

## Dyspnea in apparently healthy patient: from diagnosis to risk factors

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**Section:** Chest imaging

**Area of Interest:** Thorax Lung

**Procedure:** Diagnostic procedure

**Imaging Technique:** Digital radiography

**Imaging Technique:** CT-High Resolution

**Imaging Technique:** CT

**Special Focus:** Infection Case Type: Clinical Cases

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**Patient:** 30 years, male

### Clinical History:

30-year-old male patient, hashish smoker. The patient presented at the emergency department with odynophagia, cough and fever that had been present for 20 days. The physical exam was normal. The blood test showed leukocytosis and the gasometry, hypoxemia. A chest x-ray and CT angiography of pulmonary arteries were performed.

### Imaging Findings:

A chest x-ray and CT angiography of pulmonary arteries were performed to rule out pulmonary embolism. Chest x-ray showed bilateral, reticular interstitial pattern (Figure 1). CT angiography was negative for pulmonary embolism. However, it showed bilateral "ground glass" opacities and cystic images (Figure 2). Due to the worsening of the patient's clinical situation and the radiological findings, the patient was admitted to modify the therapeutic management and complete the study of his process. Finally, microbiological findings and positive HIV serology suggested that the radiological findings could be compatible with *Pneumocystis jirovecii* infection. Antibodies and antiretroviral therapy were initiated and the patient showed a good evolution. The pre-discharge chest x-ray was normal (Figure 3).

### Discussion:

The respiratory tract is the most frequent site of infection in HIV-positive patients. Despite the use of antiretroviral therapy, *Pneumocystis jirovecii* (PJP) remains the most frequent causative agent [1]. The risk of developing such infection is influenced by the degree of immunosuppression. Clinically, it presents with a non-productive cough, dyspnea, fever and marked hypoxemia [2].

Although the final diagnosis is confirmed by microbiological tests, imaging tests are especially helpful when there are no data indicating that the patient is immunocompromised or has other related risk factors. From the radiological point of view, the "ground glass" pattern presents a wide differential diagnosis, which includes respiratory infections caused by opportunistic germs, chronic interstitial diseases, acute alveolar disorders such as acute pulmonary oedema or alveolar haemorrhage and other causes such as drug toxicity. However, its association with cystic images (present in our patient) is highly suggestive of infection by opportunistic germs such as PJP vs

Cytomegalovirus [3]. Other radiological findings typical of this entity are the predominance in upper lobes, focal areas of consolidation or nodules. Infections by opportunistic germs are usually associated to immunocompromised patients. At first, our patient did not show this condition, but microbiological findings and positive HIV serology suggested that the radiological features could be compatible with PJP infection. For these reasons, we confirmed that there was a good correlation between clinical and radiological findings. The correct interpretation of radiological findings and their clinical correlation is very important [4][5]. In our case, CT was very helpful to suggest the diagnosis of PJP and this diagnosis influenced the clinical approach towards a search for underlying causes, HIV infection was diagnosed in an apparently healthy patient.

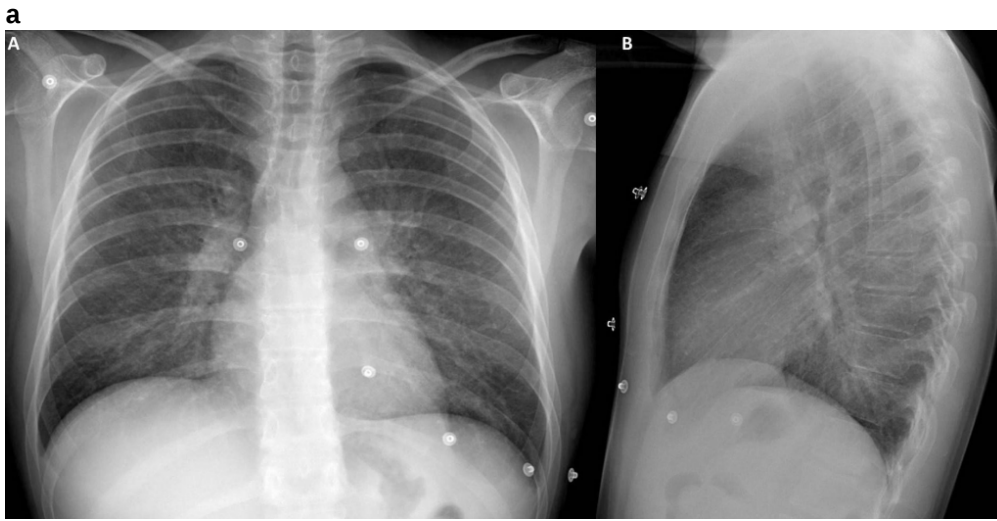
**Differential Diagnosis List:** Pneumocystis Jirovecci Infection in an HIV patient., Cytomegalovirus infection, Chronic interstitial disease, Acute alveolar disorder (pulmonary oedema or alveolar haemorrhage), Drug toxicity

