Diagnosis and Management of Cat-Scratch Disease in Primary Care

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Citation

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Abstract

Cat-scratch disease (CSD) is a relatively common, zoonotic, infectious disease transmitted by young cats that serve as passive vectors for the bacillus Bartonella henselae. Although CSD can affect persons of any age, the condition is most common in previously healthy children and adolescents. Clients with CSD generally present with a positive history of contact with young cats, an inoculation skin papule, and proximal, regional lymphadenitis which can persist for several months. The typical course of CSD is usually benign and self-limiting and requires only supportive therapy. This article discusses the diagnosis and management of uncomplicated CSD in the primary care setting. Recommendations for prevention, reflective of the Centers for Disease Control guidelines, are included.

Because of the seasonal incidence of cat-scratch disease (CSD), advanced practice nurses (APNs) are likely to encounter patients with CSD in late summer, fall, and early winter in various primary care settings. Although complicated or atypical cases of CSD may require a referral to an infectious disease specialist, most cases are easily managed by APNs on an out-patient basis, either independently or in collaboration with a physician. The following case study illustrates such an encounter.

CASE STUDY

SUBJECTIVE DATA

John is a 6-year-old boy who presents, in October, to an ambulatory clinic with a chief complaint of swelling of the neck. His father first noted a large knot behind John's right ear and neck two days prior to evaluation. The knot was noted to have become increasingly tender to touch. Father and son denied any ear pain, fever, vomiting, diarrhea, or change in appetite. John complained only of fatigue. John's past medical history is unremarkable except for three episodes of otitis media over the past year that resolved with antibiotics. Immunizations are current. John is on no medications, and he has no known allergies. Family history is noncontributory. John lives in a rural area in a new home situated on 2 acres of land. The family owns 2 horses, 2 dogs, 3 cats, and 6 kittens. John's favorite animals are the kittens. Approximately 6 weeks ago, John was scratched and bitten by the young mother cat when the child tried to play with her kittens. The incident was forgotten by the family until today's visit. John does not recall any ill effects after the bite, and the father reports no symptoms of fever.

OBJECTIVE DATA

Physical examination revealed a quiet 6-year-old boy sitting comfortably. Oral Temperature was 99.9o Fahrenheit, pulse 92 beats/minute, respiration 22 breaths/minute, and blood pressure 100/70 mm Hg. The physical exam was entirely unremarkable, except for a single, firm, tender, postcervical lymph node on the right side of the neck, measuring approximately 8 cm x 6 cm. Additionally, there was a 1 cm x 1 cm painless, crusted maculopapular lesion behind the right ear, and shotty, nontender postauricular lymph nodes.

LABORATORY DATA

A tuberculosis (TB) skin test was placed on the flexor surface of John's right forearm, and blood was drawn for a Complete Blood Count with differential (CBC) to rule out any other causes of infection. The CBC was normal, and the TB skin test was nonreactive.

TREATMENT AND FOLLOW-UP

John was treated presumptively for CSD with trimethoprim/sulfamethoxazole (TMP/SMX) by mouth twice per day for 10 days. He and his father were instructed to return if any further symptoms developed and/or the lymph node did not regress in size. Approximately 1 month later, John returned to the clinic for an ear infection, and the lymph node was noted to be significantly smaller and painless.

John presents with a classic case of CSD, a zoonotic bacterial infection caused by the organism Bartonella henselae (formerly, Rochalimaea henselae). Initially recognized in 1931, the disease was not well described until the 1980s, when the small, pleomorphic, gram-negative bacilli were identified using the Warthin-Starry silver impregnation stain.[1] Currently available for diagnostic purposes are the serum immunofluorescent-antibody (IFA) test for B. henselae, which has 91% positive predictive value, a 96% specificity, and an 84% sensitivity, and the enzyme immunoassay (EIA) test, which is thought to be the most accurate.[2] Although the CSD skin test has a high degree of specificity and has been used for over 40 years to confirm a diagnosis of CSD,[3] the test is not standardized, is not available commercially,[4] and is no longer recommended.

