Chest Imaging of a rare case of cat-scratch disease in a 2-years-old baby

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Summary. Cat-scratch disease (CSD) is usually a self-limiting infection that in the majority of cases occurs as lymphadenitis in children who have been scratched or bitten by a cat. Rarely, Bartonella henselae is cause of fever of unknown origin (FUO), with dissemination to various organs, mimicking an inflammatory rather than a lymphoproliferative disease. This manuscript will present a case of thoracic manifestations of CSD in an immunocompetent 2-years baby without history of cat contact, with fever of unknown origin, investigated by chest CT and MRI. (www.actabiomedica.it)

Key words: Cat-scratch disease, pediatrics, magnetic resonance, Bartonella henselae, chest

A previously healthy 2-year-old girl was admitted to our hospital with a history of 6 weeks of intermittent fever and a pulmonary consolidation in the left lower lobe, treated with amoxicillin-clavulanic acid and antipyretics therapy at home. Any localising signs or symptoms were found during physical examination, in particular no enlarged palpable lymphnodes and no skin lesions were detected.

Complete blood count was normal, C-reactive protein (CRP) was 1.9 mg/dl, while the erythrocyte sedimentation rate (ESR) and fibrinogen values were in the normal ranges. She tested negative for Epstein–Barr virus, Pneumococcus, Staphilococcus aureus and Streptococcus pyogene, Mycobacterium Tuberculosis bacilli. Quantiferon test was negative and no tuberculosis bacilli were found in broncoalveolar lavage. Vanillylmandelic acid (VMA) test and other routine serum chemistries were performed with negative results.

A chest radiograph demonstrated a large pulmonary consolidation in the upper right lobe associated with mediastinal bulging on the right side (Figure 1). Any consolidation was seen in the left lung. Bronchoscopy yielded normal findings. Ultrasonic examination of abdominal organs was negative too.

During the hospitalization the girl underwent a chest CT scan with contrast medium that confirmed the consolidation of the upper right lobe and revealed a large soft tissue attenuation mass occupying the mediastinum: it extended from the anterior to posterior mediastinum, occupying the pretracheal space, involving the right hilum and the space behind the heart (Figure 2). This mass was characterized by homogeneous contrast enhancement without signs of necrosis inside. No pleural effusion was detected. Our first hypothesis was a pneumonia associated with a wide mediastinal lymphnode pack, but we were not able to exclude a lymphomatous mass.

A chest MR was also performed confirming the presence of a solid and homogenous mediastinal mass, that was characterized by high signal intensity on STIR images and DWIBS sequences, and moderate enhancement after intravenous Gadolinium injection. Thymus presented normal appearance and signal intensity.
In order to exclude lymphoproliferative disease, the girl underwent a bone marrow aspiration but any abnormal results were found. Finally a CT-guided biopsy of the mediastinal mass was performed and the polymerase chain reaction (PCR) effectively provided laboratory diagnosis of *Bartonella henselae*.

**Discussion**

*Bartonella henselae*, is a gram-negative bacillus, acquired from a bite or a scratch of a cat, that causes typical manifestations of the Cat-Scratch Disease (CSD) as fever and regional lymphadenitis of the region of inoculation (1-5). The majority of cases presents painful but self-limited lymphadenopathies, especially of the neck, axillary region or upper extremities. Just in few cases Bartonella h. may cause only prolonged fever of unknown origin, without lymphadenopathies (5-25% of patients) (6-11).

More rarely (5-14%) this infection may have atypical manifestations caused by hematogenous spread of the germ leading to systemic disease (4-7). In these cases Bartonella h. may present atypical manifestations as hepatic and splenic abscess, endocarditis, encephalopathy osteomyelitis, Perinaud oculoglandular disease, neuroretinitis (6).

In our case, the patient presented prolonged fever of unknown origin and a large solid mass of mediastinum diagnosed as lymphnodes pack, associated with pulmonary consolidation, without pleural effusion.

The diagnostic process included the evaluation of systemic infectious and non infectious disease causing mediastinal lymphadenopathy, as tuberculosis (TB), sarcoidosis, lymphoma or metastatic disease (12-17).

In the 44% of patients with TB, mediastinal lymphnodes are enlarged with evidence of caseous necrosis (13, 14). Sarcoidosis, especially the juvenile type, is a multisystem granulomatous disease characterized by mediastinal non-caseating lymph nodes enlargement (18, 19).

Lymphoma is a systemic disease that may be easily confused with tuberculosis or sarcoidosis in case of mediastinal lymphadenopathies (13, 14).
Pathologically lymph nodes affected by Bartonella h. present a granuloma with central avascular necrosis and cortical thickening and germinal hypertrophy (1), so they may be easily mistaken for metastasis. Conversely, neoplastic lymphadenopathy shows central necrosis only after radiotherapy or chemotherapy (16, 17, 20).

Therefore lymphadenopathy associated with persistent fever is a nonspecific finding because it may be associated with variable etiologies, so the diagnosis is not easy cause the overlapping of clinical and imaging findings.

In our case imaging showed a nonspecific mediastinal mass, the etiology of which was demonstrated by laboratory after biopsy.

In conclusion, the definitive diagnosis in a patient with mediastinal lymphadenopathy needs of an extensively investigation by a detailed history, an accurate physical and laboratory examination and a good reading of Imaging.

Informed consent: informed consent was obtained from all individual participants included in the study.

References