**Final Diagnosis:** Pneumocystis Jirovecci Infection in an HIV patient.

#### References:

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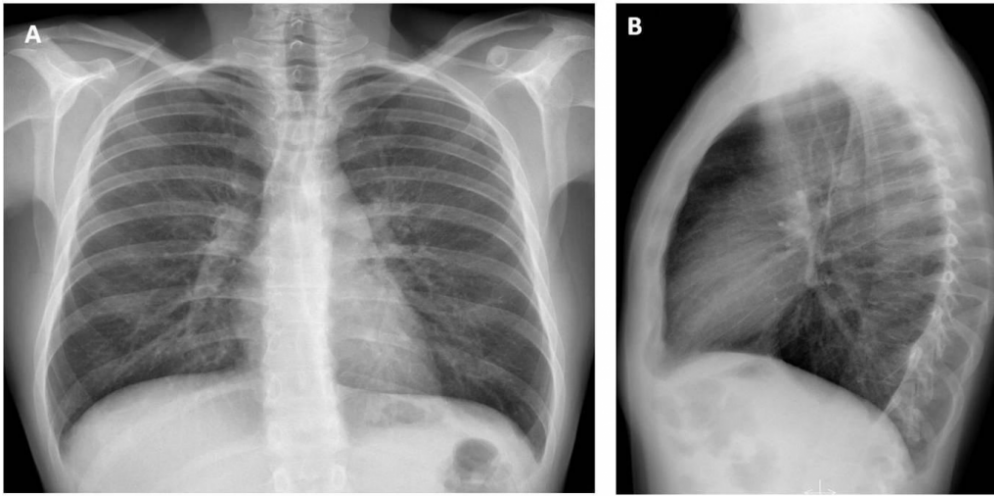
**Figure 1**



**Description:** Chest x-ray (PA and side) which showed bilateral, reticular opacities. It was performed at the emergency department (pre-treatment). **Origin:** Department of Radiology, Clinical Hospital, Valladolid, Spain

**Figure 2**

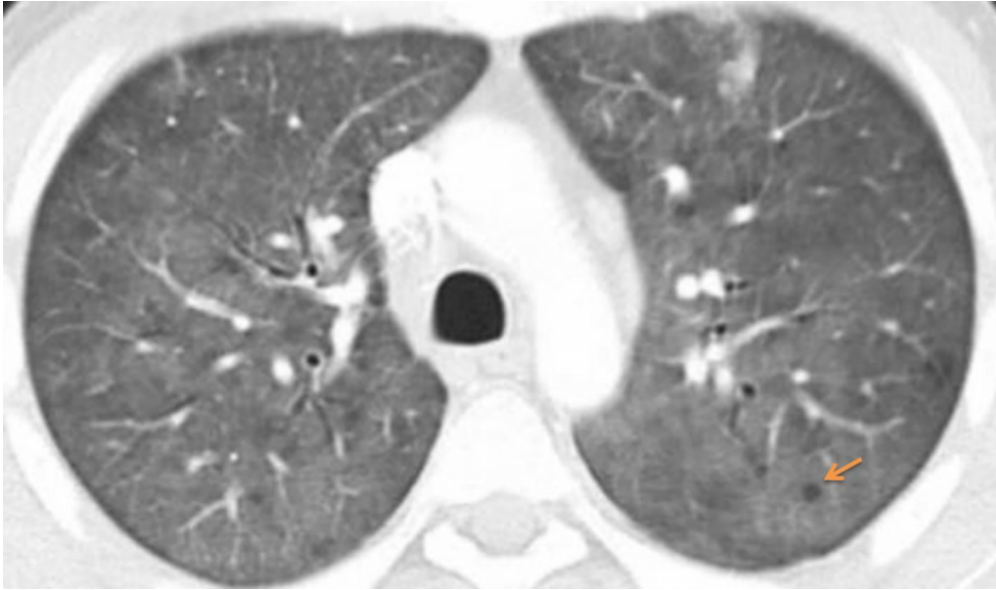
a



**Description:** Chest x-ray post-treatment showed normal findings in both PA (panel A) and side (panel B) scans. **Origin:** Department of Radiology, Clinical Hospital, Valladolid, Spain

