



### G18 Rat Bite Fever: A Fatal Case of *Streptobacillus moniliformis* Infection in a 14-Month-Old Boy

Priya Banerjee, MD\*, The Johns Hopkins Hospital Department of Pathology, 600 North Wolfe Street, Carnegie/Pathology 401, Baltimore, MD 21287; and David R. Fowler, MD, and Zabiullah Ali, MD, Office of the Chief Medical Examiner, 111 Penn Street, Baltimore, MD 21201

After attending this presentation, attendees will understand the features of *Streptobacillus moniliformis*, are, under recognized infection as they apply to a forensic setting through an autopsy case presentation.

This presentation will impact the forensic sciences community by highlighting the key features of *S. moniliformis* infection including the clinical presentation, postmortem diagnosis of *S. moniliformis* infection, and risk factors as they relate to a particular forensic autopsy case.

After viewing this presentation attendees will understand the features of *S. moniliformis*, a rare, under recognized infection as they apply to a forensic setting through an autopsy case presentation.

Rat Bite Fever, caused by *S. moniliformis* infection, is an acute syndrome of fever, rash, and migratory polyarthrititis. In the United States, primarily children under the age of 12 years are infected with a total of less than 200 cases reported. Common vectors include rats and mice, which are natural reservoirs. Transmission is predominantly from a bite or scratch, but contact with or ingestion of food contaminated with feces or saliva has also been reported.

A previously healthy 14-month-boy died after a rapid decline after onset of fever and a diffuse rash over his face, trunk, and extremities. Crime scene investigation revealed a disheveled, cluttered bedroom where the child's crib was located. Several markedly soiled animal cages were adjacent to the crib containing rabbits and ferrets. The room was also infested with roaches, flies, and ticks over the floor, walls, ceilings, and all of the bedding. A complete autopsy, including laboratory testing, revealed a well-developed and well-nourished white male infant with normal age-adjusted height and weight. A red-pink macular and mostly confluent rash covered almost the entire body surface with prominence on the head including the scalp, neck, anterior and posterior torso, anogenital region, and portions of the thighs without mucosal involvement. There was sparing of the bilateral legs, soles, palms and portions of the forearms, nose and mouth, except the left lateral corner of the mouth. The rash did not involve the buccal mucosa or gums. The right knee had a donut-shaped bite rash suspicious for a bite mark. Internal examination revealed a mildly enlarged, congested liver and enlarged mesenteric lymph nodes. Microscopic examination of the lungs showed interstitial pneumonitis with rare neutrophils and edema. There were focal areas of gastric aspiration without associated vital reaction. The kidneys had fibrin micro-thrombi with focal fibrinoid necrosis of the tubules, consistent with Disseminated Intravascular Coagulopathy. Microbiologic culture of cerebrospinal fluid was positive for *S. moniliformis* while routine blood cultures were negative. Viral cultures were also negative. Routine toxicologic analysis of heart blood and liver revealed diphenhydramine administered during resuscitation.

In the United States, 55% of cases of Rat Bite Fever occur in children less than 12 years of age. The demographics of the victims have broadened to include children, pet store workers, and laboratory technicians, because the rats have become popular pets and study animals. The infection is associated with a mortality rate of 7-13%, if untreated. The actual rate of infection may be much higher, because it is not a reportable disease. Although easily treatable with antibiotics, the diagnosis and treatment can be delayed due to a broad differential diagnosis which includes meningococcemia, *Staphylococcus aureus* or *Streptococcus pyogenes* septicemia, Rocky Mountain Spotted Fever, or other Rickettsial diseases, enterovirus infection, disseminated gonorrhea, Lyme disease, ehrlichiosis, brucellosis, leptospirosis, and secondary syphilis. Given this differential of more common entities, laboratory identification is essential to proper diagnosis. This paper shows the importance of considering *S. moniliformis* as an etiology.

In all suspected cases, a complete autopsy should be performed and the microbiology lab should be contacted for guidance in submitting blood, cerebrospinal fluid, and probably synovial fluid in appropriate media supplemented with 20% blood serum or ascitic fluid to prevent growth inhibition of *S. moniliformis*.

**Rat Bite Fever, *Streptobacillus moniliformis*, *Actinobacillus muris***