Post Renal Severe Acute Renal Failure with an Optimal Outcome: A Case Report

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Abstract

Obstructive uropathy occurs when urine cannot drain out the kidney. Symptoms differ whether the problem starts slowly or suddenly, and if unilateral or bilateral kidneys are affected. One of the most common causes of obstructive uROpathy is kidney stones. Here we report a case of a 47-year-old male patient with bilateral kidney stones and severe creatinine rise and how he was managed acutely and definitely.

Keywords: Stones, Acute injury, Obstructive uropathy.

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Introduction

Obstructive uropathy occurs when urine cannot drain out the kidney. Urine backs up into the kidney and causes it to become swollen (hydronephrosis). Symptoms differ whether the problem starts slowly or suddenly, and if one or two kidneys are affected. One of the most common causes of obstructive uropathy is kidney stones. Definite diagnosis relies on imaging the patient. Urinary tract computed tomography (C.T) scan without contrast remains the gold standard. Short-term relief from the blockage is possible without surgery. However, after stabilizing the patient condition the cause of the blockage must be removed and the urinary system repaired. As few cases have been described in the literature so far, whose creatinine levels reached that much sky-high level, our aim was to add one more case to the literature, describing symptoms, diagnostic evaluation and treatment options and to report the good response after management on short and long term follow up and to allow comparing the outcome to reports found in recent literature.

Case Presentation:

A 47-year-old male presented with complaints of left flank pain along with nausea, vomiting and dysuria for 2 weeks. He denied fever, hematuria, weight loss, or fatigue. Review of systems was insignificant. The patient does not have any medical problems and was not taking any medication. He is allergic to ceftriaxone and vancomyin. There was anuria since 1 day.

Routine blood investigations revealed

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deranged renal function tests, blood urea was 507 mg/dL and serum creatinine was 52.6 mg/dL with missing information about his baseline values, Potassium was 6.4 mmol/L and phosphorus level (14.71 mg/dL). White blood cells count was normal (5.74 cells/mcL). Urine analysis showed numerous white blood cells (WBC), red blood cells (RBC) and bacteriuria.

Electrocardiogram (ECG) and arterial blood gas (ABG) levels were within normal range.

Plain kidney, ureter, bladder X-ray (KUB) and a urinary tract C.T scan of the abdomen and pelvis without contrast revealed multiple left renal stones, the largest was 2 cm in diameter with marked hydronephrosis and cortical thinning and a solitary right renal stag horn stone with moderate hydronephrosis (Figure 1 and 2).

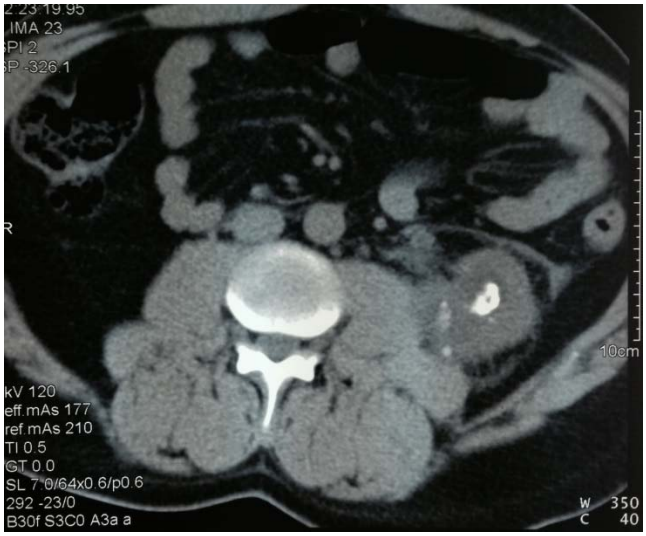

Figure 1: Urinary tract CT showing left renal pelvis stone causing severe hydronephrosis

