vomiting, hemoptysis, hematemesis, diarrhea, or constipation. Additionally, he denied significant recent weight loss.
- Review of systems was otherwise negative.
- Past surgical history was noncontributory. He takes no daily medications and has no allergies. He is a retired high school basketball coach, never a smoker, and never a drug user.

CLINICAL COURSE

Physical Exam:

- Vitals: 102.7 °F - 114 bpm - 18 rpm - 98% RA.
- Constitutional: Well-appearing, appeared stated age, in no acute distress.
- Cardiovascular: Tachycardic with no murmurs, rubs, or gallops.
- Pulmonary: Decreased breath sounds with slight rhonchi in the right upper lung field without wheezes, accessory muscle usage, or tachypnea. No reproducible chest wall tenderness.
- Gastrointestinal: Abdomen soft, nondistended, and nontender.
- Osteopathic: Chronic tissue texture changes from T2-T7 bilaterally.[3]
- The remainder of his examination was grossly unremarkable.

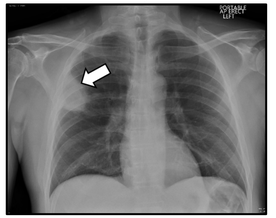
Differential Diagnosis:

- Pneumonia, tuberculosis, malignancy, CHF, PE, ACS, pneumothorax, tamponade, myocarditis, electrolyte abnormalities, costochondritis, Mallory-Weiss, Boerhaave syndrome.

Initial Labs and Imaging:

- CXR, COVID-19 swab, influenza A/B swab, CBC with diff, CMP, lactic acid, PT/INR, hsTn, BNP.

Test	Result
WBC	15.5 x1000/mcL (4.0-11.0 x1000/mcL)
Hemoglobin	12.6 g/dL (13.5-17.5 g/dL)
Hematocrit	37.5% (41.0-51.0%)
Na	132 mEq/L (135-145 mEq/L),
Cl	98 mEq/L (101-111 mEq/L)
K	3.4 mEq/L (3.5-5.0 mEq/L)
Anion Gap	12 mEq/L (3-11 mEq/L)
COVID-19	Positive



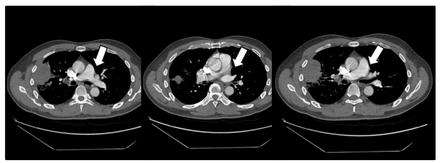
- CXR (Image 1, Above): Normal cardiac silhouette, a 5.9 cm dense opacity in the lateral aspect of the right upper lobe, and no evidence of pleural fluid.

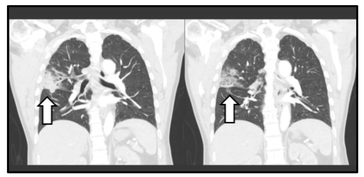
Risk Stratification:

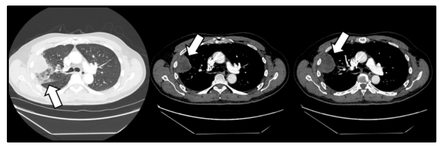
- HEART Score: 1; CURB-65 Score: 0

Additional History, Labs, and Imaging:

QuantiFERON Gold	Parainfluenza Virus 1	Respiratory culture
AFB cultures	Parainfluenza Virus 2	Legionella pneumophila urinary antigen
Blood cultures	Parainfluenza Virus 3	Streptococcus pneumoniae urinary antigen
Adenovirus	Parainfluenza Virus 4	Cryptococcus species antigen
Human Coronavirus 229E, HKU1, NL63 + OC43	Respiratory Syncytial Virus Type A	Staphylococcus aureus screening culture
Human Metapneumovirus	Respiratory Syncytial Virus Type B	MRSA surveillance culture
Enterovirus/Rhinovirus	Chlamydophila pneumoniae	HIV antigen
Influenza Virus A	Mycoplasma pneumoniae	HIV 1+2 antibody
Influenza Virus B	Coccidioides immitis IgG	**Procalcitonin 0.20 ng/mL (H) (0.00-0.06 ng/mL)**
SARS-COV-2	Coccidioides immitis IgM	







- CTA Chest (Images 2-9, Above): No central or segmental PE, though there was a large 6 cm heterogeneous mass-like consolidation in the peripheral right upper lobe, likely representing infection/developing abscess in the acute setting with presenting symptoms of fever. Neoplasm could not be excluded, as there were enlarged right hilar lymph nodes deemed nonspecific and indeterminate.

DISCUSSION

- While many causes of pneumonia can be isolated through a respiratory panel, urinary testing, or blood cultures, a source is often not easily defined in the setting of pulmonary abscess.
- Pulmonary abscesses are often caused by mixed populations of bacteria, requiring broad coverage including anaerobes.[2]
- In the case of this patient, it is not surprising that a single organism was not isolated.
- While there was initial concern for malignancy given the CXR, the CTA was far more convincing for pulmonary abscess, given the heterogenous appearance of the lesion with internal soft tissue density and fluid density components, anterior loculated gas, surrounding ground glass opacities, and surrounding mucous plugging.
- Despite viscerosomatic changes from T2-T7, supporting pulmonary pathology, OMT was deferred after careful consideration due to the relative contraindication of potential malignancy in the setting of a lung lesion with unknown potential metastases/seeding.

CONCLUSION

Disposition:

- The patient was admitted to hospitalist (MOD) for sepsis in setting of abnormal pulmonary imaging.
- The patient was started on a discharge, bolus, vancomycin, ceftriaxone, and doxycycline in the ED and transitioned to ampicillin-sulbactam while inpatient.
- At discharge, the patient was placed on six weeks of amoxicillin-clavulanate and instructed to follow up with his PCP in four weeks.
- A repeat CXR was ordered at follow-up, but the patient never had it performed. However, the patient reported complete resolution of symptoms at that time with near-completion of antibiotic therapy.

Conclusions:

- This case is an excellent example of the need for thorough history-taking and keeping a broad differential diagnosis.
- Treatment of pulmonary abscess is poorly described in existing literature.
- While OMT was deferred in this patient, in the absence of malignancy it would have been reasonable to perform as an adjunct to pharmacologic therapy during the patient's ED course and hospital admission.

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REFERENCES

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