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# Hepatic and splenic involvement in cat-scratch disease: imaging features

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**Abstract**
Hepatosplenic involvement in cat-scratch disease, probably underdiagnosed, is characterized by multinodular lesions throughout the liver and spleen. Radiologic features of ultrasound, computed tomography, and magnetic resonance imaging are not specific. The key of the diagnosis relies on a history of cat or kitten contact. A specific serological test can confirm the diagnosis without invasive procedures such as biopsy.

**Key words:** Cat-scratch disease—Liver—Spleen—Magnetic resonance imaging.

Cat-scratch disease is a common cause of regional lymphadenitis due to *Bartonella henselae*. Several recent reports have highlighted rare systemic manifestations of this illness. We report on a case of granulomatous hepatosplenic involvement in a 10-year-old boy presenting with fever and abdominal pain.

## Case report

A previously healthy 10-year-old boy was admitted to our hospital for investigation of a 3-week history of fever associated with diffuse abdominal pain. Physical examination was unremarkable. No peripheral adenopathy nor palpable abdominal mass was detected. Routine laboratory evaluation demonstrated nonspecific signs of infection including elevation of the sedimentation rate (80 mm/h) and elevation of the C-reactive protein (56 mg/L). The peripheral white blood cell count was normal (9000/mm$^3$). Results of liver function tests were normal. A chest radiograph did not show any abnormality. Abdominal ultrasound examination demonstrated multiple, round, well-defined hypoechoic lesions distributed throughout the liver and spleen. Abdominal computed tomography (CT) showed multiple, round, low-attenuation lesions in the liver and spleen. These lesions were better defined after intravenous contrast administration (Fig. 1). Blood cultures for bacteria and fungi were negative. Serological studies were negative for cytomegalovirus, human immunodeficiency virus, toxoplasma, *Salmonella*, Epstein-Barr virus, *Brucella*, and mycoplasma. Abdominal magnetic resonance imaging showed hepatic and splenic lesions appearing as low-signal-intensity nodules on T1-weighted images (Fig. 2A) and as high-signal-intensity nodules on T2-weighted images. Peripheral enhancement was clearly seen in most of the hepatic lesions on contrast-enhanced T1-weighted images (Fig. 2B).

Further history disclosed contact with many cats at home. The patient's mother had recently acquired a kitten, but the child denied receiving recent scratches or bites. A specific serological test for cat-scratch disease was then performed by using an indirect fluorescent antibody technique. Antibody titers for *Bartonella henselae* were greater than one in 1024, with presence of IgM. The child was treated with Roxithromycine for 1 month and then with Minocycline for 1 month. Despite the disappearance of fever and abdominal pain, follow-up imaging including ultrasound and CT showed a gradual diminution of hepatic and splenic lesions. No remaining lesion was seen on abdominal ultrasound 4 months later.

## Discussion

Cat-scratch disease usually appears as a self-limited febrile illness characterized by cutaneous papules at the site of a cat scratch accompanied by regional lymphadenitis. *Bartonella henselae* has recently been identified as the causative agent, inoculated to humans by the cat scratch or bite of an immature cat. Less commonly, systemic manifestations may occur including Parinaud oculoglandular syndrome, acute encephalopathy, osteolytic lesions, pneumonia, arthritis, and transverse myelitis. The hepatic and splenic involvement was first described in an autopsy series by Inglis and Tonge in 1950 [1]. A few recent case reports have underlined the imaging features of this in-

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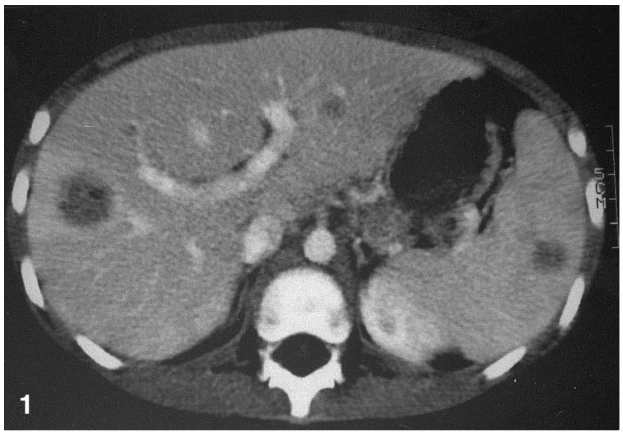


