

Abstract Form

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Project Title:	Advanced Lung Cancer in A Young Non-smoker		
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Abstract

Introduction: For patients who have never smoked, prevention and early detection strategies are unclear. Only 0.2% of patients who develop invasive lung cancer are 49 or younger. Approximately 9% of male patients with lung cancer are never-smokers. Early identification of lung cancer is challenging. There are rarely red-flag symptoms in early-stage lung cancer, and the disease is generally not a concern for young people who have never been smokers. When red flag symptoms such as respiratory distress or hemoptysis present, the disease has often already progressed to a late stage malignancy.

Case Report: A 28-year-old Hispanic nonsmoking man who presented to the emergency department following seven months of progressively worsening dyspnea and right chest pain. The patient’s chest pain radiated to his upper back and was aggravated by coughing, deep inspiration, supine positioning. Dyspnea was present upon minimal exertion and even worsened when speaking. One month prior to presentation, the patient was hospitalized after a CXR finding of diffuse bilateral infiltrates (R>L). He was briefly admitted for treatment of community acquired pneumonia and completed a course of antibiotics; however, symptoms continued to progress. Since his discharge, the patient reported intermittent hemoptysis with progressively increasing frequency. The patient immigrated from Guatemala to California approximately two years prior to presentation. He also reported an extensive travel history including El Salvador, Honduras, Colombia, and Costa Rica. While living in Guatemala, he worked as a cleaner, cook, radio host, and at a gas station for three years. He reported frequently using a wood fire-pit/stove to cook. Since moving to California, he has worked as a construction worker. His job involved framing, insulation, and laying underground cables which required him to dig underground. The patient endorsed consistent use of a respirator while working. He denied smoking tobacco, e-cigarette, marijuana or vaping in the past. On exam, he was afebrile, HR 98, RR 24, BP116/82, SpO2 98% on 4L NC. He was alert, diaphoretic, diffuse crackles in all lung fields bilaterally. Cardiovascular exam revealed no murmurs, gallops, or jugular vein distention. Extremities were without distal pitting edema, clubbing, or cyanosis. Other exams were unremarkable. Labs showed a WBC count of 11.0 with 80.9% of neutrophils with no increase in eosinophils, CMP was normal. Infectious workup was negative for HIV, SARS-CoV-2, influenza, RSV, AFB, Quantiferon, coccidioides antibody, Histoplasma Ag, 1,3-D-beta-glucagon, viral panel, mycoplasma and chlamydia. Procalcitonin was 0.03. CTA was significant for diffuse bilateral infiltrates consistent with edema and/or pneumonia including bacterial, viral or atypical pneumonia, dense right lung consolidation and/or mass density, and evidence of mediastinal and right hilar and paratracheal adenopathy and/or consolidation. On day 5 of admission, patient’s respiratory status was worsening. Patient was transferred to the ICU. Patient stated he was experiencing worsening dyspnea and pleuritic chest pain. He appeared less arousable than the prior day. Patient was intubated and bronchoscopy was performed. The results of transbronchial biopsy demonstrated pulmonary adenocarcinoma with lymphangitic carcinomatosis, and atypical cells were seen on the bronchoalveolar lavage. AFB and GMS-PCP markers were both negative. The transbronchial biopsy atypical cells stained positive for CK7, TTF-1, ROS1 and negative for P40. Liquid biopsy showed CD50 3R249S and SMAD4 R361S. Oncology was consulted. The patient was induced with two cycles of carboplatin/pemetrexed. Currently, patient is being treated with crizotinib 250 mg twice daily. Treatment goal is palliative and prolonging survival. Median Overall survival is 50 months.

Discussion: Given the patient’s age and history, including occupational exposure, the differential diagnosis focused on noncancerous causes as well as malignancies. Tuberculosis, fungal, and parasitic diseases can be confused with pulmonary malignancies, especially when the patient’s age seems to be against a lung cancer diagnosis. But his worsening clinical status prompted a more direct approach to diagnosis. The factors leading to the patient’s lung cancer are unclear, although wood burning vapor contains a number of carcinogens including benzene, formaldehyde, and polycyclic aromatic hydrocarbons. Compared with nonsolid-fuel users, predominant wood users experienced a higher risk of lung cancer (OR = 1.21; 95% CI, 1.06–1.38), with adenocarcinoma as the most frequent type in non-smokers. Prolonged or repetitive inhalation of wood fire smoke should be avoided as recommended by the American Lung Association.