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Diagnosis at first sight

Fever and migratory nodules in the lung

Fiebre y nódulos pulmonares migratorios

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A 26-year-old male patient with no relevant medical history or toxic habits consulted with a one-week history of febrile syndrome with profuse sweating, all-over headache, asthenia and general malaise. He denied coughing or other respiratory symptoms. As epidemiological background, he reported having recently been in the Extremadura region of Spain, in contact with goats and other domestic animals, and consuming unpasteurised dairy products.

Cardiorespiratory and abdominal examinations were normal, with no lymphadenopathy or skin lesions. The only finding was a temperature of >38°C, without oxygen desaturation. Laboratory tests showed leucocytosis of $11.9 \times 10^3/mm^3$ with left shift and raised C-reactive protein (CRP) (26.5 mg/dl). The rest of the blood count and clinical biochemistry parameters were within normal limits. Chest X-ray (Fig. 1) revealed multiple bilateral nodular infiltrates without associated pleural effusion.

After admission, the patient was given empirical antibiotic therapy with amoxicillin/clavulanic acid, but the fever persisted. Chest computed tomography (CT) showed nodular consolidation in both lungs, plus a predominantly subpleural air bronchogram with a ground-glass halo sign (Fig. 2). A repeat X-ray taken five days later showed a different infiltration pattern (Fig. 3).

Blood cultures, *Streptococcus pneumoniae* and *Legionella pneumophila* urinary antigen tests and serology for HIV were all negative. An oropharyngeal swab was also taken and a respiratory virus panel (Anyplex® Seegene) and multiple PCR (FilmArray®, bioMerieux, Spain) were performed, which were negative for Influenza A and B, respiratory syncytial virus (RSV) A and B, Adenovirus, Enterovirus, Metapneumovirus, Parainfluenza virus (1, 2, 3 and 4), Bocavirus, Coronavirus (NL63, OC43, 229E) and Rhinovirus, Coronavirus HKU1, *Bordetella pertussis*, *Bordetella parapertussis*, *Chlamydia pneumoniae* and *Mycoplasma pneumoniae*. Bronchoalveolar lavage (BAL) and bronchial aspirate (BAS) culture for bacteria showed mixed flora; fungal infection was ruled out by culture and 18 s sequencing. Serology for *Brucella sp.*, *Strongyloides stercoralis*, *Toxocara sp.*, *Leptospira sp.*, *Treponema pallidum* and *Echinococcus sp.* was all negative and the presence of IgG for *Chlamydophila pneumoniae* and *Mycoplasma pneumoniae* was demonstrated, with IgM being negative. Lastly, a serological study was carried out against *Coxiella burnetii* (*C. burnetii*), with phase II IgG (IIF) results of 1/2,048 obtained using the VirClia® instrument (VIRCELL® reagents), and IgM (CLIA) of 5.53 using the ABBOTT® next-generation Alinity system (reagents from the same company). We considered the results for IgM to be positive due to their high value and ruled out that they were caused by cross-reactions due to the high IgG titre.

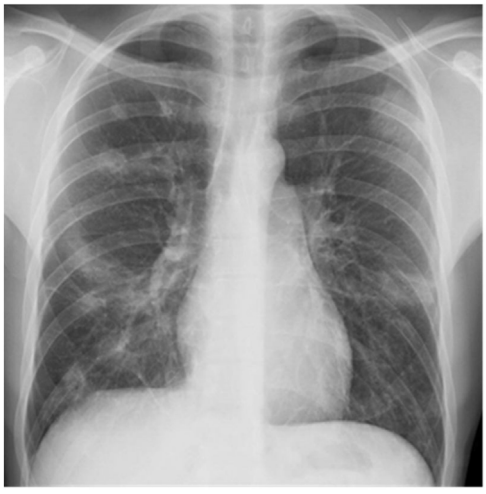

Figure 1. Chest X-ray on admission. Multiple nodular infiltrates can be seen.

Screening for autoimmune diseases (CH50, ANA, ANCA, and RF) and cytology study of BAL and BAS were also negative.

With a suspected diagnosis of Q fever, we started antibiotic therapy with oral doxycycline 100 mg every 12 h for 14 days. The patient quickly became afebrile and the nodular infiltrates on his lungs resolved (Fig. 4).

