CYTOMEGALOVIRUS GLOMERULITIS WITH SECONDARY TUBULAR DAMAGE IN A RENAL ALLOGRAFT.

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Objectives: Cytomegalovirus (CMV) glomerulitis due to direct infection of the renal allograft has been a controversial topic, with only a few cases published to date. CMV rarely causes an immune complex-mediated glomerulitis and may also cause acute transplant glomerulopathy, but is usually associated with pure tubulointerstitial nephritis. Differentiating an acute viral infection with associated tubulointerstitial nephritis from acute rejection can be difficult. A related problem is differentiating a pure viral infection from a viral infection with synchronous acute rejection. This is especially problematic in follow-up biopsies performed after treatment of the infection, which includes reduced immunosuppression. We describe a confirmed case of CMV glomerulitis in a renal allograft with secondary tubular damage from the resulting proteinuria.

Methods: A 51-year old African-American male (CMV-) underwent a cadaveric renal transplant (CMV+) for end stage renal disease secondary to hypertension and suspected, but undocumented focal segmental glomerulosclerosis. 2.5 months post-transplantation the patient presented with sinusitis and malaise with increased serum creatinine (2 mg/dL). The microalbumin-to-creatinine ratio was 1,973 and the CMV viral load 91,700 copies/ml. A biopsy was performed. Mycophenolate mofetil was held, prednisone and Tacrolimus were continued, and treatment with IV ganciclovir was begun. Repeat biopsy was performed 13 days later, because of poor clinical response. The microalbumin-to-creatinine ratio had increased to 3,940 with a serum creatinine of 3.9 mg/dL.

Results: Light microscopy on the 1st biopsy revealed a few nuclear and rare cytoplasmic inclusions in glomerular cells. Colorimetric in situ hybridization (CISH) and immunohistochemical staining (IHC) for CMV were both positive in rare glomerular cell nuclei. One atypical cell examined ultrastructurally demonstrated characteristic cytoplasmic virions. Minimal tubulointerstitial abnormalities were present. The 2nd biopsy had increased glomerular involvement by CMV, with more neutrophils and rare foci of associated early segmental sclerosis. One or two tubular epithelial cells had equivocal inclusions, but large groups of proximal convoluted tubules were engorged by protein resorption droplets with occasional mitotic figures. Interstitial inflammation was minimal. ISH and CISH were confirmatory of glomerular CMV only.

Conclusions: This report confirms that CMV can primarily involve the glomeruli in the renal allograft. Ultrastructural confirmation of glomerular CMV is presented for the first time, to our knowledge. Some cases of pure CMV infection of the renal allograft can be separated from acute rejection by the lack of a significant interstitial inflammatory infiltrate, and when another cause for the tubular damage is found. In the case reported here, the damage appears to be due to accumulation of protein resorption droplets in proximal convoluted cells, secondary to CMV glomerulitis.