Case 3241

Eurorad

Cystic pneumocystis jirovecii pneumonia

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Section: Chest imaging
Imaging Technique: CT
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Case Type: Clinical Cases
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Patient: 34 years, male

Clinical History:

A 34-year-old patient presented with a history of cough which he had had for one month.
Imaging Findings:

A 34-year-old heavy smoker was referred to our hospital with a history of cough which he had had for one month. He had no other complaints. The patient had been followed up for 14 years for a post-transfusional HIV seropositivity. He had an AIDS status since Candida albicans oesophagitis was diagnosed in 1996. Recently, antiretroviral treatment had been suspended after four lines. A pulmonary physical examination was found to be abnormal at the base of the right lung. Auscultation disclosed rhonchi over the right lower lobe. X-ray (Fig. 1) and computed tomography of the lungs (Fig. 2), including thin section acquisition (Fig. 3), was performed. A diagnosis of the cystic form of Pneumocystis jirovecii Pneumonia (PCP) was made based on results of the Polymerase Chain Reaction of the bronchoalveolar lavage, the radiological features and the elevation in the serum lactate dehydrogenase level. The treatment consisted of oral administration of trimethoprim-sulphamethoxazole (Bactrim).
Discussion:

Pneumocystis jirovecii pneumonia (PCP) is said to be caused by pneumocystis jirovecii (formerly pneumocystis carinii) an ubiquitous protozoan which is classified as a fungus. PCP is the most common pulmonary infection in patients with AIDS and the most frequently used index to diagnose AIDS in the industrialized world. Even the first episode can be severe with a high mortality rate (up to 25%). PCP occurs mainly in immunocompromised patients (undergoing bone marrow or organ transplantation, receiving corticosteroids or chemotherapy …) and especially in patients with the Acquired ImmunoDeficiency Syndrome (AIDS). The maximal risk exists when the CD4+ count is less than or equal to 200 cells per cubic millimetre. The clinical symptoms of PCP are non-specific and variable in their presentation: non-productive cough, dyspnea, shortness of breath, and fever. The clinical course at the onset of infection is also variable. It can be insidious or brutal with a great alteration of the clinical status. PCP has a large spectrum of radiological and CT features. Classical X ray signs include diffuse or perihilar, bilateral, symmetric, reticular or granular infiltrates that can be exclusively interstitial or associated with air-space consolidation. The classical CT pattern is an extensive ground-glass attenuation, homogeneous or patchy in its presentation, sometimes associated with a thickening of the septal lines. However, atypical features are more and more frequently encountered and must be known. These findings include cavitating nodules or masses, cysts, spontaneous pneumothorax, focal alveolar or lobar consolidation, miliary nodular pattern, and interstitial fibrosis (in the chronic form of PCP). Mediastinal and hilar lymph node enlargement, and pleural effusions can also be seen, but differential diagnosis in cases such as mycobacterial and bacterial infections, lymphoma and Kaposi’s sarcoma should be excluded. PCP may present as an upper lobe distribution, simulating tuberculosis especially in patients with AIDS

treated with prophylactic inhaled pentamidine. The cystic form of PCP is encountered in 10%–30% based on different studies. The cysts are often multiple, varying in size, location and extent of inflammation. They are frequently thin walled, sometimes surrounded by alveoli filled with an inflammatory exudate. Their etiology is unclear. Several theories have been proposed : check-valve bronchiolar obstruction, cavitary infarction due to necrotizing vasculitis etc. Some of these cysts can be located in the subpleural area, and the patients with the cystic form of PCP have a higher prevalence of pneumothorax, sometimes with a grim prognosis. The differential diagnosis of the cystic form of PCP includes bullous emphysema, cystic lesions of intravenous drug abusers, post-infectious pneumatoceles (Staphylococcus), post-traumatic pneumatoceles, coccidiodomycosis, necrotizing metastasis and less frequently lymphangioleiomyomatosis or histiocytosis X. The treatment consists of oral administration of trimethoprim-sulphamethoxazole (Bactrim) or inhaled pentamidine. The response is rapidly favourable when treated in 50% of the cases. The regression of the radiological abnormalities is seen in about one month. However, cysts can persist either transiently or even permanently. In the case of persistent symptoms, a neoplastic or an associated infectious process as well as interstitial fibrosis should be ruled out.
Differential Diagnosis List: Cystic form of pneumocystis jirovecii pneumonia.

