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CLINICAL VIGNETTE

The Pleural-based Mass: A Case Report and Review of the Literature.

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Introduction

Exposure to asbestos is one of the most extensively studied occupational safety hazards.[1-5] Asbestos is a well-known human carcinogen to both the medical community and the general public. Its penumbra in popular culture is strongly tied to mesothelioma, presumably because this cancer is caused solely by exposure to asbestos. The reverse, however, is not true: asbestos exposure can be a causal factor in several other syndromes, the most common of which is benign pleural plaques.[3] The compromised lung is also vulnerable to bacterial and fungal superinfection. When a focal infectious pneumonitis is located adjacent to the pleura, it may lead clinicians to mistakenly suspect mesothelioma based on the radiolographic appearance of a new pleural-based mass.

The purpose of the present article is twofold: (1) to recognize that a focal, fungal pneumonitis can present as a pleural-based lung mass, mimicking mesothelioma; and (2) to avoid premature closure and misdiagnosis of mesothelioma in a patient with known asbestos exposure, prior to confirmation by tissue histopathology.

Case Report

A 79-year-old male Navy veteran with a history of asbestos exposure, chronic obstructive pulmonary disease (COPD), hypertension, dyslipidemia, and ulcerative colitis presented for evaluation of worsening exertional dyspnea over 2 weeks. The patient, who is oxygen dependent, reported worsening shortness of breath, with desaturation after walking 20 feet. He denied any fevers, chills, cough, increased sputum production, chest pain, or weight loss. The patient stopped smoking 20 years ago. He used nebulized albuterol twice daily with minimal relief of his symptoms, and was compliant with all other prescribed medications including inhaled mometasone and formoterol.

On physical examination, the patient's temperature was afebrile, with an oxygen saturation of 92% on five liters oxygen via nasal cannula. He had no cervical lymphadenopathy, and his neck veins were flat. Auscultation of the chest revealed crackles in his right lung base, but no wheezing or stridor. There was no dullness to percussion or use of accessory muscles with breathing. His cardiovascular examination disclosed normal heart sounds, without murmurs, rubs, or gallops. Laboratory studies revealed a white blood cell count of 7.8 x 103/ L, with no left shift. Chest x-ray demonstrated a large, pleural-based soft tissue mass (see below). At this point, the patient was told he might have a mesothelioma and a thoracic computed tomography (CT) was ordered.

Figure 1. Patient's chest x-ray revealing soft tissue pleural-based mass.

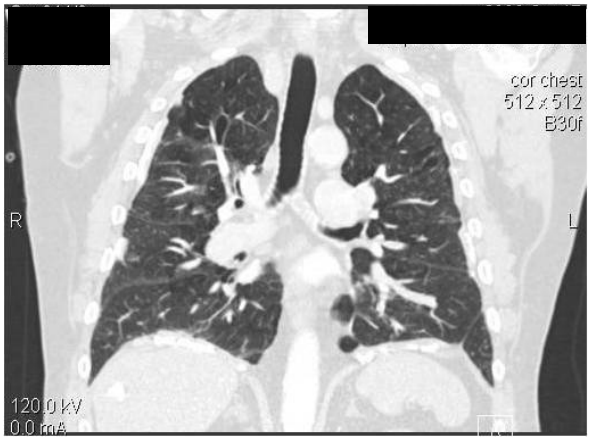

Figure 2. Chest CT with contrast, revealing diffuse lung disease and right upper-lobe mass.

The CT showed diffuse interstitial lung disease and a right upper-lobe mass that was irregularly shaped and appeared inflamed. CT-guided needle biopsy was negative for malignancy; the histopathology was consistent with pneumonitis. The biopsy sample eventually grew out Aspergillus fumigatus on fungal culture.