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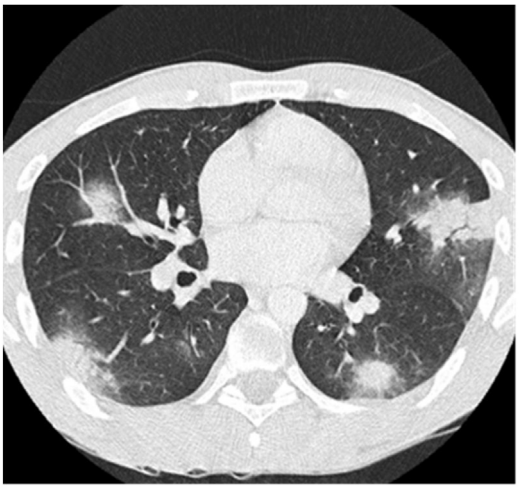

Figure 2. Chest CT showing nodular consolidation in both lungs.

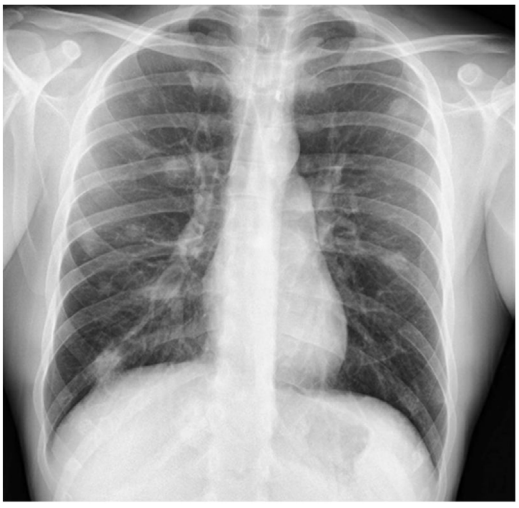

Figure 3. Chest X-ray. Pattern of pulmonary infiltrates different from previous images.

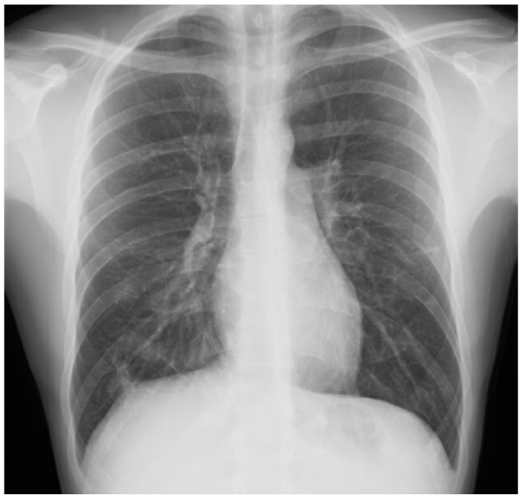

Figure 4. Follow-up chest X-ray. Resolution of pulmonary infiltrates.

Q fever is an anthropozoonosis with cosmopolitan distribution and is considered an underdiagnosed disease in view of its nonspecific symptoms. The agent responsible is *C. burnetii*, an intracellular Gram-negative bacillus with an affinity for infecting mononuclear phagocytes.[1] The transmission mechanism in humans is usually through the air, by inhalation of viable microorganisms from urine, faeces, milk, placenta or amniotic fluid from sheep, goats, cows and other domestic animals. Cases of transmission through consumption of unpasteurised dairy products have also been reported. Acute Q fever can be asymptomatic in up to 50% of cases, and although presentation can vary greatly, it most commonly manifests in the form of pneumonia, acute hepatitis or a flu-like illness.[1] The prevalence and geographic distribution are very heterogeneous, although the prevalence is higher in rural areas. In Spain, lung involvement is reported to be more common in the north and fever and hepatitis in other regions.[2,3]

The radiological findings in cases of pneumonia are variable and non-specific; lobar or segmental consolidation has been described, which may affect several segments and be unilateral or bilateral, and also pleural effusion.[1,4] Nodular consolidation with a ground-glass halo sign on high-resolution CT have also been reported, predominantly with segmental and peripheral distribution.[5] Multiple rounded opacities, although very rare, have been reported in relation to Q fever, and it has even been suggested that this radiological image should point to a diagnosis of *C. burnetii* pneumonia.[5,6]

This case supports radiological findings in the form of multiple nodular pulmonary infiltrates as a possible uncommon form of presentation of acute Q fever pneumonia in Spain, with *C. burnetii* serology being necessary to confirm the suspected diagnosis.

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