Cat-scratch disease is usually a benign and self-limiting infection, characterized by the development of an inoculation papule (see Figure 1) 1 to 2 weeks after contact by an infected cat and followed, about 6 to 8 weeks later, by benign regional lymphadenitis proximal to the inoculation site (see Figure 2). Cat-scratch disease is considered one of the most common causes of chronic (greater than 3 weeks duration) regional lymphadenopathy in children and adolescents; 80% of patients with CSD are under the age of 21 years.[5,6]

Figure 1

Figure 1

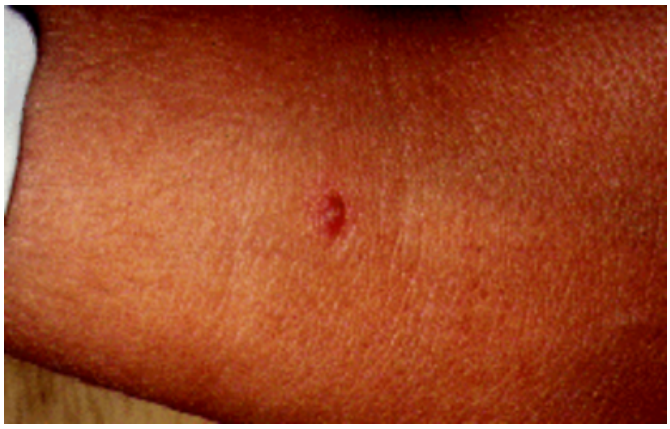
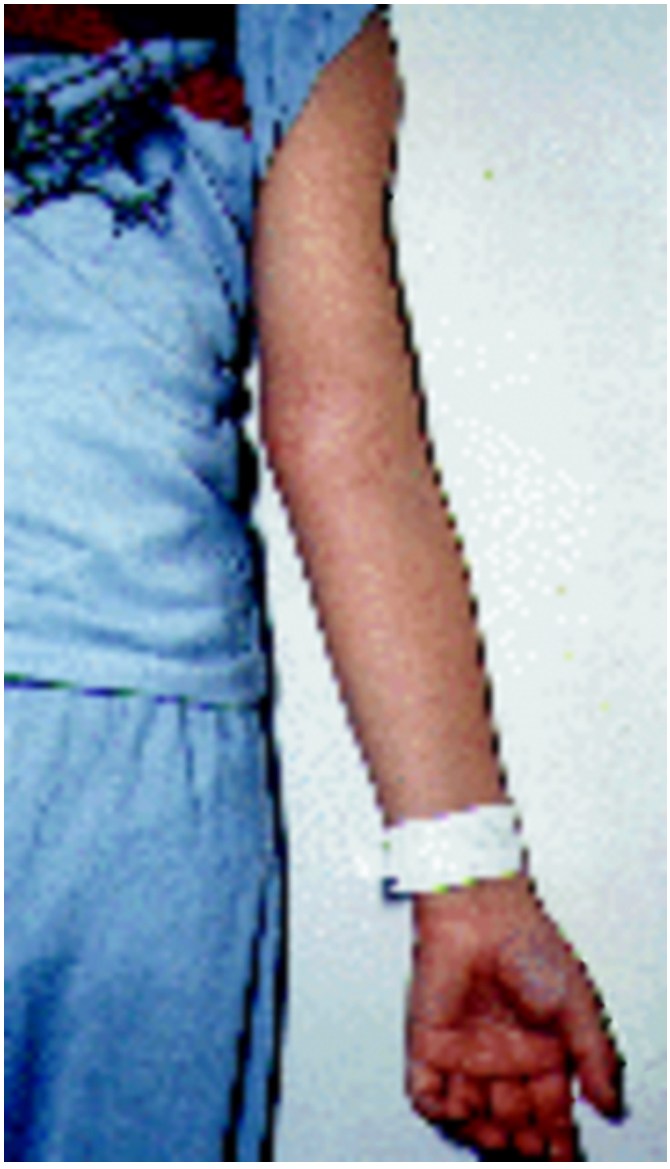


Figure 2

Figure 2



EPIDEMIOLOGY AND TRANSMISSION

Each year, an estimated 22,000 case of CSD occur in the United States, with 2,000 of those cases requiring hospitalization for complications of the disease.[7] Reports indicate that CSD is seasonal, with peaks of the disease occurring in the fall and winter months in temperate climates and extending to July and August in warmer climates. Cat-scratch disease occurs worldwide and all ethnic groups are affected. Males appear to contract the disease more often than do females, and the affected families have a least one cat and most often kittens.

