

## Case Report

# Case of Pulmonary Legionellosis Confusing with Viral Pneumonia SARS COV-2 on CT

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**Abstract:** Legionellosis is an acute community-acquired pneumonia in 90% of cases with a hospitalization rate of over 90%. The clinical presentation, although non-specific, is clearly described and biological tools allow a certain and rapid diagnosis. There is no typical radiographic pattern of Legionella infection that would allow differentiation of Legionellosis from other infectious or non-infectious pneumonias, especially on chest CT. We report the case of a 52-year-old patient in whom the scanographic signs strongly suggest a Covid infection<sup>19</sup>. The diagnosis was confirmed by molecular biology.

**Key words:** Legionellosis, pneumonia, CT scan, ground glass, PCR.

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## INTRODUCTION

Legionellosis is a pulmonary infection first described in 1976 (Fraser DW et al., 1977). It accounts for a significant proportion of community-acquired pneumonia in hospitals. Legionellosis characterised by pneumonia is the most common form of Legionella disease. Nevertheless, flu-like syndromes called Pontiac fever and extra pulmonary forms have been reported. Although radiographic and CT signs of legionellosis are aspecific, their combination in certain clinical contexts should be used to suggest the diagnosis of legionellosis. Diagnostic techniques have evolved. Indeed, rapid diagnosis by urinary antigen research remains the reference but other diagnostic methods are now usable, such as PCR on respiratory samples.

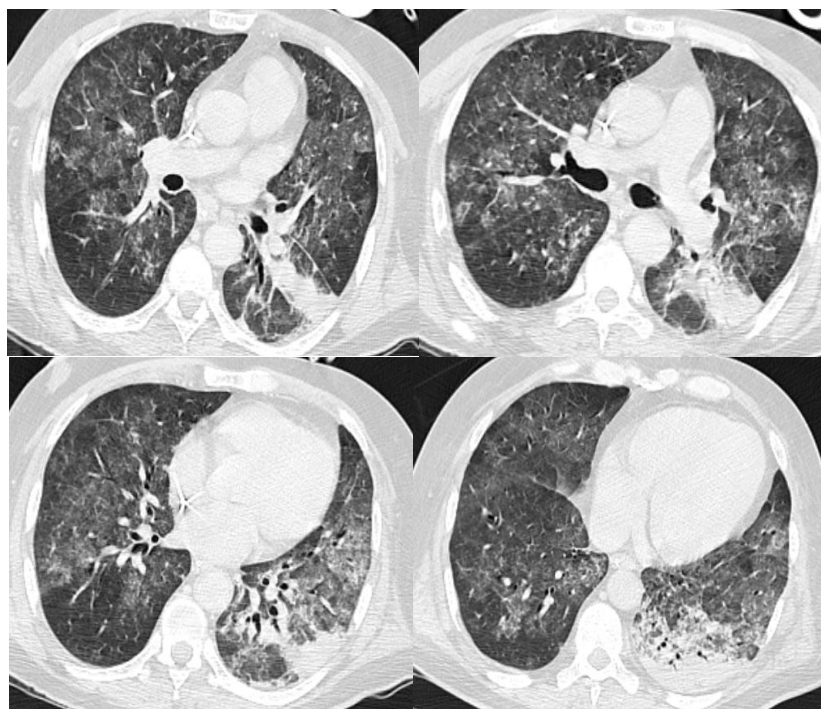
## CASE REPORT

The patient was a 52-year-old man with a history of active smoking and diabetes on oral anti-diabetics. He presented with a febrile syndrome associated with a dry cough evolving for 3 days. The

evolution was marked by the appearance of a progressive dyspnea with respiratory difficulty motivating the patient to consult. The patient had undergone a nasopharyngeal respiratory swab for Covid 19 infection by PCR.

The thoracic CT scan showed the presence of small, scattered, bilateral ground-glass foci predominantly in the periphery with reticulation creating a crazy paving appearance with an estimated involvement of less than 50%. There is a diffuse and bilateral reticulo-micronodular interstitial infiltrate and apical and postero-basal left alveolar condensation foci (figures). The absence of significant mediastinal and hilar adenopathies should be noted.

