Clinical Case Study

A Patient with a Leg Rash, Pedal Edema, Renal Failure, and Thrombocytopenia

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CASE

A 57-year-old man was referred for assessment and management of malaise and leg edema, which had increased 2 weeks after the onset of a productive cough, for which clarithromycin had been prescribed. His course was complicated by the development of a pruritic skin eruption. The patient's medical history included type II diabetes mellitus of 5 years' duration and stage III chronic kidney disease. He also had a chronic infection with hepatitis C virus (HCV)[6] (genotype 1A) and had been lost to follow-up for the previous 19 years. Medications included antihypertensive drugs (calcium channel blocker, β-blocker, angiotensin-converting enzyme inhibitor, and furosemide), a lipid-lowering drug (ezetimibe), analgesics (hydromorphone HCl and acetaminophen), and ipratropium bromide aerosol. A physical examination revealed the following: blood pressure, 140/65 mmHg; pulse, 55 beats/min; temperature, 36.9 °C; oxygen saturation, 94% on room air; body mass index, 46 kg/m^2. Abdominal distention was noted and felt to be compatible with the presence of ascites. The spleen was palpable. There was bilateral lower-extremity pitting edema and a hyperpigmented pretibial rash that was not palpable.

Initial laboratory investigations included typical findings for electrolytes, aspartate aminotransferase, alanine aminotransferase, total bilirubin, and the international normalized ratio. The patient's laboratory test results are summarized in Table 1. His fasting plasma glucose concentration was impaired, and his alkaline phosphatase was slightly raised. The patient was anemic and thrombocytopenic with hypoalbuminemia and an increased serum creatinine concentration. A urinalysis dipstick screen and a microscopy evaluation revealed hematuria, proteinuria, and the presence of red blood cell casts in the urine. A 24-h evaluation of urine protein excretion confirmed an abundance of protein in the urine. The glomerular filtration rate, as estimated with the Cockcroft–Gault equation, was very low. An ultrasound analysis revealed bilateral echogenic kidneys of typical size. In the setting of a chronic, untreated HCV infection and evidence of nephrotic syndrome, a cryocrit was requested to investigate the possibility of membranoproliferative glomerulonephritis secondary to cryoglobulinemia. A renal biopsy demonstrated diffuse, proliferative glomerulonephritis and immune-complex deposits.

Questions to Consider
• What is the approach to an adult with the diagnosis of nephrotic syndrome?
• What are the primary and secondary renal pathologies that may be seen in adult glomerular disease?
• Which tests could be ordered to help differentiate the cause of this patients' renal disease? Discuss specimen collection and handling requirement.

DOI: 10.1373/clinchem.2008.116541

Table 1. Initial and follow-up patient laboratory results with corresponding reference intervals.[a]

Analyte	Result	Reference interval
Initial investigation		
Fasting plasma glucose, mmol/L	6.1 (110 mg/dL)	4–6 (72–108 mg/dL)
Alkaline phosphatase, U/L	146	≤110
Hemoglobin, g/L	117 (11.7 g/dL)	140–180 (14–18 g/dL)
Platelet count, $\times 10^9$/L	108	150–400
Plasma albumin, g/L	29 (2.9 g/dL)	38–50 (3.8–5.0 g/dL)
Plasma creatinine, μmol/L	334 (3.8 mg/dL)	Male, ≤109 (1.2 mg/dL); female ≤99 (1.1 mg/dL)
Urinalysis	Red blood cells (+2), protein (+5)	Negative
Urine protein, g/day	8	<0.15
Glomerular filtration rate, mL/min	<15	≥90
Follow-up		
C3, g/L	0.90 (90 mg/dL)	0.9–1.8 (90–180 mg/dL)
C4, g/L	0.08 (8 mg/dL)	0.1–0.4 (10–40 mg/dL)
Cryocrit, %	5	Negative <5
Hepatitis B core antibody	Positive	Negative
Hepatitis B surface antibody	Positive	Negative
Hepatitis B surface antigen	Negative	Negative
Hepatitis C virus RNA, $\times 10^3$ IU/L	62	Cutoff <15
HIV antibody	Negative	Negative

[a] Data in conventional units are in parentheses.

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the July 2009 issue of *Clinical Chemistry*. To view the case and comments online, go to http://www.clinchem.org/content/vol55/issue7 and follow the link to the Clinical Case Study and Commentaries.

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