Final Diagnosis: Cystic form of pneumocystis jirovecii pneumonia.

References:

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Crit Rev Diagn Imaging. 1999 Aug;40(4):251-84. (PMID: 10514937)
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Radiographic distribution of Pneumocystis carinii pneumonia in patients with AIDS treated with prophylactic inhaled pentamidine.
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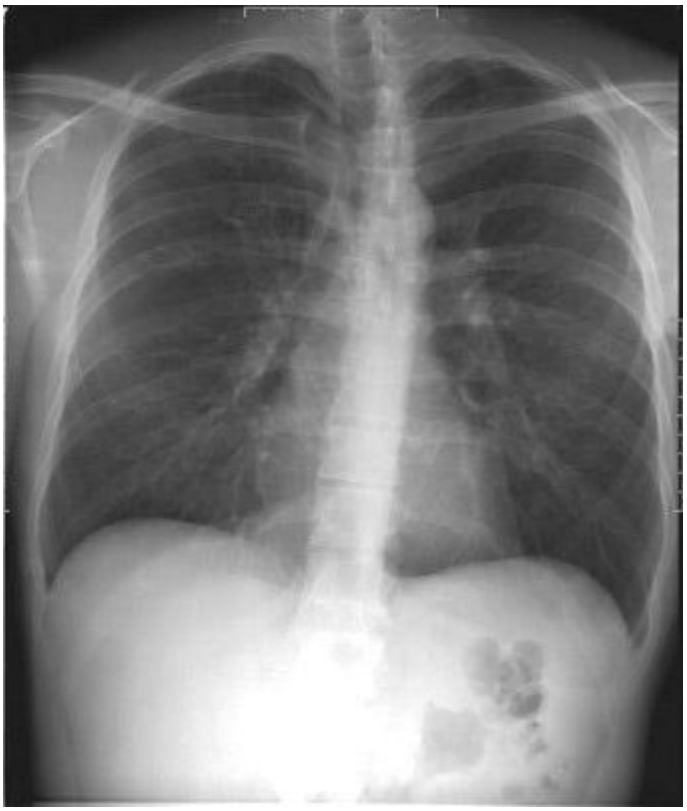
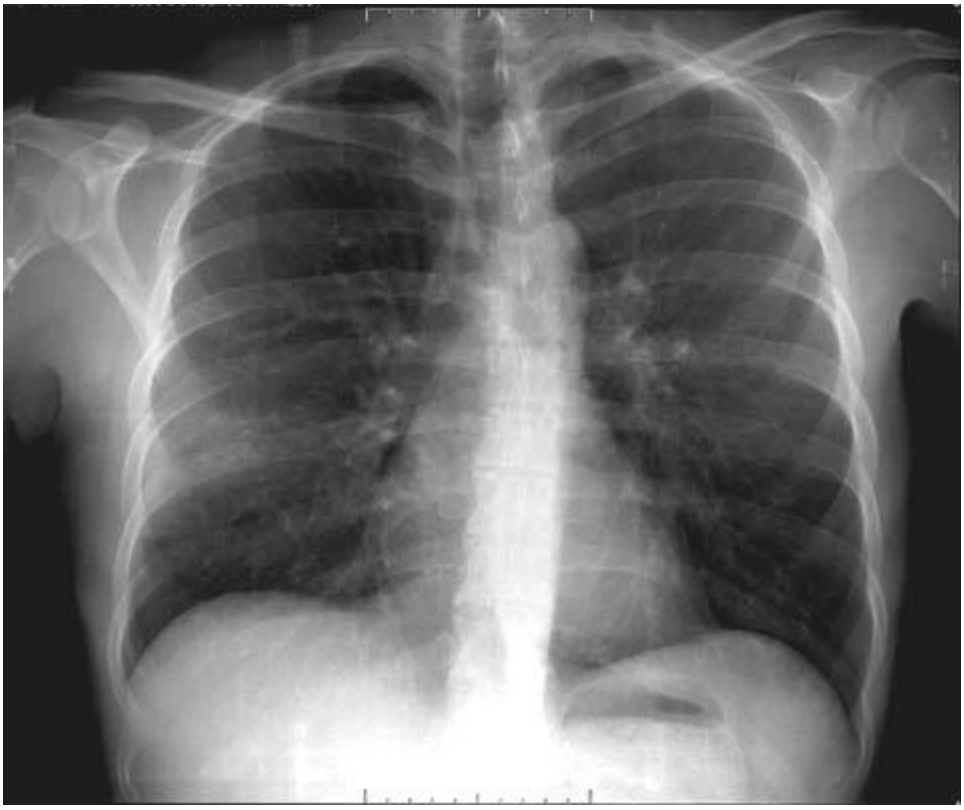
Figure 1

