Neck abscess secondary to cat-scratch disease

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Abstract

A 7-year-old boy was referred to us for evaluation of an enlarging neck mass. The results of his primary care physician’s initial clinical examination suggested lymphadenopathy secondary to lymphadenitis, and the patient was treated over a 4-week period with two rounds of antibiotics. However, the mass did not resolve, and it subsequently became fluctuant. The patient was referred to our institution, where we diagnosed cat-scratch disease.

Introduction

Cat-scratch disease is a febrile lymphadenopathy often seen in children following exposure to *Bartonella henselae*. The lymphadenopathy is generally self-limiting and does not require treatment with antibiotics. Abscess formation is rare. Other complications are possible, and some do occur in a minority of patients. In this article, we describe a case of cat-scratch disease in a child.

Case report

A 7-year-old boy was referred to us with a 4-week history of a progressively enlarging right cervical mass (figure 1). He had been evaluated by his primary care physician, who started him on amoxicillin. After 5 days of antibiotic treatment, no improvement was noted. One week later, the patient received a second antibiotic for 10 additional days, but improvement was minimal.

On presentation at our institution, the patient denied general malaise, fevers, night sweats, or chills. He did relate a history of exposure to cats at home—his family owned approximately 10 of the animals—but he said he had not been bitten or scratched by any of them. His medical history was remarkable for attention deficit hyperactivity disorder, for which he was taking fluoxetine and amphetamine/dextroamphetamine. His immunizations were up to date.

The patient’s physical condition was remarkable for the presence of a 3.5 × 5.0-cm right cervical neck mass with overlying erythema of the skin and fluctuance. The skin was intact, and there was no evidence of a scratch, bite, or cut in the head and neck region. The patient was admitted to the hospital and started on intravenous erythromycin. He was taken to the operating room, where 8 ml of purulent material was aspirated and drained (figure 2). The aspirate was evaluated by Gram’s stain, aerobic and anaerobic cultures, and Warthin-Starry silver staining (figure 3).

The wound was thoroughly irrigated with normal saline and packed with iodoform gauze. *B henselae* titers were obtained, and the patient was discharged home after a 23-hour stay. The *B henselae* titers were >1:1,024 for immunoglobulin (Ig) G and 1:80 for IgM. The Warthin-Starry stain identified microorganisms (coccobacilli).

Although the patient had earlier denied having been bitten or scratched by a cat, this is the only likely explanation for his condition, and it is probable that he did experience such a trauma but had either forgotten it or not noticed it.

Discussion

The genus *Bartonella* (formerly *Rochalimaea*) is a member of the rickettsial order of bacteria, and it is found worldwide. The most likely mode of bacterial transmission is an infected cat, particularly a kitten. Cat-to-cat transmission is believed to be attributable to fleas. It is not known if fleas can directly transmit cat-scratch disease to humans, but some authors believe such transmission might explain cases of cat-scratch disease in patients who deny having been bitten or scratched by a cat.¹

The two most common sites of regional lymphadenopathy in patients with cat-scratch disease are the upper extremities (46% of cases) and the head and neck region (26%).¹ The lymphadenopathy generally resolves in 2 to 6 months, although it has persisted for as long as 24 months in some cases.¹ Abscess formation does not typically occur. Most cases of cat-scratch disease are seen in patients younger than 20 years, and males are affected more often than females.²,³ Prevalence is higher in the fall and winter.⁴

Cat-scratch disease was first reported by Debré et al in 1950,⁵ but its etiology was not known until Wear et al,⁶ using the Warthin-Starry stain, identified a gram-negative...
bacillus in the lymph nodes of affected individuals in the 1980s. Evidence that *Bartonella* was the causative organism did not accumulate until the 1990s. Diagnosis is based on history, serology, and histologic findings. Culture is reportedly possible but difficult. Two serologic methods can detect antibodies: (1) the indirect fluorescent antibody assay, which has a sensitivity of 88% and a specificity of 97%, and (2) the enzyme immunoassay, which has become less popular in light of the high sensitivity and specificity of the indirect fluorescent antibody assay. Another useful test is the polymerase chain reaction assay, but it is not widely available, primarily because of its high cost.

Histologically, lymph node aspirates are characterized by the presence of small, pleomorphic, gram-negative, argyrophilic bacilli on Warthin-Starry staining. The primary antibody response is noted after the first exposure to a particular immunogen. The time between the exposure and the onset of antibody production is known as the latent phase or lag phase. Production of antibody, primarily IgM, is first noted during the next phase, the exponential phase. This is followed by the steady-state phase and the declining phase; during the latter phase, the production of IgG begins and the production of IgM ceases. A secondary response can occur at some later date following a subsequent immunogenic stimulus. During the secondary response, the production of antibody, particularly IgG, is characterized by a shorter latent period and a stronger, much longer-lasting response that is elicited by memory cells from the first exposure.

Sera from 95% of patients with clinically defined cat-scratch disease contain IgG titers of $\geq 1:64$, and 79% have titers of $\geq 1:256$. IgM titers of $\geq 1:20$ have not been detected in the normal adult population. Our patient had an IgG titer of $>1:1,024$ and an IgM of 1:80, indicating a previous exposure.

IgG cross-reactivity can occur between *B. henselae* and *B. quintana* because these tests use whole bacteria or bacterial lysates as an antigen. Cross-reactivity of IgM between the two species is limited and typically not observed. The clinical presentations differ, however; in addition to cat-scratch disease, *B. henselae* has been associated with peliosis hepatis, and febrile bacteremia syndrome, whereas *B. quintana* has been associated with trench fever in both HIV-positive and -negative patients. Bacillary angiomatosis (a vascular proliferative disease) has been associated with both species; it is more common in HIV-positive patients. Two new *Bartonella* species (*B. clarridgeiae* and *B. koehlerae*)
have been identified in the cat reservoir, but their role in cat-scratch disease or other human pathology needs to be further evaluated.  

Other atypical presentations or complications have been reported in 5 to 13% of patients. Parinaud’s (oculoglandular) syndrome, encephalitis, hepatitis, osteomyelitis, and endocarditis have been observed in immunocompetent patients, and bacillary angiomatosis, bacillary peliosis, and relapsing bacteremia with fever syndrome have been seen in immunocompromised patients.

The bacillus is susceptible in vitro to a wide range of antibiotics, including penicillins, cephalosporins, aminoglycosides, tetracyclines, macrolides, quinolones, trimethoprim/sulfamethoxazole, and rifampin. In one placebo-controlled study, azithromycin therapy was associated with the most rapid diminution in the size of infected lymph nodes, and it has become the first-line choice. Antibiotic treatment is necessary only for highly symptomatic patients, however, because the infection is self-limiting.

References