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Crescentic Glomerulonephritis following COVID-19 infection: A Report of Pediatric Case

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Case Study: A 11-year-old man visited our hospital with gross hematuria, generalized edema and febrile sense in the 3 days. He has a history of COVID-19 infection two weeks ago and had no symptoms of infection. He confirmed normal urinalysis result at school medical check-up six months ago and had no underlying disease. The patient had fever and high blood pressure of 139/89 mmHg (>95th centile+12mmHg) at the time of admission. The laboratory test results at the first visit were as follows; WBC 14,730/uL, ESR 93mm/h, CRP 6.9mg/dL, BUN 39.4mg/dl, serum creatinine 2.44 mg/dl (eGFR 16.6 mL/min/1.73m²), sodium 130 mmol/L, potassium 5.4 mmol/L, total protein 6.2 g/dL, albumin 3.6 g/dL, calcium 8.3 mg/dL, phosphorus 5.7 mg/dL, uric acid 10.6 mg/dL, spot urine P/Cr ratio 17.5 g/g Cr, 24hr urine protein excretion 7124.7mg/day. Complement was in the normal range and auto-antibodies were all negative. Kidney ultrasonography revealed increased parenchyma echogenicity and swelling state. On the hospital day 2, considering his clinical presentation of rapid and progressive AKI with gross hematuria, proteinuria and hypertension, methylprednisolone pulse therapy was started, and renal biopsy was performed the next day. The renal biopsy specimens showed crescentic immune complex glomerulonephritis. On immunofluorescence microscopy, IgA, IgG and C3 were observed within the mesangial matrix of glomeruli. Electron microscopy revealed many subendothelial & mesangial electron dense deposits, many leukocytes in the capillary lumens (endocapillary proliferation), extensive foot process effacement with microvillous transformation and intraluminal leukocyte. Therefore, we diagnosed this patient as Post COVID-19 infection associated de novo crescentic immune-mediated glomerulonephritis and continued oral prednisolone and cyclophosphamide treatment after MP pulse therapy. He is currently on medical treatment for 5 weeks and is gradually recovering his renal function with eGFR 32 mL/min/1.73m².