LSUHSC-S Renal Pathology Consultative Services
Interesting Case

Case Study #: 12
01/18/10 Answers

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Clinical History: Patient is a 39 year old female with a history of hypertension, diabetes, gout, pyelonephritis, and CAD. She presented with an increase in creatinine (3.5) and proteinuria following a recent history of a chronic inflammatory demyelinating polyneuropathy for which IVIG was given. Renal biopsy was performed on day 5 after the cessation of IVIG therapy.

Case courtesy of Dr. Venkatesh Reddy, MD

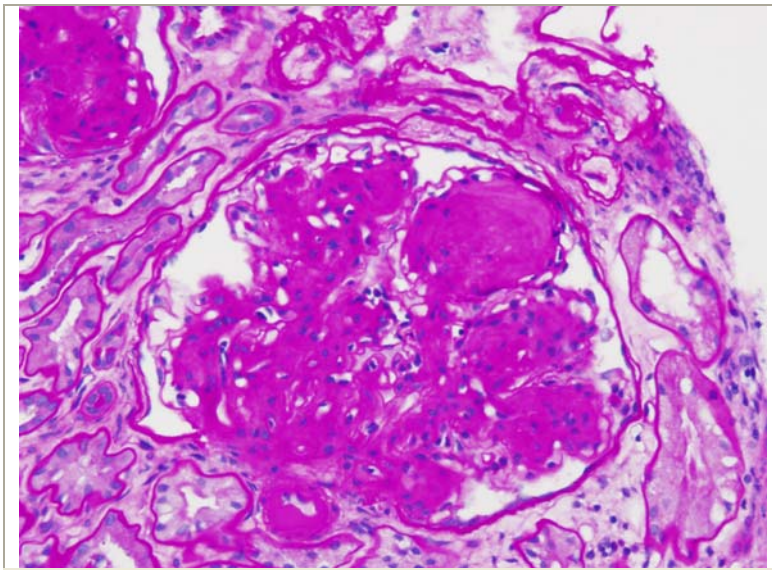

Figure 1: PAS stain of a glomerulus

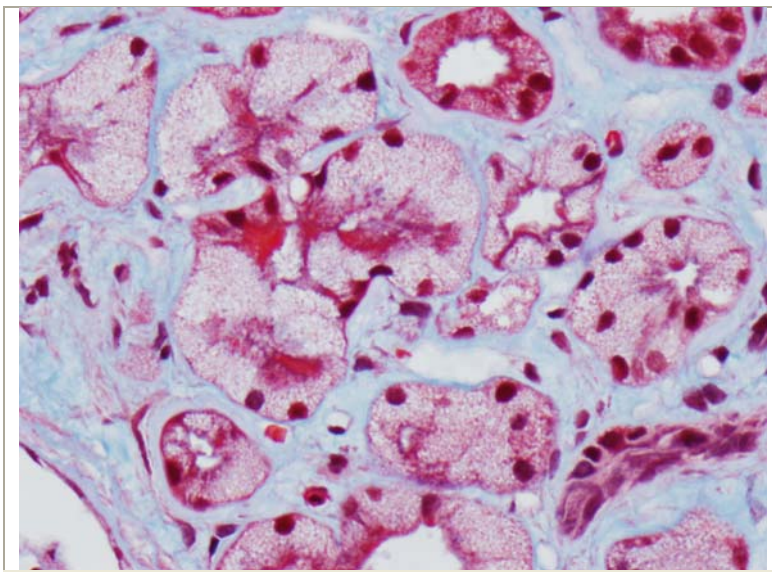

Figure 2: Trichrome stain of the renal tubules

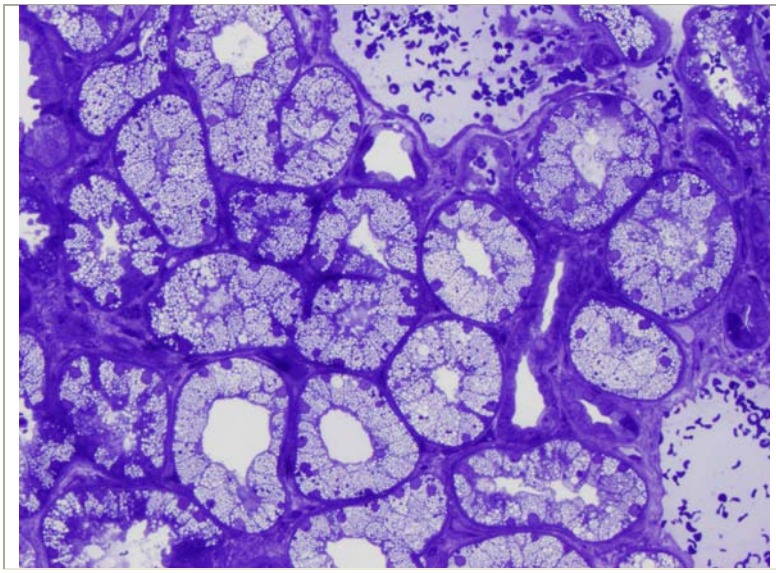

Figure 3: One micron EM thick section of the tubular abnormality

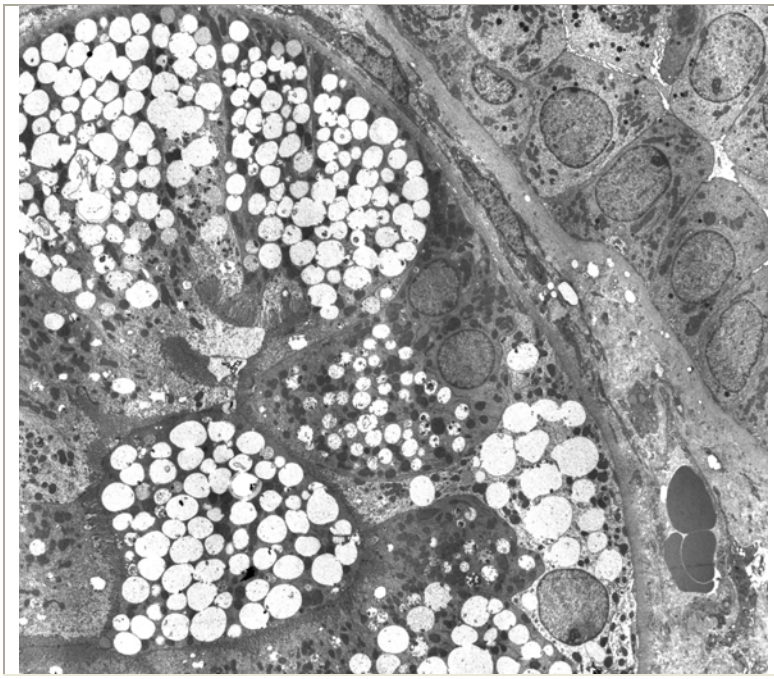

Figure 4: EM of the renal tubule

Answers:

1. **What is the glomerular abnormality?**

   The LM of a glomerulus shows severe nodular and diffuse mesangial matrix increase with segmental nodule formation indicative of severe diabetic glomerulopathy.

2. **What is the renal tubular abnormality?**

   On LM, the proximal tubular cells show marked swelling and vacuolization with a relative preservation of the brush border.

   The EM of a tubule also highlights the extensive vacuolization

	throughout the cell. **Since this patient had a recent history of IVIG administration prior to the increase in creatinine and proteinuria, it is likely that the tubular changes reflect IVIG nephrotoxicity.