

## A case of *Capnocytophaga canimorsus* brain abscess secondary to dog's bite

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**SUMMARY:** A case of *Capnocytophaga canimorsus* brain abscess secondary to dog's bite.

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*Capnocytophaga canimorsus* has been recognized as an opportunistic pathogen causing systemic infections in immunocompromised individuals. It is part of the normal oral flora of the dog, and can be responsible for localized wound infections in humans in consequence of bites. This microorganism causes also septicemia, meningitis, endocarditis, ocular infections and rarely brain abscess.

We describe the case of an immunocompetent 28-year-old male with temporal brain abscess from *Capnocytophaga canimorsus* secondary to dog's bite.

**RIASSUNTO:** Ascesso cerebrale da *Capnocytophaga canimorsus* per morso di cane: caso clinico.

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*Capnocytophaga canimorsus* è un microrganismo patogeno opportunistico responsabile di infezioni sistemiche in individui immunocompromessi. Fa parte della normale flora batterica orale dei cani e può essere responsabile di infezioni secondarie a morsi. Questo microrganismo può causare setticemie, meningite, endocardite, infezioni oculari ed eccezionalmente ascesso cerebrale.

Presentiamo il caso di un uomo di 28 anni, senza deficit immunitari, con ascesso cerebrale a sede temporale prodottosi a seguito del morso di un cane.

**KEY WORDS:** Brain abscess - *Capnocytophaga spp.* - Central nervous system (CNS) - Infection - Surgery.  
Ascesso cerebrale - *Capnocytophaga spp.* - Sistema nervoso centrale - Infezione - Chirurgia.

### Introduction

*Capnocytophaga species (spp.)* are facultatively anaerobic Gram-negative bacilli that are part of the normal oral flora, and it has been suggested that bloodstream infections develop when *Capnocytophaga* break through the normal mucosal barrier in patients who have severe oropharyngeal mucositis or periodontal disease. Involvement of the CNS occurs in 14% of *Capnocytophaga* infections (1). *C. canimorsus* is typically found as disseminated infection in a host who has undergone a splenectomy, who suffers from alcohol abuse or who is undergoing immunosuppressive therapy. In most cases infection is preceded by a bite or other ex-

posure to dogs but few cases of cerebral abscess are described in immunocompetent patients (2-4).

### Case report

A 28 years-old patient was admitted to our hospital for investigation and management of a suspected brain abscess. At admission the patient was conscious and feverish with neck's rigidity; a week before to presentation to our service he had developed severe headache and a focal convulsive seizure of the left side. In the clinical history there was a dog's bite to the leg, that needed surgical suture and antibiotic therapy in another hospital. The patient was discharged from the hospital and interrupted the therapy few days before the symptoms appearance.

White blood cell count was 18000/mm<sup>3</sup>; the erythrocyte sedimentation rate was elevated at 57 mm/h with increased serum CRP (30mg/dl). RMI showed a ring-enhancing lesion in the right temporal lobe (Fig. 1). Through a right fronto-temporal craniotomy The patient underwent surgical resection of the lesion which yielded purulent fluid (about 8 ml). The patient's symptoms improved rapidly after surgical drainage.

Gram staining of the aspirate specimen resulted in a growth of *Capnocytophaga canimorsus* and the antibiotic regimen immediately started with penicillin G, cefotaxime and metronidazole administered for 2 weeks and continued for 5 weeks. For possible detection of the source of infection, toracic, abdominal and pelvic

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CT scan, a transesophageal echocardiogram, and otorhinolaryngologic examinations were performed, all of which yielded negative. However, a dental examination was normal. Repeated CT scan at the completion of therapy showed resolution of the brain abscess and no neurological deficit and no recurrence was observed during 6 months follow-up.

## Discussion

The genus *Capnocytophaga* includes a group of capnophilic, Gram-negative fusiform bacteria that are part of the normal oral flora in humans and animals (5). Morphologically, *Capnocytophaga spp.* appear as Gram-negative medium-to-long rods with tapered or spindle-shaped ends. The organism is very difficult to cultivate in laboratory. Various techniques have been developed to promote growth, such as the addition of serum to the fermentation medium. Identification of the organism is possible by detecting the reactions in fermentation. These bacteria are capnophilic, requiring extra carbon dioxide for their growth.

The major phenotypic characteristics of *C. canimorsus* include positive tests for oxidase, catalase, arginine dihydrolase, and *o*-nitrophenyl-,*-d*-galactopyranoside and negative reactions for urease, nitrates, and indole. Fermentation of glucose, lactose, and maltose is often observed but not of raffinose and inulin. Growth is often enhanced by the addition of rabbit serum and incubation in a carbon dioxide-enriched medium (6).

In immunocompromised and neutropenic patients, *Capnocytophaga spp.* have been isolated more frequently from patients with bloodstream infections, including bacteremia or meningitis (7, 8), and patients with endocarditis with severe chemotherapy-induced ulcerations. The frequency with which these bacteria have been isolated in large patient series ranges from



Fig. 1 - MRI: right temporal lobe abscess.

0.5% to 3%. Variations in the prevalence, number, and proportion of *Capnocytophaga spp.* have been shown to occur in the dental plaque of pediatric cancer patients undergoing a course of immunosuppressive chemotherapy (9). Infections with this organism may result in a spectrum of manifestations ranging from self-limiting cellulitis to fatal septicemia; most fatal infections occurred in subjects with a history of asplenia, alcoholism, or hematologic malignancy. In general, many antibiotics, including penicillins, clindamycin, macrolides, and quinolones are effective in treating *Capnocytophaga* infections (10) and medical treatment is recommended for at least six weeks.

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