The bacterium is most frequently isolated in young, male cats that are not ill and require no treatment, but that serve as passive vectors in transmitting the disease to humans.[8] Fleas and ticks have also been associated with the transmission of CSD, although more evidence is required to establish ticks as vectors. Transmission of CSD occurs from a bite, scratch, or petting, as a result of direct contact with the cat's saliva. The saliva is deposited on an infected cat's fur and claws from self-grooming.[9]

CLINICAL MANIFESTATIONS

Consistent with John's case history, CSD usually begins, after exposure to an infected cat's saliva, with the development of a small inoculation papule at the site of contact. Inoculation lesions tend to be nonpruritic and heal in several days or months without scarring. Many patients do not recall a cat scratch or bite, and the inoculation papule may be mistaken for an insect bite and quickly forgotten. The inoculation papule progresses through a series of stages: changing from a papule to an opaque, fluid-filled vesicle, then to a crusty, maculopapular lesion, and finally, to a macule which may last several months.[10]

Because children often hold kittens close to their chest and face, most inoculation lesions occur on the upper body, with approximately 80% of enlarge nodes found on the head, neck, and axilla.3 Occasionally, transmission of CSD to the oral mucosa and the conjunctiva may occur by petting an infected cat whose saliva remains on its fur followed by touching the mouth or the eyes.[11] Ocular inoculation lesions present as a nonsuppurative conjunctivitis and/or an ocular granuloma, and oral inoculation lesions present as superficial ulcers (similar to canker sores) prior to the development of lymphadenopathy.1

A positive history of contact with cats and regional lymphadenopathy involving single or multiple nodes proximal to an inoculation site is fairly diagnostic of CSD. Although most CSD patients have single node involvement, lymphadenopathy may occur in more than one site.
Clinicians should suspect that a child may have multiple bites or scratches and look foradditional inoculation lesions. In the initial stages of CSD, regional lymph nodes are approximately 1 cm to 5 cm, but may swell to 10 to 12 cm in the first 2 weeks of the disease, with accompanying erythema, tenderness, warmth, and induration.1 Symptoms of lymphadenitis decrease as the disease resolves. Lymphdenopathy usually regresses in 2 to 4 months; however, large lymph nodes may persist for 1 to 3 years, in rare cases.9 Only about 15% of large lymph nodes become suppurative and require aspiration; incision and drainage of affected lymph nodes is not recommended because of possible chronic fistulization.1

Approximately 50% of patients with CSD experience variable systemic signs and symptoms, which generally occur during lymph node enlargement (see Table 1). Systemic manifestations are usually self-limiting and are treated symptomatically. Atypical signs and symptoms of CSD, which occur in about 10% of all patients, are listed in Table 2. Of all the atypical symptoms of CSD, Parinaud's oculoglandular syndrome is reported as the most common, and CSD encephalopathy (CSDE) as the most serious.2,[12] Parinaud's oculoglandular syndrome is characterized by an ocular granuloma and conjunctivitis associated with swelling of the parotid gland secondary to preauricular and/or submandibular lymphadenopathy.11 Conjunctival lesions are self-limiting and resolve after several weeks.

Figure 3

Table 1: Mild Systemic Symptoms Associated with Typical Cat-Scratch Disease

Fatigue	Malaise
Headache	Pharyngitis
Abdominal pain	Nausea and vomiting
Splenomegaly	Anorexia
Low-grade fever	Chills
Exanthems	Conjunctivitis
Myalgias	Arthralgias

Figure 4

Table 2: Atypical Clinical Manifestation of Cat-Scratch Disease

Parinaud's oculoglandular syndrome	Central nervous system (CNS) involvement
Osteolytic bone lesions	Erythema nodosum
Sepsis	Brain abscess
Bacillary angiomatosis	Bacillary hepatitis and splenitis

With the abrupt onset of convulsions and coma, central nervous system involvement is often frightening to both the patient and the provider. Encephalopathy is usually accompanied by fever and occurs 2 to 6 weeks after the onset of lymphadenopathy.8 Common complications of CSDE include focal or generalized seizure activity, mental status alteration, combative behavior, headache, and coma.12 Most patients with CSDE recover rapidly with no residual neurological sequalae; however, severe, protracted courses require a long hospitalization, aggressive therapy, and a costly diagnostic evaluation.

