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A 26-year-old male patient, drugs user, presenting with dry cough and fever for two weeks. The patient has a diagnosis of acquired immunodeficiency syndrome (AIDS), with poor adherence to the treatment. His CD4 count was 20 cells/mm³ and the viral load was 495,208 cps/ml. Chest radiography demonstrated opacity in the right upper lobe of the lung. Chest computed tomography was performed (Figure 1).



Figure 1. Computed tomography with window for pulmonary parenchyma. Section at the level of the carina.

Image description

Figure 1. Chest computed tomography shows cavitated consolidation in the right upper lobe of the lung. Also, one observes small nodules and ground glass opacities adjacent to the described image as well as in the contralateral lung.

Diagnosis: *Rhodococcus equi* pneumonia in an AIDS patient.

Open biopsy was performed and culture demonstrated bacterial growth.

COMMENTS

R. equi is a Gram-positive cocci that commonly causes infection in horses and other animals. *R. equi* infection is rarely found in humans⁽¹⁾, affecting particularly individuals at advanced degree of immunodeficiency. About 80% of cases occur in AIDS patients, most of times in those presenting CD4 lymphocyte count lower than 200 cell/mm^{3(2,3)}.

In humans, the main infection site is the lung⁽¹⁾. The most frequent clinical presentation is a slow-growing pneumonic process, with cough, fever and constitutional symptoms. *R. equi* represents a frequent cause of bacteremia and extra-pulmonary signs may be found. The etiological agent can be easily isolated from the sites of infection⁽²⁾.

The main pattern of lung involvement is that of masses with heterogeneous contrast impregnation or foci of pulmonary consolidation intermingled with air bronchograms, either with or without cavitated lesions. Although cavitation may be not present at the moment of the diagnosis, it ends up developing along the disease progression⁽⁴⁾. Other findings include ground glass opacities, air-space nodules, small nodules with predominantly centrilobular distribution and the tree-in-bud pattern predominantly located around consolidations. Probably, such findings represent bronchogenic dissemination of the infection. Mediastinal lymph nodes enlargement may be present^(1,2,4-8).

The typical histopathological finding of *R. equi* infection corresponds to necrotizing cavitation or soft tissue mass composed of a dense histiocytic infiltrate with abundant eosinophilic granular cytoplasm. Polymorphonuclear leukocytes are numerous in disseminated microabscesses. Periodic acid Schiff staining demonstrates highly positive histiocytes similar to those observed in Whipple's disease. Gram-positive cocci are easily demonstrated at Gram tissue stain. Pulmonary malakoplakia is another finding described in *R. equi* infection⁽⁹⁾.

The differential diagnoses for pulmonary *R. equi* infection in AIDS patients include cavitated infections (tuberculosis, nocardiosis, fungal diseases, lung abscess), lung neoplasms, and more remotely *Pneumocystis jiroveci* pneumonia^(7,10,11). *Mycobacterium tuberculosis* infection, however, is the main differential diagnosis to be considered for patients with *R. equi* pneumonia, since both bacilli are alcohol-acid resistant.

The diagnosis of disease activity in patients with pulmonary tuberculosis depends on multiple factors, namely,

clinical signs, physical examination, tuberculin test results and, mainly, detection of the bacillus in sputum, bronchoalveolar lavage, transtracheal aspirate or in lung biopsy specimens, being reinforced by other factors such as sequential alterations at serial chest radiography and previous history of antituberculosis therapy. However, the diagnosis may be difficult considering the facts that sputum bacilloscopy may be negative in 21–66% of cases and it may take up to six weeks for a bacillus colony to grow in a culture, and that findings at chest radiography are frequently classified as indeterminate⁽¹²⁻¹⁴⁾.

High-resolution computed tomography (HRCT) has shown to be superior to plain radiography in the detection and evaluation of extent of parenchymal alterations, considering that because of its effectiveness in the evaluation of the secondary lung lobe, it allows for a better characterization of pathological pulmonary processes. A recent series of studies published by Brazilian authors⁽¹⁵⁻²³⁾ corroborates such assertion. Thus, HRCT plays an extremely relevant role in the diagnosis of pulmonary tuberculosis.

HRCT findings in patients with post-primary tuberculosis include centrilobular nodules, air space nodules, nodular opacities, tree-in-bud pattern, miliary nodules, consolidations, cavitations, bronchial walls thickening, tuberculomas, calcifications, parenchymal bands, interlobular septal thickening, ground glass opacities, pericatricial emphysema and fibrotic alterations^(12,13,24-32). Other manifestations recently described include reversed halo sign and clusters of micronodules, either with or without confluence⁽³³⁻³⁵⁾. Most of such findings can also be observed in patients with *R. equi* pneumonia.

In conclusion, *R. equi* infection should be considered in the differential diagnosis of cavitated consolidations in AIDS patients, with a particular difficult differentiation from lesions caused by tuberculosis.

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