

PROPOSED PATHOPHYSIOLOGY OF ACUTE KIDNEY INJURY FOLLOWING RETROGRADE PYELOGRAPHY

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Acute kidney injury after retrograde pyelography is rare, and very few cases have been reported since the 1960's. We describe a case of biopsy proven acute tubular necrosis (ATN) following retrograde pyelography. Other causes of ATN were excluded. We review the literature and discuss the proposed pathophysiologic mechanisms.

A 64-year-old male, with a history of myelodysplastic syndrome, presented with suprapubic cramping and hematuria. Forty eight hours prior to admission, he had undergone retrograde pyelography for hematuria. Laboratory data showed an elevated creatinine of 2.8 mg/dl from baseline value of 1.0 mg/dl. Due to a progressive rise in serum creatinine (6.2 mg/dl), anuria, and exclusion of obstruction, a kidney biopsy was performed. It revealed acute tubular necrosis. He was treated with intermittent hemodialysis for 3 weeks before his serum creatinine and urine output returned to baseline.

We reviewed the English language literature and found 22 reports on anuria post pyelography. *We were unable to obtain 2 reports mentioned as references of the reviewed articles.* The first report was published in 1922 by Morton, after bilateral pyelography using sodium bromide for contrast. Proposed mechanisms were reviewed and summarized.

(1) Reflex anuria due to a neurogenic mechanism initiated with ureteric manipulation (*Wolf 1945, Quilter 1953, Moore, 1954, Shearlock 1976, Hayyashi 1996*). (2) Traumatic edema of the ureteric orifices (*Burros, Cohen, 1956, Sirota 1957, Hope 1958, Sigman 1963*). (3) Pyelolymphatic backflow (usually painful) causing interstitial edema and increased interstitial pressure, with reduced GFR and renal tubular hypoxia (*Grieve 1955, Epstein 1965, Alfrey 1967, Hurley 1979, Chiu 2003*). (4) ATN seen on kidney biopsy (*Whalley, 1987*) (5) Papillary necrosis (*Eskelund 1945*).

We postulate in our patient the etiology to be direct tubular toxicity resulting from pyelolymphatic reflux of contrast that is locally reabsorbed. We suggest that the reflux should be specifically looked for. If seen, especially in patients at risk for contrast nephropathy, we recommend preventive measures to help reduce the risk of kidney injury.