**Fig. 1.** Contrast-enhanced CT shows multiple, round, low-attenuation lesions within the liver and spleen.

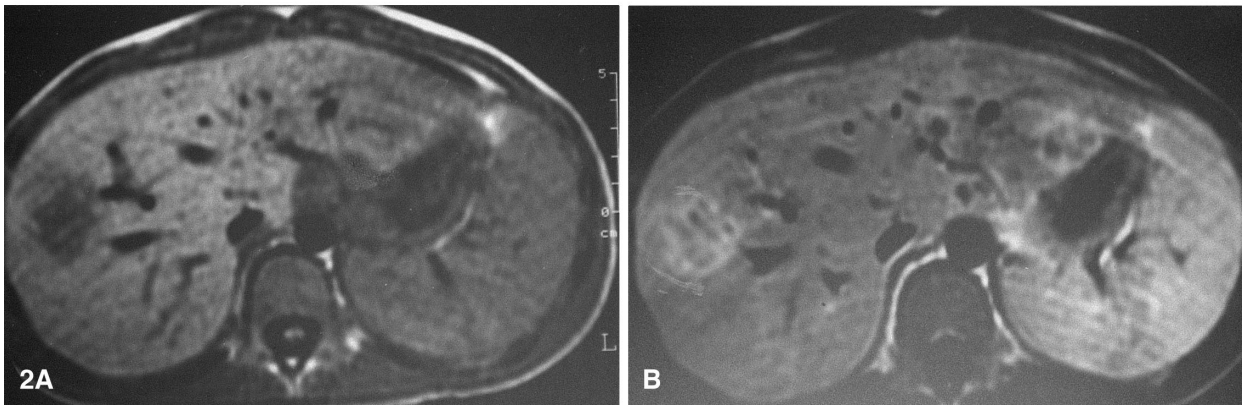


**Fig. 2.A** T1-weighted MR image (TR = 500 ms, TE = 16 ms) shows a low-signal nodular lesion in the right lobe of the liver. **B** T1-weighted MR image (TR = 500 ms, TE = 16 ms) shows a clear peripheral enhancement around the nodular lesions of the liver.

volvement in immunocompetent children with cat-scratch disease [2–5]. The exact prevalence of hepatic and splenic lesions is difficult to state precisely but is probably more common than clinically suspected.

Radiologic features of hepatic and splenic lesions presented by our patient are similar to the few cases described in the recent literature. Abdominal ultrasound displays round, hypoechoic, generally well-defined lesions of different sizes within the liver and the spleen. On CT, the lesions are usually described as low-attenuation lesions, especially after contrast administration. Only one case in the literature underwent a MRI [5]. As in our case, lesions appear as low-intensity nodules on T1-weighted images and as high-intensity nodules on T2-weighted images. Furthermore, a peripheral enhancement was displayed in our case on contrast-enhanced T1-weighted images.

The differential diagnosis includes malignant diseases (lymphoma, metastatic disease), granulomatous diseases (tuberculosis, sarcoidosis), and other infectious diseases (pyogenic abcesses, fungal infections, ascariasis). The key to the diagnosis is based on a history of being scratched or bitten by a cat or kitten. An indirect fluorescent-specific antibody test detecting a humoral response to *Bartonella henselae* is now available to confirm the diagnosis. Further explorations including biopsy may not be necessary. Histopathologic findings (when a biopsy is performed) include vascular proliferative lesions (peliosis) and necrotizing granulomatous lesions [6]. Treatment remains controversial. It is usually admitted that cat-scratch disease may resolve regardless of antimicrobial therapy. However, many observations suggest that antibiotics shorten the course of the illness. Resolution of the radiographically detected lesions may take a few months.

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