DIAGNOSIS AND MANAGEMENT

The differential diagnosis of CSD includes all causes of chronic lymphadenopathy. Most causes of lymph node tenderness are related to bacterial infections, such as nonspecific bacterial lymphadenitis, lymphogranuloma venereum, mycobacterial infection, tularemia, tuberculosis, brucellosis, mononucleosis, syphilis, toxoplasmosis, systemic mycoses, sarcoidosis, and nodular lymphomas.2 Cytomegalovirus, Epstein-Barr virus, and Human Immunodeficiency Virus (HIV) usually cause lymphadenitis in two or more body sites.1 Nontender chronic lymphadenopathy occurs primarily with toxoplasmosis, Sporothrix schenckii, and sometimes mycobacterium.9,2 Even with given consideration to the differential diagnoses, most cases of CSD are diagnosed by the following criteria: (a) history of kitten/cat contact with evidence of scratches or bites, (b) inoculation lesions, (c) regional lymphadenitis, and (d) a positive serum IFA or EIA test.1,2 In the event a confirmatory laboratory test is performed and it is negative, the clinician should investigate other causes of lymphadenitis and/or refer the patient for a more complete work-up for CSD including cultures and biopsies of the involved lymph nodes. While the serum IFA and EFA tests are highly reliable and are available for diagnostic purposes through referral centers, they are best conducted at a CDC laboratory (T. Cleary, personal communication, June 20, 1997). Important to note is that most ambulatory settings will not have CSD diagnostic tests available; therefore, many clinicians diagnose presumptively for uncomplicated cases of CSD. A basic laboratory evaluation of CSD should also include a CBC with differential to rule out other causative conditions and a TB skin test to rule out tuberculosis. The erythrocyte sedimentation rate is usually elevated during the initial stages of lymphadenopathy, and the CBC is normal or shows mild leukocytosis.

Treatment for uncomplicated CSD remains controversial, and the literature review reveals differing opinions regarding the use of antibiotics relative to their efficacy, appropriate dosage, and duration of therapy. Generally, CSD is a self-limiting condition with regional lymphadenopathy that spontaneously resolves in approximately 2 to 4 months with no treatment. However, studies suggest that the use of selected oral antibiotics significantly shortens the duration of lymphadenopathy and that these antimicrobials (TMP/SMX, ciprofloxacin) are frequently prescribed in ambulatory practice settings.6,$_{13}$ Although a variety of antibiotics have been used to treat CSD, there are no comparative prospective evaluations of treatment. In a retrospective study of uncontrolled data, Margileth (1992) suggested the efficacy of oral rifamin (87%), ciprofloxacin (84%) TMP/SMX (58%), and intramuscular gentamicin (73%) for improving clinical symptoms. In the same 1992 study, oral rifampin was prescribed using 10 to 20 mg/kg two to three times daily for 7 to 14 days, oral TMP/SMX using 6 to 8 mg/kg two to three times daily for 7 days, and oral ciprofloxacin using 20 to 30 mg/kg twice daily for 7 to 14 days. Intramuscular gentamicin was prescribed for severely ill patients using 5 mg/kg in divided doses every 8 hours for 72 hours. Collipp (1992) reported improvement in 101 children with CSD by treating with 20 mg/kg of TMP/SMX twice per day for 7 days. Paradoxically, children who are immunocompromised appear to respond quite well to common antibiotics, such as erythromycin and doxycycline, prescribed over several weeks or months.1,6

In additional to antibiotic therapy, children may receive supportive therapy for fever, headache, and other systemic symptoms of CSD. Although bedrest is not usually required, some children experience fatigue, and all children with lymphadenopathy

need to avoid trauma to affected nodes through play or athletic activity. Warm moist compresses to affected nodes may decrease swelling and tenderness. Isolation of the affected individual is not required, and there is no evidence that CSD is transmitted by humans.

Atypical or complicated cases of CDS should be referred, and a presumptive diagnosis of CSD in any immunocompromised patient warrants immediate referral to an infectious disease specialist for diagnosis and management. Confirmatory diagnosis may require biopsies of the inoculation lesions and the affected lymph nodes, as well as serologic tests not readily available in primary care settings. Treatment of persistent, large, suppurative lymph nodes may require repeated needle aspiration and parenteral antibiotic therapy.

