



A Case of leukocytoclastic Vasculitis and Septic Shock due to *Capnocytophaga canimorsus* in a Person without Immunodeficiency

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Abstract

Bite infections caused by *Capnocytophaga canimorsus* are rare. Severe infections are mostly reported in the presence of predisposing conditions (potus, splenectomy, immunodeficiency). We describe the case of a 57-year-old man who developed sepsis associated with purpura secondary to cutaneous vasculitis. The blood cultures were positive for *C. canimorsus*. They have not been documented previous bite injury and immunodeficiency or any other typical predisposition.

Keywords: *Capnocytophaga canimorsus*; Sepsis; Leukocytoclastic vasculitis

Introduction

Case presentation

A 50-year-old man arrived in the emergency room of our hospital because of altered state of consciousness and high fever in the previous 48 h. The patient had medical history of previous ischemic strokes, left internal carotid artery occlusion, dysmetabolic syndrome (obesity, hypertension, dyslipidemia). He was former smoker and he had no familiarity for cardiovascular diseases. The patient at the time of initial examination had petechiae and non-palpable purpura on the trunk and lower extremity (Figures 1-3). He had cognitive slowing, fever (39°C) and hypotension (Pa 90/60 mmHg, Heart rate 100/min), mild basal crepitation. The patient did not have nuchal rigidity or headache. He presented oliguria (400 ml/day); qSOFA (quick Sepsis Related Organ Failure Assessment) was 2.

Initial laboratory results showed mild lymphocytopenia ($0.78 \times 10^9/l$), elevated CRP (312.7 mg/l), acute renal failure (creatinine 2.19 mg/dl, GFR 32 ml/min/1.73mq). INR was normal (1.2).

We formulated the clinical problem (fever, disorientation, purpuric skin lesions), and two diagnostic hypotheses: Autoimmune vasculitis (patient with previous relapsing strokes) or postinfectious vasculitis.

Blood samples were sent for culture.

To test the first hypothesis, markers of systemic vasculitis (ANCA (Antineutrophil Cytoplasm Antibodies), ANA (Antinuclear Antibodies), aPL (Antiphospholipid Antibodies), Cryoglobulins) were negative and blood complement levels was normal. Chest HRCT (High-Resolution Computed Tomography) images showed only subclinical Interstitial Lung Abnormalities. Kidney damage was reversible with hydration (prerenal acute kidney injury).

To test the infective hypothesis (supporting elements: Fever, biological inflammation syndrome and progressive improvement after cephalosporin therapy) blood cultures were positive for *C. Canimorsus*. COVID-19 swab test was negative, as HBV and HCV viruses, RicKettsia, Borrelia, EBV and HIV serology. Two punch biopsy specimens of the patient's right leg (Figure 4a, 4b) and abdomen (Figure 5a, 5b) were obtained.

A mild, superficial perivascular inflammatory infiltrate, Compatible with leukocytoclastic vasculitis was observed at Hematoxylin-Eosin (H&E) staining. Upon further questioning, the patient remembered that he had been licked by his dog, but not bitten (dog was vaccinated).

Assessment of cardiovascular disease shoved

Left internal carotid occlusion unchanged, chronic vascular encephalopathy stable on CT (Computed Tomography), heart ejection slightly reduced on echocardium. *Glycemic* and *lipid* profile

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Received Date: 05 Oct 2020

Accepted Date: 16 Oct 2020

Published Date: 06 Nov 2020

Citation:

Daniela T, Sara R, Chiara I, Maurizio N. A Case of leukocytoclastic Vasculitis and Septic Shock due to *Capnocytophaga canimorsus* in a Person without Immunodeficiency. *Ann Clin Case Rep.* 2020; 5: 1887.

ISSN: 2474-1655

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Figure 1: Multiple erythematous lesions on the right leg of the patient.



Figure 2: Multiple erythematous lesions on the abdomen of the patient.



Figure 3: Multiple erythematous lesions on the trunk of the patient.

was normal. Finally, an episode of high frequency atrial fibrillation (CHDs vasc 2, Hasbled 1) is reported, and Direct Oral Anticoagulant (DOAC) was started. At discharge the patient was asymptomatic. By the eighth day of hospitalization, all cutaneous lesions had almost resolved.

Discussion

Recent literature review [1-3] and two more case reports [1,4,5] reported almost 500 cases of infection by *C. canimorsus*. Mortality was about 25% and incidence 0.5 to 0.7 cases per million people every year. The incubation period of the disease is from 1 to 7 days.

