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CLINICAL VIGNETTE

The Importance of Radiographic Follow-Up

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Clinical Case

An 84-year-old woman presents complaining of cough. She reports a productive cough with yellow-colored sputum for the past 2 weeks. She also notes occasional wheezing and hoarseness. She denies sore throat, nasal congestion, rhinorrhea, fevers or chills. She denies recent travel but reports her son and friend with similar symptoms were diagnosed with acute bronchitis. She received both pneumonia and flu vaccines earlier this year. Her past medical history is significant for poorly controlled hypertension, stage 3 chronic kidney disease, sick sinus syndrome with pacemaker placement and polymyalgia rheumatica, which has been stable on low dose prednisone. She was recently taken off lisinopril and hydrochlorothiazide due to hyperkalemia, and switched to low dose amlodipine which has caused mild bilateral ankle swelling. She denies any history of pneumonia. Current medications include daily amlodipine 2.5 mg, aspirin 81 mg, calcium/vitamin D, fish oil, metoprolol and prednisone 1 mg. She is widowed and lives alone. She denies prior smoking, alcohol or illicit drug use.

Vital signs included blood pressure 160/72, pulse 62, temperature 36.3C and oxygen saturation of 96% on room air. She was comfortable with moist mucus membranes, clear oropharynx and nasal turbinates, scattered expiratory rhonchi more pronounced in right lung without rales. She has a soft systolic murmur heard best over right upper sternal border, symmetric distal pulses and 2+ bipedal edema symmetrically.

Chest x-ray showed a new focal, 3.5 cm rounded opacity in the left upper lobe with increased ill-defined linear opacities in the right lower lobe, which were suggestive of an infectious process. Radiology recommended follow up to ensure resolution.

Given patient's overall clinical picture with acute productive cough and opacity on chest x-ray, a diagnosis of community-acquired pneumonia was made and she was prescribed a 10-day course of amoxicillin/clavulanate and prn inhaled albuterol. Close follow up with repeat imaging to ensure resolution of her lung opacity was emphasized.

She returned a month later feeling much better. Her cough resolved and her breathing was back to normal after completing antibiotics. Her exam showed elevated blood pressure of 154/82 with lungs clear to auscultation bilaterally. Repeat chest x-ray showed the opacity in the left upper lobe and ill-defined density in the right lower lobe, unchanged from previous x-ray.

Chest CT showed a 32 mm left upper lobe spiculated pulmonary mass, highly concerning for primary lung carcinoma. Percutaneous CT-guided transthoracic biopsy showed moderately differentiated adenocarcinoma. Whole body PET/CT scan showed a left upper lobe FDG-avid mass without evidence of metastatic disease, radiographic stage T2aN0M0, Stage 1B. Mediastinoscopy showed no evidence of disease. Treatment options were discussed and she opted for stereotactic radiation and completed treatment of 54 Gy to the left upper lobe. Follow-up imaging documented decreased in size of the left upper lobe mass and ground glass capacity without local recurrence or metastases. She continues to be followed with periodic imaging and is now 18 months post treatment.

Discussion

Cough is one of the most common presenting symptom to outpatient clinics. Cough is categorized as acute, subacute and chronic. Acute cough occurs for less than three weeks and is usually caused by acute respiratory infections. Subacute cough typically lasts between three to eight weeks and chronic cough lasts more than eight weeks.¹ Our patient presented with an acute cough with sputum production and mild wheezing. The diagnosis of community-acquired pneumonia is generally based on clinical symptoms including cough, fever, dyspnea and sputum production and radiographic findings showing a pulmonary infiltrate. Age over 65 is a risk factor for pneumonia, with the annual incidence of hospitalization for community-acquired pneumonia around 2,000 per 100,000 in the United States. Chronic comorbidities also increase the risk for pneumonia, particularly chronic lung disease, chronic heart disease, diabetes and other immunocompromising conditions.²

Although our patient did not mount a fever, her older age and chronic comorbidities put her at increased risk for pneumonia. Given her clinical symptoms and radiographic findings, she was initially diagnosed as community acquired pneumonia. However, many of these symptoms are nonspecific and found in pulmonary edema, collagen vascular diseases, interstitial lung disease, pulmonary embolism, atelectasis, chemical pneumonitis, acute exacerbation of bronchiectasis and lung cancer. Pulmonary infiltrates due to community acquired pneumonia are caused by aggregation of white blood cells in the alveoli and can take weeks to resolve.² Because our patient's symptoms were nonspecific and her chest x-ray showed a new focal lung

opacity, it was important to have follow-up imaging to ensure resolution of the opacity.

Lung cancer is the leading cause of cancer-related deaths for men and women worldwide. About 85% of lung cancer diagnoses are non-small cell lung cancer.³ Patients who present with symptoms due to lung cancer usually have advanced disease. The most common presenting symptom is cough, followed by hemoptysis, dyspnea and chest pain. Initial imaging is usually a chest radiograph.⁴ If anything abnormal is found, it is very important to review prior chest imaging to determine the duration of the abnormality. New or enlarging focal abnormalities on chest radiograph require follow up or CT imaging. CT characteristics concerning for malignancy include size (usually greater than 15 mm), irregular or spiculated borders, upper lobe location, thick-walled cavitation or growth on follow-up imaging.⁵ Our patient's CT findings raised great concerns for malignancy and led to her diagnosis of primary lung adenocarcinoma. She received curative radiation treatment with subsequent clinical remission.

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