This radiological presentation strongly suggests an infectious origin, without however deciding on its nature. Molecular biology results excluded covid 19 infection and found the presence of Legionella pneumoniae, thus confirming a pulmonary legionellosis of delicate radiological presentation.



**Fig: Chest CT axial sections in parenchymal window showing micro nodular infiltration on a background of bilateral lung ground glass areas associated with foci of left condensation**

## DISCUSSION

The actual incidence is underestimated in many countries due to a potential lack of diagnosis and surveillance. Its frequency among community-acquired pneumonia varies from 3.5% in hospitals to 17.6% in intensive care units (Woodhead, M., 2002). Currently, 65 species, three subspecies and more than 70 serogroups of *Legionella* have been identified. The majority of cases are due to Lp and particularly Lp 1 which is responsible for more than 90% of cases.

Transmission of *Legionella* to humans occurs through inhalation of water aerosols contaminated with the bacteria. As the clinical picture of *Legionella* infection is not very specific, it is essential to know the risk factors for this disease in order to evoke it and make the diagnosis. These risk factors include age over 50, male gender, smoking, diabetes, cancer or any haematological disease, and steroid or immunosuppressive therapy (Chidiac C *et al.*, 2012).

*Legionella* infections result in two main clinical pictures (Beraud L *et al.*, 2018). Legionellosis or Legionnaires' disease, which is a pneumonia most often described as atypical. This follows an incubation period of 2-14 days and usually begins with a febrile syndrome associated with a dry cough without nasopharyngeal signs, generalized malaise and nausea. Within a few days, the cough becomes more severe with chest pain, frequent dyspnoea and sometimes purulent or bloody sputum.

Pontiac fever is an influenza-like syndrome with fever without pneumonia. Extra pulmonary forms

are rare. They may or may not be associated with pneumonia (Leggieri N *et al.*, 2012). There is no typical radiographic pattern of *Legionella* infection to differentiate Legionellosis from other infectious or non-infectious pneumonia. Chest radiography typically shows heterogeneous unilateral or multi-lobe infiltrative opacities, initially unilateral and confluent progressing to condensation and in some cases to asymmetric bilateralization (Leggieri N *et al.*, 2012 & Testaert H *et al.*, 2020).

In practice, any type of image can be observed and legionellosis is hardly differentiable by its radiological criteria from other bacterial pneumonia. Chest CT scans also show specific signs. Typically, multi-lobe or multi-segmental pneumonia is seen in the form of well-limited intra-parenchymal condensations with aerated bronchograms within "ground glass" areas which may also be independent. There is no predominance of upper or lower lung areas. Small pleural effusions are common and usually on the side of the lung disease. Although the presence of mediastinal adenopathy is atypical on radiography, it is frequently described on chest CT (Testaert H *et al.*, 2020).

Legionellosis resembles many community-acquired bacterial pneumonias both radiographically and CT, including pneumococcal, *Klebsiella* and staphylococcal pneumonia. It also has similarities with other atypical pneumonias related to *M. pneumoniae* or viral pneumonias in this case Covid 19 pneumonia (Cunha, B. A *et al.*, 2017 & Cunha, BA, 2010). Rapid diagnosis of legionellosis is based on the detection of

specific antigens in urine and/or Legionella PCR in respiratory specimens (CDC, 2020). Legionellosis is characterised by the ineffectiveness of beta-lactam antibiotics, the first-line treatment for community-acquired pneumonia. Effective antibiotics are intracellular antibiotics such as macrolides, fluoroquinolones or rifampicin (Kellerman, RD, & Bope, ET, 2017).

## CONCLUSION

Legionella accounts for a significant proportion of community-acquired pneumonia in hospitals. The radiographic presentation of legionellosis is aspecific and cannot be differentiated from its main differential diagnoses, which are bacterial or viral pneumopathies, in particular covid19 pneumopathy, with which there is diagnostic confusion.

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