



Pathology Biology Section – 2003

G6 Fatal Capnocytophaga Infection Associated With Splenectomy

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The goal of this presentation is to correctly diagnose fatal sepsis due to *Capnocytophaga* in those at risk. This poster will address the source, site of colonization, and laboratory growth characteristics of *Capnocytophaga*. A clinical case study will be summarized.

Capnocytophaga can cause rapidly progressive sepsis leading to adult respiratory distress syndrome (ARDS), disseminated intravascular coagulation (DIC), and death in splenectomized individuals. The forensic pathologist should be aware of the characteristic features and clinical presentations of *Capnocytophaga* infections in order to make this diagnosis.

This case study involves a 44-year-old male who was taken to the emergency room complaining of "not feeling well" for several days. On admission, he was hypotensive and febrile. He was placed on oxygen, but became progressively worse over a four-hour period. His X-Ray was clear on admission, but four hours later showed changes consistent with ARDS. The differential diagnoses included hantavirus, plague, and tularemia. A Wright stain of the peripheral blood smear revealed rod-shaped intracellular bacterial forms within polymorphonuclear cells. He developed DIC, and died. His medical history included a past motorcycle accident, which resulted in rib fractures, pleural adhesion, and a splenectomy for a lacerated spleen. Socially, he lived in a trailer and spent time outside collecting scrap metal to sell. He hunted squirrels and rabbits, and was recently given a German Shepherd puppy. Several cuts and scratches were observed on his forearms and hands.

Autopsy revealed congested lungs, weighing over 1000 grams each, bilateral pleural effusions, hemorrhagic skin lesions, lymphadenopathy, and status-post splenectomy. At the time of autopsy, cultures were obtained. The slow growing organism *Capnocytophaga* was considered in the differential diagnoses and chocolate agar cultures proved positive.

Canine *Capnocytophaga* is found in normal flora within the oral cavity of healthy dogs and cats. *C. canimorsus* and *C. cynodegmi* can cause localized wound infections and/or systemic infections in people who have been bitten, licked, scratched, or merely exposed to cats or dogs. The cuts and scratches on the decedent's arms may have been the exposure site for the zoonotic infection. Those at highest risk are generally individuals with an underlying disease or condition predisposing them to infection with this organism. Risk factors commonly include previous splenectomy and alcohol abusers, and less commonly chronic obstructive pulmonary disease, pulmonary fibrosis, Hodgkin's disease, hairy cell leukemia, Waldenström's macroglobulinemia, malabsorption syndrome, renal disease, and steroid use (systemic or topical). Because the association with asplenia is frequent, it suggests that the reticuloendothelial system plays an important role in containing the infection. Illness can range from self-limited disease to severe infection characterized by DIC and death. Some of the major clinical features have included cellulitis, meningitis, fulminant bacteremia with septic shock, renal failure, hemorrhagic skin lesions reminiscent of meningococcal disease, pneumonitis with empyema, and bacterial endocarditis. The clinical picture can look identical to meningococcal disease with Waterhouse-Friderichsen syndrome, DIC, purpura fulminans, and symmetrical peripheral gangrene. *Capnocytophaga* has previously been misdiagnosed as plague.

The diagnosis of *Capnocytophaga* is made by culture. *Capnocytophaga* is a fastidious gram-negative bacillus that grows slowly on blood or chocolate agar, leaving a yellow pigment. Because it grows slowly and will not grow on MacConkey's agar, it is advisable to inform the lab that this diagnosis is being considered. *Capnocytophaga* has gliding motility, requires carbon dioxide under either anaerobic or aerobic conditions, and ferments glucose.

In summary, it is important for the forensic pathologist to be aware of *Capnocytophaga* as an organism resulting in overwhelming sepsis and death in splenectomized individuals. A thorough social, medical, and surgical history, clinical presentation, and cultures are important in making the diagnosis of *Capnocytophaga* infections.

Capnocytophaga, Sepsis, Zoonotic