a



Description: A chest X-ray scan performed 1 month before admission. **Origin:**

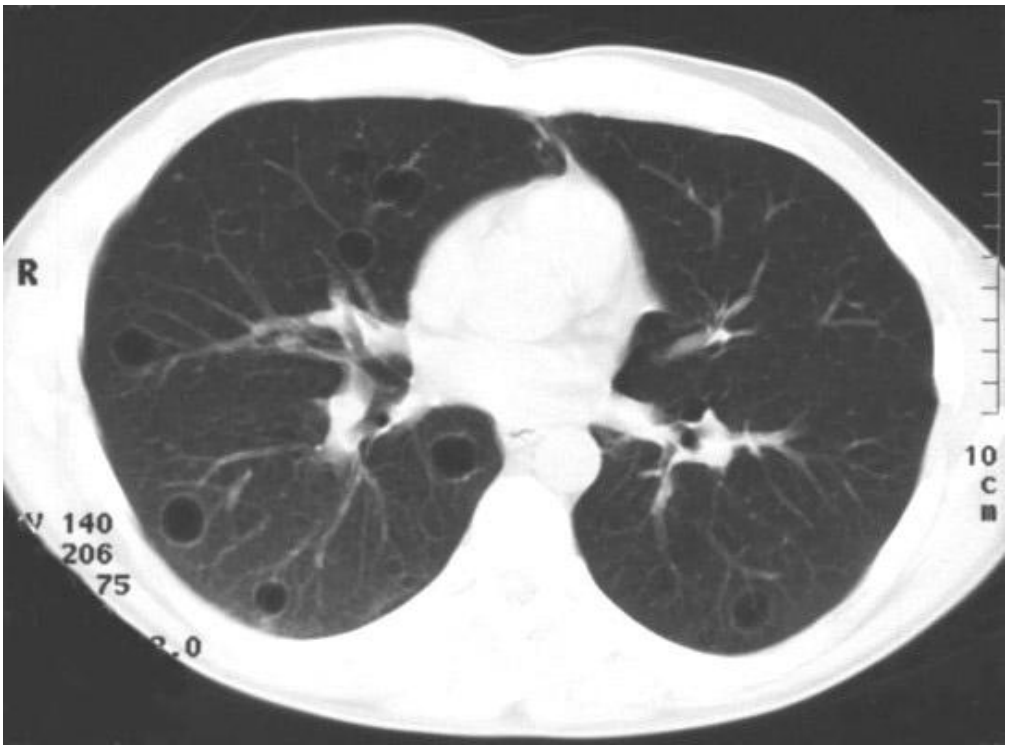
b



Description: A chest X-ray scan performed on admission.No change is visible. **Origin:**

