

# AKI, Gross Hematuria, and Crystalluria: Rare Side Effects of a Very Common Drug

Bethsy Daverman MD; Stefan Mann MD; Moussa Wassim MD; Scott Lang MD; Jerry W Sayre MD FAAFP

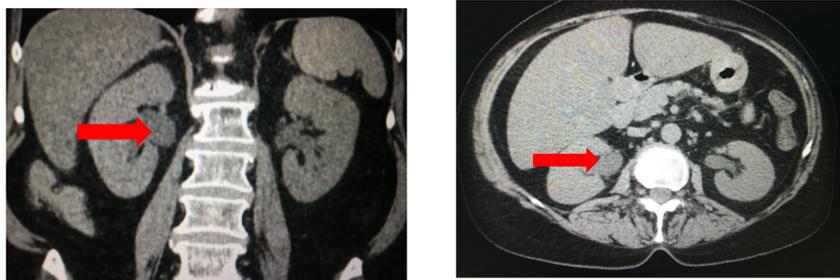
## Case Report

A 63-year-old female was treated in the emergency department (ED) of a community teaching hospital for acute abdominal pain without urinary symptoms and a working diagnosis of acute diverticulitis confirmed by abdominal computer tomography (CT). Initial laboratory evaluation demonstrated normal renal function. Initial treatment started in the ED included IV Piperacillin/Tazobactam 3.375mg every 6 hours (total 6 doses), and single dose of IV 500mg Metronidazole. The patient was discharged in less than 24 hours on oral AC 875/125mg every 12 hours for 5 days. Three days later, she returned to the ED with suprapubic pain, gross hematuria, and anuria which the patient described as “I can’t pee and when I do, I’m only passing bloody urine with clots.” Subsequently, she was admitted to the Family Medicine inpatient service for acute kidney injury with anuria. CT scan revealed a newly developed bilateral hydronephrosis with an empty the bladder, confirmed by bedside bladder scan. Foley catheter was inserted for accurate urine output monitoring and given supportive fluid, and ceftriaxone for empiric treatment for presumed urinary tract infection. Urology was consulted who performed cystoscopy, bilateral retrograde pyelography, and ureteroscopy, with the insertion of bilateral 24cm 6-french double pigtail ureteral stents. Urology confirmed the clinical suspicion of bilateral hydronephrosis, cystitis, gross hematuria, and observation of hyperemia around both ureteral orifices along with small clots exiting the ureteral orifice bilaterally. No active source of acute bleeding was found in the examined lower urinary tract. Microscopic urinalysis demonstrated TNTC RBC, 10-20 WBC; unfortunately, no specialized microscopic examination was performed to reveal amoxicillin-crystalluria. A coagulopathy workup was normal.

## Laboratory

Times Days	4 days prior to admission Pre-Oral AC	4 hours prior to Admission in ED -Post 5 doses of oral AC	Day of admission	3 hours post admission	12 hours post admission -intervention day Ureteral stents	12 hours post intervention	Post procedure Day-1	Post procedure Day-5 Discharge home
Creatinine	0.60	1.21	1.35	1.82		1.02	0.43	0.46
GFR	84	45	39	28		55	148	137
BUN	9	5	5	5		7	4	5
Urine output	Within normal adult range	Anuria	oligo	0	(1-hour post intervention) 800mL	Within normal range	adequate	adequate
Hematuria	neg	n/a	+	n/a	+	+	Pinkish color	Clear yellow
Urine analysis	Color: yellow Appear: clear pH: 6.0 SG: 1.010 Glucose: neg Protein: neg Nitrite: neg Esterase: neg		Color: Red Appear: Turbid pH: 6.0 SG: 1.008 Glucose: neg Protein: moderate Nitrite: Pos Hemoglobin: Large Esterase: small RBC: TNTC WBC: 11-20 Bacterial: few					
UDS	Negative							
Urine culture			negative					
Throat culture	Negative		Negative					
Blood culture	Negative		Negative					
Stool culture			Negative for C. Diff					
Alcohol quant	295	<10.0						
Hydro-Nephrosis Hydro-Ureter	Not present Per CT scan	Present Per repeat CT scan			Present			Present but Improved Per kidney US
Hgb/hct	12.9/37.0	12.4/36.4	12.5/36.3			11.6/34.5	10.3/30.5	10.3/30.2

## Imaging



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## Hospital Course

On hospital day four, the ureteral stents were removed and she had complete resolution of hematuria with return to baseline kidney function. The patient was discharged home on oral antibiotics and urology follow up. The discharge diagnosis was acute kidney injury with gross hematuria and proteinuria causing obstruction with bilateral hydronephrosis and secondarily causing urinary tract infection as evident by positive nitrites. Definitive diagnosis to crystal-induced AKI is made via biopsy. However, clinical diagnosis is attained based on history of exposure to a known drug induced-crystals [7]. Therefore, based on the clinical course, we conclude that our patient had AC crystal-induced nephrotoxicity.

## Discussion

Amoxicillin is one of the most commonly prescribed antibiotics worldwide. Hematuria, crystalluria, acute kidney injury and oligo-anuria have been described as occurring through tubular destruction of the kidney secondary to AC [1]. Clinically, this presentation is rare, and usually appreciated in high intravenous/oral administration and overdose [2], not with commonly prescribed doses as was observed in our patient.

## Conclusion

Amoxicillin/Clavulanate (AC) is reported in the literature causing hematuria and crystalluria on supratherapeutic dosing. We present a case of a rare but potentially serious adverse reaction of AC in an adult person with hematuria, oligo-anuria, and reversible acute kidney injury on the third day of standard oral dose of AC. As Amoxicillin is a commonly prescribed antibiotic in our practices, Family physicians are aware of the common side effects, but we wish to educate and inform Family Physicians of this rare and serious adverse drug reaction.