** **IVIG has been widely used in the treatment of numerous autoimmune hematologic, neurologic, rheumatologic and cutaneous disorders. It is prepared from pooled plasma and a number of substances are added to stabilize the immunoglobulin solution, which include albumin, sodium acetate, glycine and sucrose. The majority of cases of acute renal failure reported in the U.S. have been associated with products containing the highest concentration of sucrose.** **Osmotic injury to the proximal renal tubules is the proposed mechanism of acute renal failure as tubular immunoglobulin deposition has not been demonstrated. Proximal tubular cells are unable to hydrolyze sucrose, and therefore it accumulates and causes the entry of water through an osmotic gradient.** **The clinical course ranges from asymptomatic elevations in serum creatinine to acute renal failure. When IVIG is discontinued, renal recovery is rapid.**
References:	Tsinalis D, Dickenmann M, Brunner F, Gürke L, Mihatsch M, Nickeleit V. Acute renal failure in a renal allograft recipient treated with intravenous immunoglobulin. Am J Kidney Dis 2002; 40:667-70. Haskin JA, Warner DJ, Blank DU. Acute renal failure after large doses of intravenous immune globulin. Ann Pharmacother 1999; 33: 800-3. DOI 10.1345/aph.18305. Cantu TG, Hoehn-Saric EW, Burgess KM, Racusen L, Scheel PJ. Acute renal failure associated with immunoglobulin therapy. Am J Kidney Dis 1995; 25:228-34.http://www.theannals.com/cgi/external_ref?access_num=7847349&link_type=MED Tan E, Hajinazarian M, Bay W, Neff J, Mendell JR. Acute renal failure resulting from intravenous immunoglobulin therapy. Arch Neurol 1993;50:137-9.http://www.theannals.com/cgi/ijlink?linkType=ABST&journalCode=pharmther&resid=33/7/800 Pasatiempo AMG, Kroser JA, Rudnick M, Hoffman BI. Acute renal failure after intravenous immunoglobulin therapy. J Rheumatol 1994;21:347-9