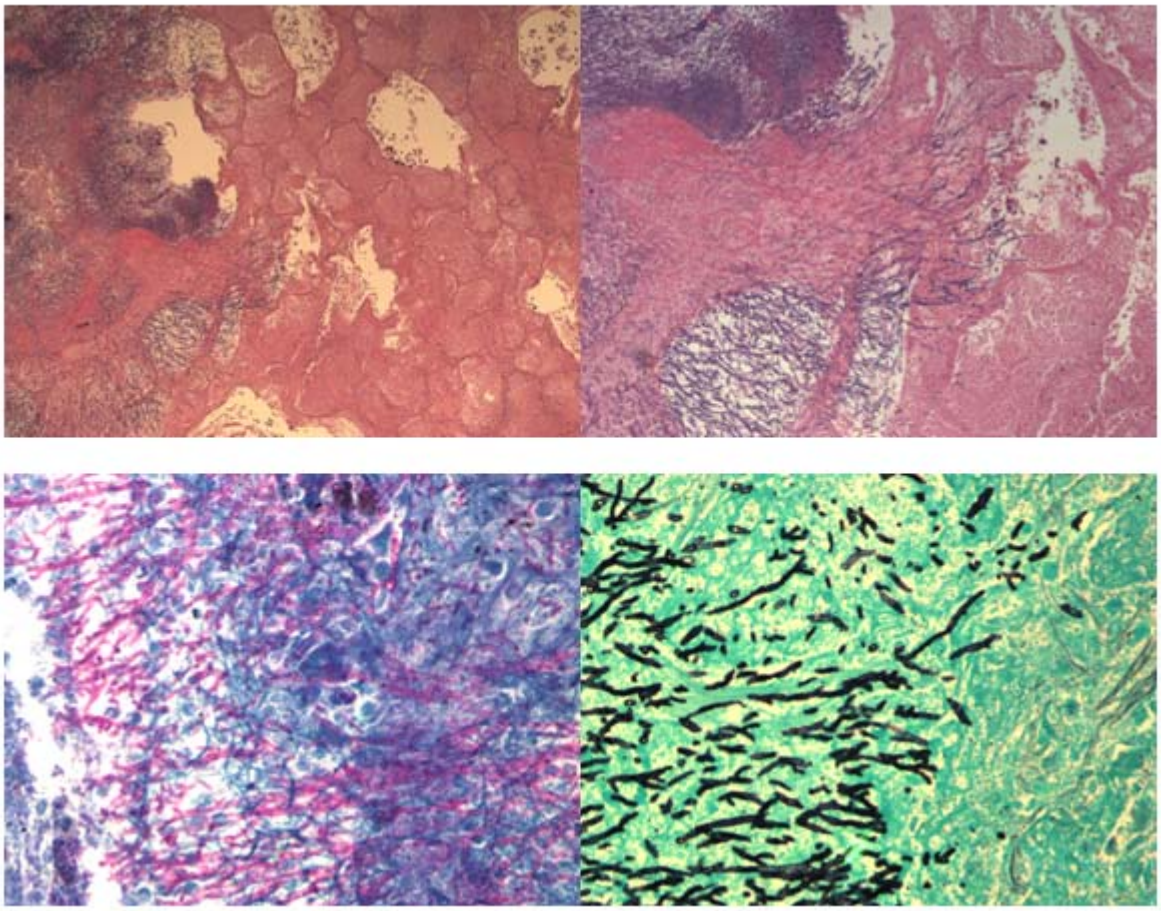

Figure 3. Clockwise from upper left: (a) Aspergillus colonies infiltrating the lung parenchyma. Note the alveoli filled with necrotic debris. (b) A high power view of slide (a) showing the ultrastructure. (c) Silver stain showing the hyphae in black. (d) The PAS stain. Note the branching at sharp angles, which is characteristic of Aspergillus.

A course of voriconazole resulted in complete resolution of the infiltrate on subsequent imaging. The patient's symptoms returned to baseline, and he was relieved to find out that he did not have mesothelioma, as initially suspected.

Discussion

Contrary to what popular culture suggests, development of a pleural-based mass following asbestos exposure is rarely an open-and-shut case of mesothelioma. As this case report demonstrates, a pleural-based mass on plain film x-ray can have multiple causes; thus, diagnosis must never rest solely on the results of imaging. The seasoned clinician should always consider a diverse range of diagnoses, and should be aware that the time between asbestos exposure and development of any of the following conditions is significant, often encompassing years or even decades.[3]

The differential diagnosis of a pleural-based opacification in a person exposed to asbestos should include the following: (1) pleural effusion, (2) local or diffuse pleural plaques, (3) rounded atelectasis, (4) infectious pneumonitis, and (5) mesothelioma. All of the above may occur in the setting of asbestosis, or lung fibrosis caused by

asbestos exposure. Pleural effusions are usually unilateral, exudative, and have a left-sided predominance.[3] Pleural plaques consist of fibrous tissue with or without calcifications. They may be circumscribed or diffuse, covering much of the parietal pleura and the superior surface of the diaphragm.[3] Plaques can easily be confused with sub-pleural fat deposits, old rib fractures, and muscle bundles on imaging. However, pleural plaques are rarely symmetrical and have an irregular border, typically developing in the lower two-thirds of the thorax.[3]

Rounded atelectasis occurs when the pleura focally thickens and pinches inward, resulting in lung compression and bronchial occlusion that renders the underlying lung airless.[3] This process gives rise to the appearance of a round, mass-like opacity originating from the pleura.

Asbestos exposure increases the lung tissue's vulnerability to bacterial and fungal superinfection, which can result in a focal pneumonitis. The locus of the healing infection, in turn, commonly leads to pleural thickening.
The most ominous lesion that can appear as a pleural-based mass is mesothelioma. The risk of developing mesothelioma correlates with dose of asbestos exposure. The incidence of mesothelioma is between 10 and 30 per million per year in unselected male populations; this goes up by a factor of 100 among heavily exposed subjects.[6,7] Of note, the latency period for developing mesothelioma is 25 to 40 years following the initial exposure.

As this case illustrates, distinguishing patients with benign conditions from those with malignant processes based on initial presentation and radiological findings represents a formidable diagnostic challenge. Both sets of patients may present with dyspnea, cough, and fatigue, and for both groups, radiographic findings may include a pleural-based mass. Therefore, clinicians should take a methodical, step-wise approach in evaluating patients with a history of asbestos exposure who present with pulmonary symptoms. If a pleural mass is seen, a tissue sample should be obtained to establish a diagnosis. Physicians should resist premature mesothelioma diagnosis prior to a definitive tissue sample.

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