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Letter to the Editor

LETTER TO THE EDITOR

Crescentic glomerulonephritis with anti-PR3 ANCA associated with *Bartonella henselae* infective endocarditis

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Glomerulonephritis associated with infective endocarditis is a form of immune-mediated glomerular injury and frequently presents with acute kidney injury (AKI) and kidney failure [1]. *Bartonella henselae* is a less common cause of endocarditis and occurs in patients with pre-existing valvular disease and cat-exposure. Antineutrophil cytoplasmic antibodies (ANCA) positivity and complement pathway activation in infective endocarditis make diagnosis challenging and treatment choices depend on the autoimmune or infectious origin of the glomerulonephritis [2].

Here we report a case of *B. henselae* infective endocarditis with crescentic glomerulonephritis and the presence of ANCA-PR3.

A 52-year-old male was admitted to the intensive care unit due to acute heart failure. Valvular heart disease was diagnosed with mitral stenosis and aortic regurgitation. Past medical history reported acute rheumatic fever during childhood. He described progressive weight loss, night sweating and low-grade fever. There was a history of travel to Mayotte Island, France and contact with cats.

Physical examination revealed a moderate mitral systolic murmur and complete remission of leg oedema. There was no rash or other systemic signs. On admission, laboratory tests showed stage 3 AKI, proteinuria and haematuria. Results of laboratory investigations are disclosed in Table 1. Repeated samples of blood cultures were negative.

Due to the positive result of ANCA-PR3, cortico-therapy was administered under the suspicion of rapidly progressive glomerulonephritis.

Kidney biopsy showed proliferative glomerulonephritis with C3, C1q and C4d deposits and crescents. Immunofluorescence study revealed diffuse mesangial Immunoglobulin M (IgM) deposits. Cortico-therapy was suspended (Fig. 1).

A transoesophageal-echocardiography showed a 3 mm image of the aortic valve. Positron emission tomography/computed tomography reported spleen enlargement without contrast-uptaking lesions. *Bartonella henselae* serology was positive and polymerase chain reaction test confirmed this infection. A cerebral magnetic resonance imagining (MRI) angiography displayed a frontal lobe microbleed area without evidence of an actual septic emboli.

Doxycycline (6 weeks) and gentamycin (2 weeks) were administered. After sepsis control, cortico-therapy was reintroduced. Kidney function slowly recovered and the patient was dismissed in a good health state. Long-term follow-up showed the same vibratile image on the aortic valve. The last estimated glomerular filtration rate (eGFR) was 39 mL/min/1.73 m² and proteinuria lowered to 0.8 g/24 h.

In a large cohort of patients with biopsy-proven glomerulonephritis associated with infective endocarditis, acute kidney failure was the most common clinical condition and 12% of

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Table 1. Laboratory tests

Creatinine (μmol/L)	346 μmol/L
eGFR CKD-EPI 2021 (mL/min/1.73 m^2)	15 mL/min/1.73 m^2
Proteinuria (g/24 h)	1.8 g/24 h
Haematuria (RBC per HPF)	45
Haemoglobin	7.9 g/dL
HIV, hepatitis C, hepatitis B serologies	Negative
Complement factor 3 (g/L)	0.7 g/L
Anti-nuclear antibody	Negative
Anti-double stranded DNA	Negative
Anti-glomerular basement membrane	Negative
Anti-neutrophil cytoplasmic antibody (ANCA) MPO	Negative
Anti-neutrophil cytoplasmic antibody (ANCA) PR3[a]	Positive
Cryoglobulin	Positive (mixed)

[a] ANCA PR-3 were determined by immunofluorescence testing and flow flurometry (Biorad reactive). CKD-EPI, Chronic kidney disease epidemiology collaboration; RBC, red blood cells; HPF, high-power field.

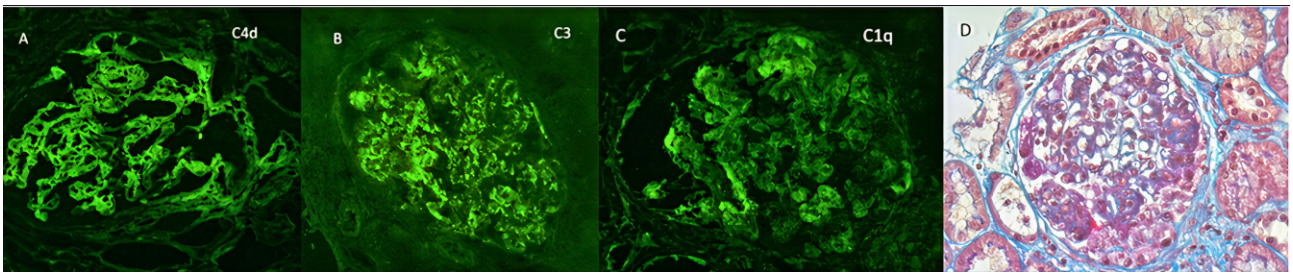

FIGURE 1: Kidney biopsy. (**A**) C4d deposits on immunofluorescence (IF). (**B**) C3 deposits on IF. (**C**) C1q deposits on IF. (**D**) Masson-Trichrome staining, ×400. Mesangial and endocapillary proliferation with cellular crescent and fibrinoid necrosis.

patients had prior valvular disease. *Bartonella henselae* was found in 4/49 patients. More than half of the patients (53%) had a crescentic pattern and C3 deposits were present in 94% of biopsies. Immunoglobulin deposition was heterogenous: IgM staining appeared to be dominant (37%). However, 6% of biopsies were negative for all deposits and only 4% had a pattern of simultaneous IgG, IgM and IgA positivity. Interestingly, immunosuppressive treatment was added to antibiotics in 33% of patients [1]. In another series of 24 patients infected with *Bartonella*, ANCA-PR3 was positive in 83% and glomerulonephritis was found in 92%. [3] Thus, *Bartonella* infection induces a heterogenous auto-immune response and differential diagnosis in this setting may be puzzling. It has been reported that concomitant markers of auto-immunity (e.g. cryoglobulins or low complement) may be more suggestive of bacterial-induced endocarditis [4].

Moreover, in a series of 27 patients with ANCA-positive infective endocarditis with kidney injury, authors reported that *Bartonella* sp. was the most common pathogen (30%) [5].

The main diagnosis to exclude in infectious endocarditis-associated glomerulonephritis is an ANCA pauci-immune necrotizing glomerulonephritis. In order to attempt kidney salvage therapy, particularly in non-responsive patients, immunosuppressive treatment can be offered only after septic control [6].

This case highlights the complexity of diagnosis in the setting of crescentic glomerulonephritis associated with *B. henselae* endocarditis and ANCA-PR3 positivity. Necrotizing glomerulonephritis required corticosteroid therapy that was added after infection control and favourable patient outcome was achieved.

CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflicts of interest.

PATIENT CONSENT

The patient consented to the use of his medical record in order to publish respecting his privacy.

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