

CAT SCRATCH DISEASE

Over 24,000 cases of Cat Scratch Disease (CSD) are reported annually in the United States. CSD used to be an uncommon cause of lymphadenopathy in children and adults, but the incidence seems to be increasing. Fortunately, many advances have been made recently in the detection, isolation and treatment of the causative organism.

Background

Although CSD was first described in France in 1950, the causative agent wasn't definitively identified until the 1990's. The primary culprit is *Bartonella henselae*, but other strains of the *Bartonella* bacillus have also been implicated.

Infected cats have *B. henselae* organisms circulating in the blood, and contaminating the saliva. The organism is transmitted to a human by a cat bite, or transferred to the cat's claws during grooming and then to a human via a cat scratch. CSD is thought to be transmitted among cats by the cat flea. Although the *B. henselae* has been found in cat fleas, there is no evidence that a bite from an infected flea can cause CSD in humans. However, *B. henselae* could be transmitted through flea feces contacting an open wound, because viable bacteria are excreted in the flea feces.

Higher rates of infection are reported in the spring and fall. This is attributed to the seasonal breeding of the domestic cat. It is thought that 40% of cats carry *B. henselae* at some time in their lifetime. CSD is not contagious from person to person. One episode of CSD usually affords life-long immunity, although there have been case reports where a transplant patient or immunocompromised patient is re-infected.

Clinical Features

Once inoculation occurs, lymphadenopathy can arise 4-16 weeks later. Symptoms range from a mild regional lymphadenopathy to a severe inflammatory lymphadenopathy reaction. Tenderness and pain are associated with untreated cases. Fevers are common and there can be associated lethargy, and occasionally sepsis. Sometimes, patients can present with an infectious mononucleosis-like syndrome (fatigue, loss of appetite, headache, rash, or sore throat) or erythema nodosum. Patients usually don't remember being scratched by an animal.

Atypical presentations occur in 5-25% of the CSD cases. Central nervous system involvement includes symptoms ranging from petite mal seizures to encephalitis and neuroretinitis. Hepatitis, splenitis, fever of unknown origin, endocarditis, osteomyelitis and skin involvement have also been documented. There does not have to be associated lymphadenopathy in the atypical presentations.

Laboratory Findings

There are several methods of identification of the causative organism. Genetic variation occurs among *B. henselae* strains, perhaps explaining the inconsistency of some diagnostic techniques.

Serology testing for IgG and IgM titers is the most cost efficient. This test has a sensitivity of 85-90% and specificity of 95%, if paired serum examinations are performed. There is cross reactivity between *Bartonella* species, but differentiation can be accomplished through an indirect immunofluorescent antibody (IFA) test to detect *Bartonella*-specific serum immunoglobulins or through an enzyme immunoassay. Several kits for these assays are now on the market.

Culture is of limited utility, because of the fastidious nature of the organism. It takes several days for cultured bacteria to grow under highly specific conditions and controls. Skin testing is no longer recommended due to its low sensitivity.

In atypical cases (splenitis, hepatitis, neuroretinitis), the use of polymerase chain reaction (PCR) along with serology may be warranted to establish a diagnosis. A gene fragment specific for an enzyme or protein of *B. henselae* can be demonstrated by PCR in most patients with CSD.

Cytopathologic Features

Fine needle aspiration (FNA) biopsy of CSD is usually performed in the setting of patients with lymphadenopathy of unknown (or unsuspected) etiology. Cytopathologic examination of aspirated materials shows characteristic findings. Lymph node involvement is classified into three stages.

The first stage reveals features of a hyperplastic process within the reactive lymph node. Clinically, the patient would exhibit only a focal, slightly enlarged lymph node, which may not be tender, and would have no associated fever or chills. In fact, the patient may not even be symptomatic.

The second stage exhibits suppurative changes. Clinically, the patient would have a grossly enlarged lymph node and adjacent soft tissue swelling. The entire area would be boggy, markedly tender, and occasionally erythematous. Fevers and chills may be present.

The third stage is characterized by necrosis and fibrin deposition with less suppuration. In this stage, the patient exhibits an enlarged lymph node, but it may be decreasing in size slowly. Tenderness is less pronounced, but the bogginess surrounding the involved lymph node may still be present.

Differential Diagnosis

Since CSD is a granulomatous inflammatory disease, the differential diagnosis can be narrowed through the integration of the clinical findings and pathologic features (stage). This can be easily accomplished with a fine needle aspiration (FNA) biopsy.

In the first stage, the differential diagnosis would include a hyperplastic lymph node (reactive); infectious mononucleosis, partially involved lymph node with a malignancy, malignant lymphoma (non Hodgkin's mixed cell type and Hodgkin's mixed cell type).

The suppurative, or second stage differential diagnosis would include lymphogranuloma venereum, mesenteric lymphadenitis, bacterial infections (e.g. staph or strep), and an infarction of a lymph node. Infarcted lymph nodes are commonly seen in association with malignant lymphoma, malignant melanoma, or marked inflammation.

The differential diagnosis of the third necrotizing stage would include Kikuchi's lymphadenitis, tuberculosis, fungi (blastomycosis, histoplasmosis), lymphoma and a cystic squamous cell carcinoma.

Treatment and Prevention

The *B. henselae* is susceptible to several antibiotics, including penicillin, cephalosporins, aminoglycosides, tetracyclines, macrolides, trimethoprim, sulfamethoxazole, and rifampin. Sometimes, the infection resolves spontaneously without intervention of antibiotics.

An ounce of prevention is worth a pound of cure. Children should avoid stray or unfamiliar cats, and avoid any rough play with a familiar cat that could result in a scratch or bite. Also, do not allow cats to lick open wounds on children or adults. Wash hands with soap and water after handling cats/kittens.

Appointments

For further information or to ask questions about a particular patient to determine if the patient is a good candidate for an FNA biopsy, or to schedule an appointment, call the Outpatient Cytopathology Center at 423-283-4734. Our staff will be happy to assist you.

COMPANY PROFILE

OUTPATIENT CYTOPATHOLOGY CENTER (OCC) is an independent pathology practice that specializes in performing and interpreting fine needle aspiration biopsy specimens. OCC is accredited by the College of American Pathologists. The practice was established in 1991 in Johnson City, Tennessee. Patients may be referred for FNA biopsy of most palpable masses as well as for aspiration of non-palpable breast and thyroid masses that can be visualized by ultrasound. OCC is a participating provider with most insurance plans. Our primary referral area includes patients from Tennessee, Virginia, West Virginia, North Carolina, South Carolina, Kentucky and Georgia.

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