The literature reports that about 80% of patients have predisposing conditions (asplenia, chronic lung disease, lymphoma, potus, and steroid therapy [6]). In this population the bacterium is more aggressive (in fact sepsis, endocarditis, septic arthritis, meningitis, cholecystitis, osteomyelitis, peritonitis, cellulitis, or pneumonia is frequent) [2]. Our patient was not old and he doesn't have predisposing conditions.

In addition *C. canimorsus* transmitted mainly by dog bites but

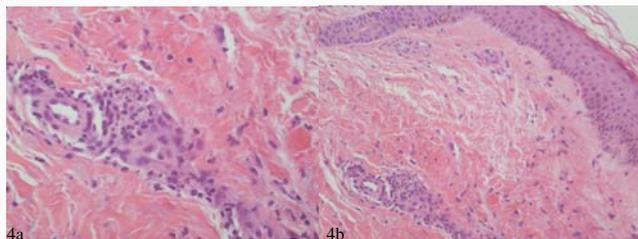


Figure 4a and 4b: Histological features of cutaneous leukocytoclastic vasculitis with infiltrating neutrophils and nuclear dust of the vessel walls in the superficial dermis (Hematoxylin-Eosin A: 20x, B: 40x).

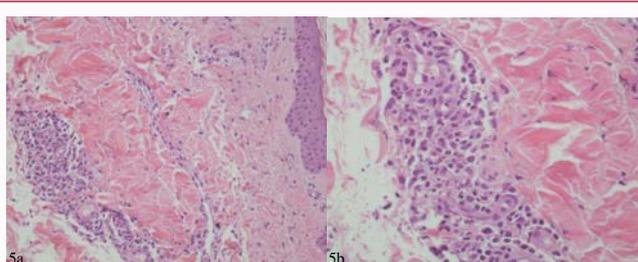


Figure 5a and 5b: Histological features of cutaneous leukocytoclastic vasculitis with infiltrating neutrophils and nuclear dust of the vessel walls in the superficial dermis (Hematoxylin-Eosin A: 20x, B: 40x).

also, rarely, by scratches or only contact with dogs and cats [2]. Indeed our patient had been only licked by the dog. Therefore we think that bacterial concentration was low. Despite this, the patient developed septic shock. We think this is due to the delay of therapy: The patient received antibiotics 2 days after fever and the first signs of bacteremia.

The immune response to *Capnocytophaga* is unclear [2]: It seems that complement is crucial and in fact a human serum with complement inactivated doesn't seem more capable of killing the bacterium [2]. Mortality correlates to the type of infection: low in meningitis (5%) intermediate in bacteremia and sepsis (26% to 36%) [2], greater in septic shock (60%) [2].

Half of infections presented with cutaneous manifestations [5]: petechiae, purpura, cellulitis, gangrene, eschars, while fulminant purpura has rarely been described [1,2], as compartment syndrome [4]; finally there is report of urticarial lesions [5] and Sweet Syndrome [6].

In the presence of petechiae/purpura and infection sometimes with a worsening course, it is necessary to think of *C. Canimorsus* sepsis in differential diagnosis with other germs: *Neisseria meningitidis*, *Rickettsia rickettsia*, *Streptococcus pneumonia* (in patient with asplenia), *Staphylococcus aureus* (in patient with endocarditis), *Enteroviruses*, Epstein-Barr virus, Hemorrhagic fever group viruses. Because of these germs, sepsis can be complicated by Disseminated Intravascular Coagulation (DIC), valsal occlusion, vasculitis, embolisms.

Then petechiae and purpura can be present also in the absence of DIC, as in our patient.

The guidelines for diagnosis and management of skin and soft tissue infections recommend an antibiotic prophylaxis infections are due to dog or cat bites in patients with immunodeficiency, but there is an important systemic manifestation. Antibiotics must have a spectrum covering for aerobic and anaerobic bacteria.

Conclusion

In conclusion, our clinical case description and the literature review seems to confirm that not only dog bite, but also scratches or contact with dogs or cats, should be never underestimated especially if the patient have unusual symptoms (for example flu-like). The patient should promptly undergo a medical examination. *Capnocytophaga canimorsus* infection also should be considered and empirical prompt antibiotic therapy started in the presence of cutaneous manifestation, as cutaneous vasculitis manifested by purpura, even in the absence of animal bites or in the absence of demonstrated immunodeficiency.

Acknowledgement

Dr. Silvia Asioli, Forlì pathological Anatomy Institute.

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