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On the Cover

What's the Diagnosis? Renal biopsy reveals osmotic nephropathy associated with intravenous Ig (IVIg). Osmotic nephropathy describes a morphologic pattern with vacuolization and swelling of the renal proximal tubular cells, which can result from sucrose (stabilizer in IVIg), hydroxyethyl starch, dextrans, mannitol, and contrast media. The clinical spectrum includes both AKI and CKD, but the process can develop and resolve without any obvious kidney injury. Patients with preexisting acute kidney disease or CKD are at greatest risk to develop this lesion because of their decreased ability to degrade and excrete the causative agent. Primarily straight and sometimes convoluted proximal tubules are involved, whereas distal tubules and collecting ducts are spared. The exogenous substances enter cells through pinocytosis whereupon the pinocytotic vacuoles fuse with each other and lysosomes, which fill the cellular cytoplasm. Cell swelling was initially thought to be caused by osmotic effects of the pinocytosed hyperosmolar substance but was subsequently shown to result from the large number of vacuoles and lysosomes. Over time, vacuolization resolves; however, it may persist and be associated with tubular atrophy, interstitial fibrosis, and inflammation. Osmotic nephropathy should be considered when AKI develops in patients who received infusions of the above noted exogenous solutes. (Photo courtesy of Mark A. Perazella Yale University, New Haven, Connecticut)

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