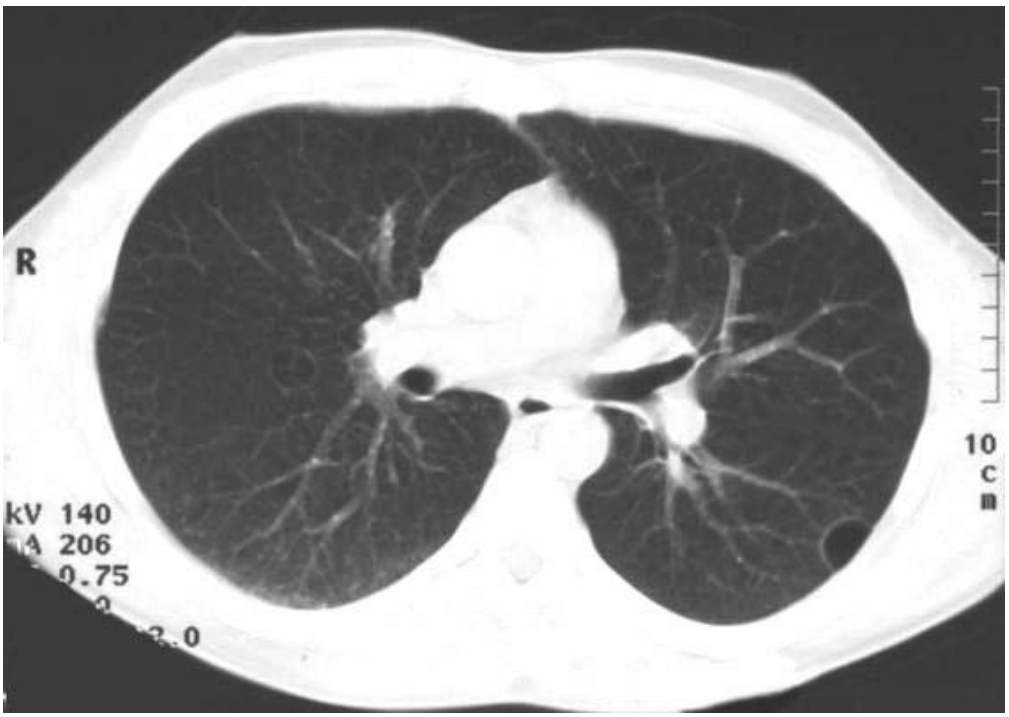
Figure 2

a



Description: A CT image showing multiple cyst-like lesions disseminated in both lungs. No mediastinal lymphadenopathy or parenchymal consolidation is seen. **Origin:**