PROGNOSIS AND PREVENTION

The prognosis for recovery from CSD is excellent. Although the complication of CSD can be serious (central nervous involvement, hematological disorders, boney lesions, and abscesses), they are relatively rare, and most patients with CSD recover fully with no permanent sequalae in a variable period of time from 2 to 24 months. Relapsing Bartonella is rare, and one episode of CSD appears to confer lifelong immunity in children and young adults.6

Families become concerned about the transmission of CSD to other family members by infected cats. Cats seldom infect more than one family member, even though others may have been scratched by the same cat. Periods of transmission are thought to be limited (possibly 2 to 3 weeks), and the cats do not appear ill in any way. Disposal of the offending cat is not recommended, but using good judgment when handling cats and kittens is essential. Young cats and kittens may be most frequently implicated in CSD transmission because they are held more often than are older cats and are less experienced in getting away. Consistent with the 1994 CDC guidelines, parents and cat owners should consider the following recommendations: (a) wash hands after petting or playing with cats; (b) treat animals for fleas and ticks; (c) wash cat scratches, cuts, or bites immediately; (d) never allow cats to lick open wounds; (e) declaw cats if possible; (f) handle cats and all animals gently; (g) instruct children to avoid contact with stray animals; (h) supervise young children, especially toddlers, when handling cats; and (i) ensure routine veterinary care for all pets.

SUMMARY

Cat-scratch disease is a relatively common infectious disease seen primarily in children and adolescents. Clinical presentation may be rather dramatic, with the presence of an inoculation lesion and large, regional lymph nodes in one or more anatomic sites. Diagnostic tests for CSD are available, but CSD is frequently diagnosed by clinical symptoms and a positive history of contact with young cats or kittens. The course of CSD is self-limiting, and lymphadenitis generally resolves in 2 to 4 months with no treatment. Use of oral antibiotics such as TMP/SMX or ciprofloxacin may be helpful in shortening the course in uncomplicated cases managed in the primary-care setting. Referral for atypical or complicated cases of CSD is indicated. Because CSD is seasonal, clinicians may anticipate contact with clients who have symptoms of the disease and should be cognizant of asking about contact with any pets, but especially cats.

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References

1. Margileth AM. Cat-scratch disease. In Behrman R, Kliegman R, Arvin A, editors. Nelson textbook of pediatrics. Philadelphia: W.B. Saunders Company; 1996. p.865-7.
2. Smith DL. Cat-scratch disease and related clinical syndromes. Am Fam Phys 1997;55:1783-9.
3. Margileth AM. Cat-scratch disease. Vet Clin North Am Small Anim Prac 1987;17: 91-103.
4. Zangwill KM, Hamilton DH, Perkins BA, Regnery RL, Plikaytis BD, Hadler JL, et al. Cat-scratch

disease in
Connecticut. Epidemiology, risk factors, and evaluation of a new
diagnostic test. N Engl J Med 1993;329:8-13.
5. Adal KA, Cockerell CJ, Petri WJ. Cat-
scratch disease, bacillary angiomatosis, and other infections due
to Rochalimaea. N Engl J Med 1994;330:1509-15.
6. Margileth AM. Antibiotic therapy for
Cat-scratch disease: Clinical study of therapeutic outcome in 268
patients and a review of the literature. Pediatr Infect Dis
1992;11:372-387.
7. Jackson LA, Perkins BA., Wenger JD.
Cat-Scratch disease in the United States: An analysis of three
national databases. Am J Public Health 1993;83:1707-
11.
8. Carithers HA. Cat-scratch disease: An
overview based on a study of 1,200 patients. Am J Dis in Child
1985;139:1124-33.
9. August JR. Cat-scratch disease. J Am
Vet Med Assoc 1988;193:312-315.
10. Slota M, O'Connor K.
Recognizing and treating cat-scratch disease with encephalopathy
in children. Crit Care Nurse 1992;August:39-42.
11. Tobin EH, McDaniel H. Oculoglandular
syndrome. Cat-scratch disease without the scratch. Postgrad Med
1992;91:207-208, 210.
12. Carithers HA, Margileth AM. Cat-
scratch disease: Acute encephalopathy and other neurological
manifestations. Am J Dis in Child 1991;145:98-
101.
13. Collipp PJ. Cat-scratch disease:
Therapy with trimethoprim-sulfamethoxazole. Am J Dis in Child
1992;146:397-9.
14. Centers of Disease Control and
Prevention. Epidemiologic notes and report: Encephalitis
associated with Cat-scratch disease-Broward and Palm Beach
counties, Florida, 1994. MMWR 1994;43:909-16.

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