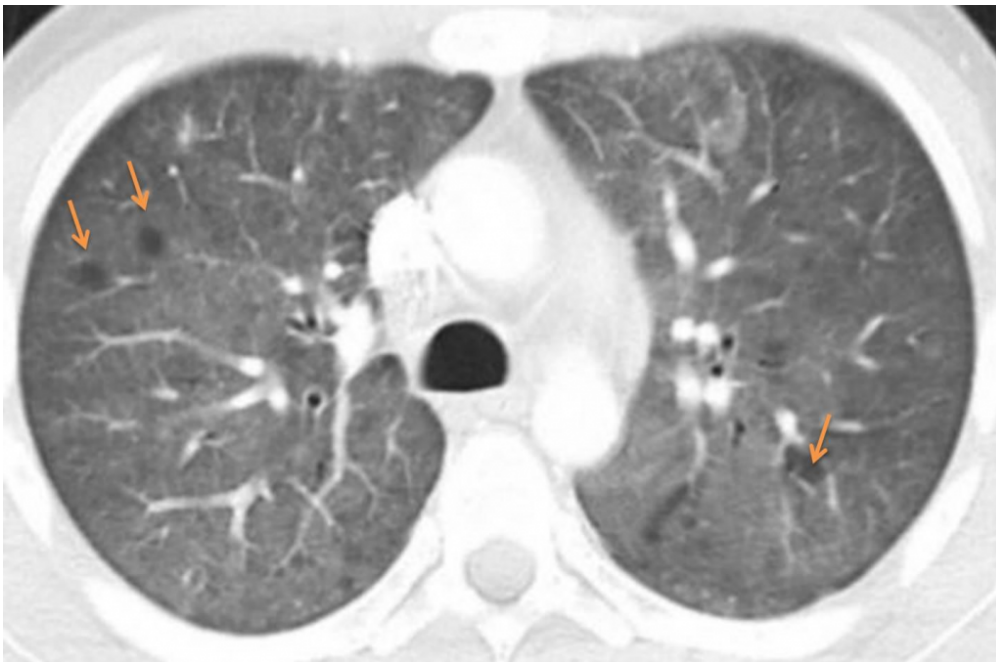
**Figure 3**

**a**



**Description:** Axial scans Thorax CT which show bilateral, diffuse, "ground-glass" opacities and cystic images (orange arrows). These radiologic features are common in infections caused by opportunistic germs. **Origin:** Department of Radiology, Clinical Hospital of Valladolid, Valladolid, Spain.

**b**



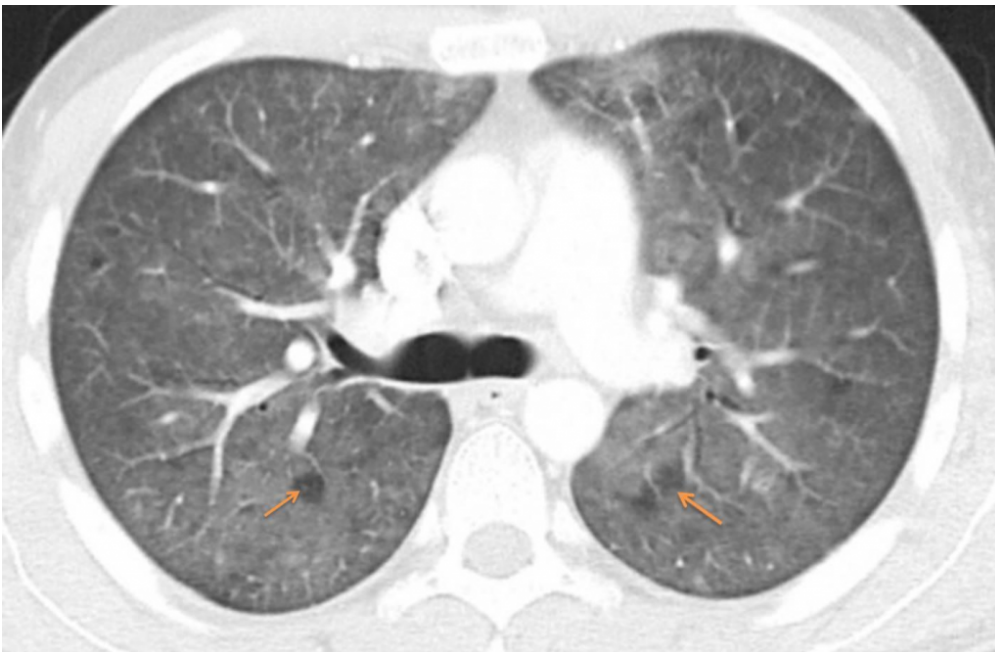
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c



**Description:** Axial scans Thorax CT which show bilateral, diffuse, "ground-glass" opacities and cystic images (orange arrows). These radiologic features are common in infections caused by opportunistic germs. **Origin:** Department of Radiology, Clinical Hospital of Valladolid, Valladolid, Spain.

d



**Description:** Axial scans Thorax CT which show bilateral, diffuse, "ground-glass" opacities and cystic images (orange arrows). These radiologic features are common in infections caused by opportunistic germs. **Origin:** Department of Radiology, Clinical Hospital of Valladolid, Valladolid, Spain.