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When Pneumomediastinum Reveals Hypersensitivity Pneumonitis: A Case of Bird Fancier's Lung in A Young Woman

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Abstract | **Case Report**

Hypersensitivity pneumonitis is an immune-mediated interstitial lung disease caused by repeated inhalation of environmental antigens, most frequently avian proteins in bird fancier's lung. Spontaneous pneumomediastinum is a rare presenting manifestation and may delay diagnosis. We report the case of a 37-year-old woman presenting with extensive pneumomediastinum associated with diffuse bilateral micronodules on chest CT, leading to the diagnosis of hypersensitivity pneumonitis secondary to chronic avian exposure. This case highlights the importance of recognizing atypical radiological presentations of hypersensitivity pneumonitis and emphasizes the key role of CT imaging in identifying both mediastinal air leakage and the underlying interstitial lung disease pattern.

Keywords: Hypersensitivity pneumonitis, Bird fancier's lung, Pneumomediastinum, Computed tomography, Interstitial lung disease, Subcutaneous emphysema.

INTRODUCTION

Hypersensitivity pneumonitis (HP), also known as extrinsic allergic alveolitis, is an immunologically mediated diffuse parenchymal lung disease resulting from repeated exposure to inhaled organic antigens in susceptible individuals. Among its numerous etiologies, bird fancier's lung represents one of the most frequent causes and is related to inhalation of avian proteins contained in feathers and droppings.[1]

High-resolution CT (HRCT) plays a central role in the diagnosis of HP by demonstrating characteristic findings such as diffuse centrilobular micronodules, ground-glass opacities, mosaic attenuation, and air trapping. [2] Although respiratory symptoms are typically progressive and nonspecific, spontaneous pneumomediastinum remains an uncommon revealing feature and has only rarely been reported as the initial manifestation of hypersensitivity pneumonitis.[3]
We report an unusual case of severe pneumomediastinum revealing bird fancier's lung in a young woman.

CASE PRESENTATION

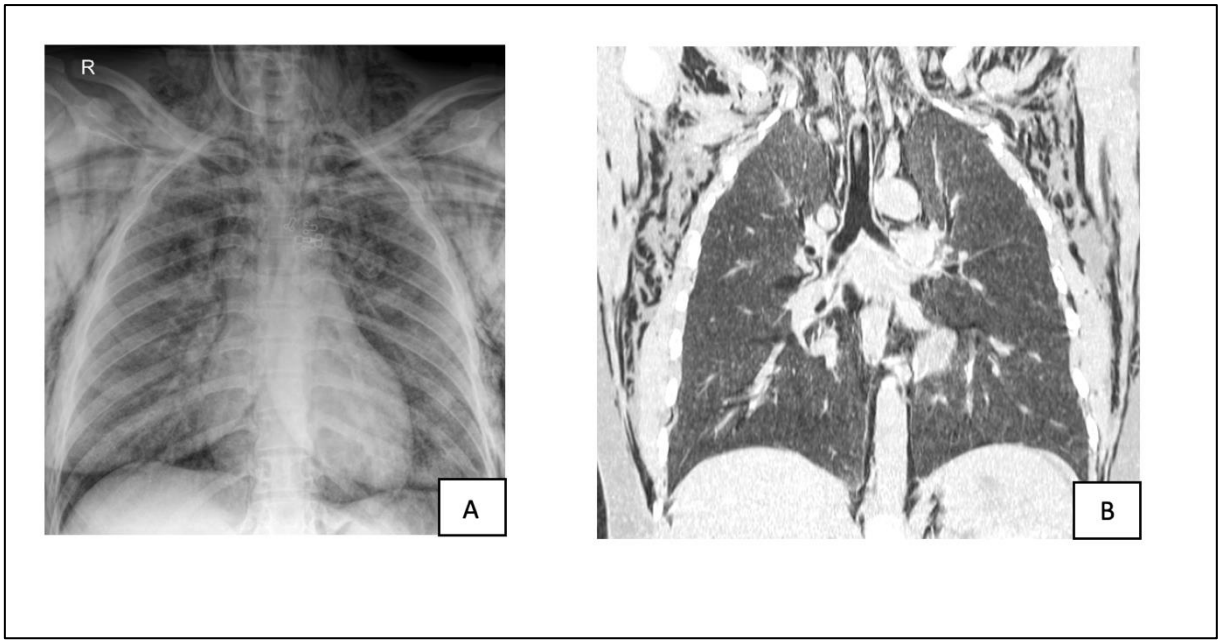
A 37-year-old woman presented with acute onset dyspnea associated with cervical swelling without history of thoracic trauma, invasive procedures, or mechanical ventilation.

Clinical examination revealed extensive cervicothoracic subcutaneous emphysema. Laboratory findings were unremarkable.