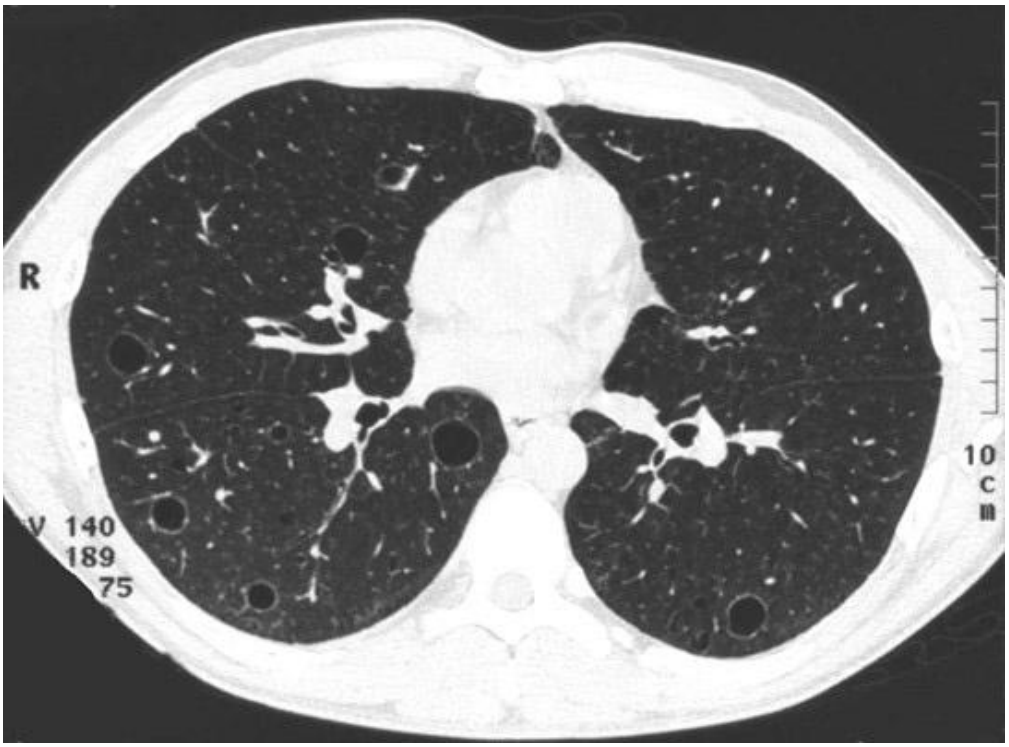
b



Description: A CT image showing one cystic lesion localized in the sub-pleural area. **Origin:**

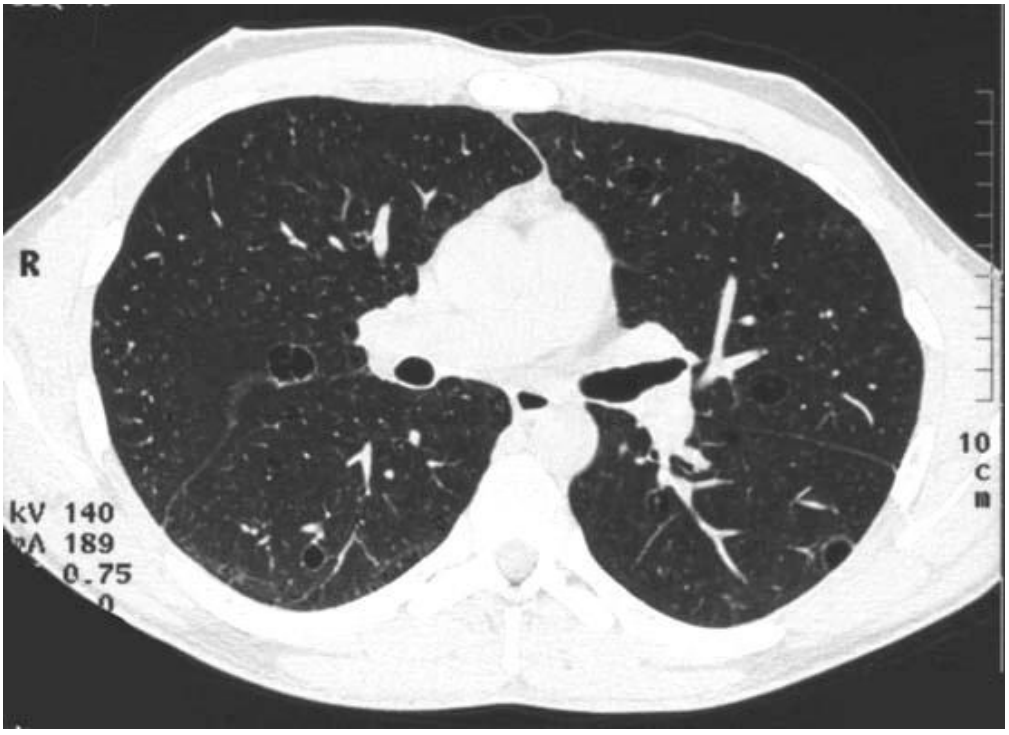
Figure 3

a



Description: A thin section CT image confirming the presence of multiple thin-walled cystic lesions. No evidence of bronchiectasies or ground-glass opacities. No interstitial abnormalities. **Origin:**

b



Description: A CT image showing one cystic lesion localized in the sub-pleural area. **Origin:**