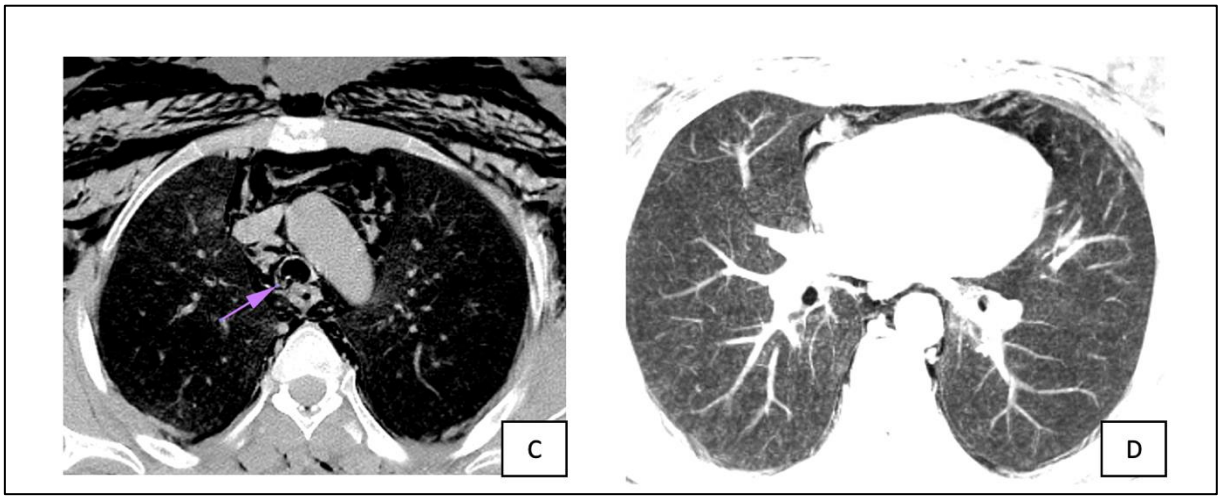
Chest CT demonstrated extensive pneumomediastinum dissecting along the bronchovascular sheaths and extending into the cervical, thoracic, abdominal, and bilateral mammary soft tissues. Associated findings included pneumorachis and a small left apical pneumothorax. A focal defect of the right posterolateral tracheal wall approximately 3 cm above the carina was suspected.

Parenchymal evaluation showed diffuse bilateral micronodules with random and centrilobular distribution, some with bronchiolar predominance and upper-lobe predominance, producing a miliary-type pattern. No significant mediastinal lymphadenopathy or pleural effusion was identified.

Further clinical history revealed chronic domestic exposure to birds, raising suspicion of hypersensitivity pneumonitis. The imaging findings were considered highly suggestive of bird fancier's lung revealed by spontaneous pneumomediastinum.



(A) Frontal chest radiograph showing diffuse cervicothoracic subcutaneous emphysema with linear lucencies outlining mediastinal structures, consistent with pneumomediastinum
(B) Coronal chest CT reconstruction (lung window) demonstrating extensive pneumomediastinum dissecting along the bronchovascular bundles and extending into the cervical soft tissues



(C) Axial chest CT image (mediastinal window) showing a focal defect of the right posterolateral wall of the trachea (arrow), located approximately 3 cm above the carina, suggesting a tracheal air leak as the probable origin of the pneumomediastinum
(D) Axial maximum intensity projection (MIP) reconstruction (lung window) highlighting numerous bilateral diffuse centrilobular micronodules with upper-lobe predominance, highly suggestive of hypersensitivity pneumonitis in the appropriate exposure context

DISCUSSION

Bird fancier's lung is one of the most common forms of hypersensitivity pneumonitis and results from repeated inhalation of aerosolized avian antigens. The disease is mediated by immune complex deposition and delayed hypersensitivity reactions affecting the pulmonary interstitium and terminal bronchioles.[1]

Chest CT plays a crucial role in early diagnosis by demonstrating characteristic features including poorly defined centrilobular nodules, ground-glass opacities, and mosaic attenuation reflecting small airway involvement. In subacute forms, diffuse micronodular involvement with upper-lobe predominance is frequently observed.[2]

Spontaneous pneumomediastinum represents an exceptional complication of hypersensitivity pneumonitis and is thought to result from alveolar rupture secondary to increased intra-alveolar pressure, with air dissecting along bronchovascular sheaths toward the mediastinum according to the Macklin effect.[3] This

mechanism explains the association with pneumorachis, pneumothorax, and extensive subcutaneous emphysema observed in our patient.

Only a limited number of similar cases have been reported in the literature, highlighting the rarity of pneumomediastinum as an initial presentation of hypersensitivity pneumonitis related to avian exposure. [3-4] Recognition of this association is important because identification and removal of antigen exposure remain the cornerstone of treatment and may prevent progression toward chronic fibrotic disease.

CONCLUSION

Spontaneous pneumomediastinum is a rare but possible presenting manifestation of hypersensitivity pneumonitis. In the presence of diffuse micronodular pulmonary involvement on CT, especially with upper-lobe predominance and bronchiolar distribution, bird fancier's lung should be considered. Careful exposure history and multidisciplinary correlation are essential for establishing the diagnosis and guiding management.

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