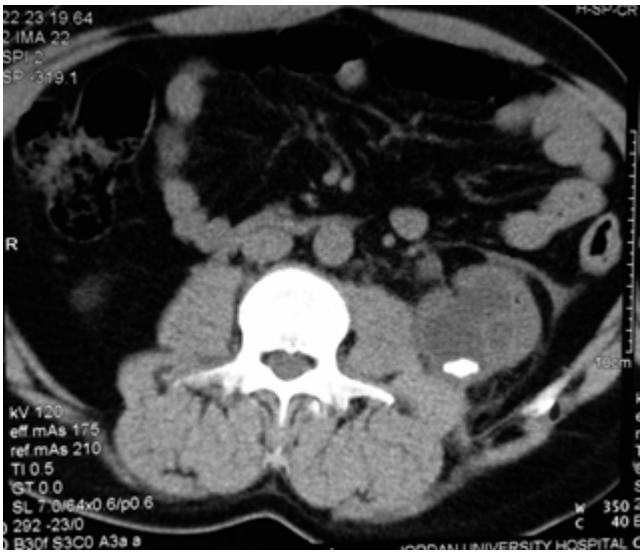

Figure 2:Urinary tract CT showing left renal lower calyceal stone with severe hydronephrosis and cortical thining

Figure 3: KUB showing left nephrostomy with bilateral ureteral stents

Patient was admitted to urology service for stabilization, intravenous antibiotics and hydration. C.T-guided bilateral percutaneous nephrostomies were inserted under local anaesthesia using 9F nephrostomy tube, first on left side, and 3 days later on the right side.

Subsequent urine output was 1500–2000 ml on both sides. Appropriate fluid replacements were made and miraculously serum creatinine dropped down to 7 mg/dL after just one week of diversion and to 4 mg/dL by 2 weeks, it stabilized to around 2 mg/dL after 4 months.

Two weeks later and after stabilization of the patient condition, he was subjected to endoscopic bilateral ureteral stent insertion and right nephrostomy removal on the same session (Figure 3), the left nephrostomy was removed 24 hours later.

Two months later, the patient underwent right percutaneous nephrolithotomy (PCNL), then 2 times extracorporeal shockwave lithotripsy (ESWL) and 2 weeks later we did completion PCNL in a sandwich technique manner after that right kidney was stone free.

One month later, the patient underwent right ureteral stent removal and left PCNL, and by that time, the patient was stone free. This was confirmed by a urinary tract CT scan.

The patient was discharged after 3 days of the second procedure. Left ureteral stent was removed 3 weeks later. The serum creatinine at the time of last ureteral stent removal was 2 mg/dL and all punctures had completely healed.

The patient was followed for the next 5 years, 3 to 6 monthly, with a stable baseline creatinine around 2mg/dL.

Discussion:

A study by Wang et al. conducted between February 2002 and December 2009 showed a prevalence of ARF of 0.72% in a series of 2,073 cases of ureteral stones and only five cases (33.3%, 5/16) were caused by bilateral ureteral stones. The study suggests that risk factors for

developing ARF in ureteral stone patients are bigger stones, ureteral stones in patients with only one functioning kidney or pre-existing kidney disease, and bilateral ureteral stones.[1] our patient had only left flank pain while he had bilateral renal stones with bilateral hydronephrosis which indicates that the right kidney was chronically obstructed and most probably not functioning well with minimal contribution to the overall renal function, so when the left one get acutely obstructed the other kidney couldn't compensate for the acute loss of the left kidney function and this could explain the severe rise in creatinine level.

The best imaging study to confirm the diagnosis of a urinary stone in a patient with acute flank pain is unenhanced, helical CT of the abdomen and pelvis. That can detect both stones and urinary tract obstruction, and has become the gold standard for the radiologic diagnosis of stone disease.[2]

Urgent intervention is indicated in a patient with an obstructed and infected upper urinary tract in order to prevent impending renal deterioration. Relief of upper tract obstruction may require either antegrade (percutaneous nephrostomy) or retrograde (retrograde ureteral catheterisation) approaches.

We preferred the former approach despite being more inconvenient to the patient because it is done under local anesthesia making it safer for the patient as his renal function is severely deranged and avoids the morbidity and risk associated with retrograde stent insertion under general anesthesia (GA) and will stay only for few days till his renal function starts to stabilize and his condition allows intervention under GA.

Close collaboration between nephrological, urological and radiological services is required and in many cases renal replacement therapy/dialysis may be necessary before relief of obstruction can be achieved. A significant diuresis should be suspected in cases of chronic bilateral high pressure urinary tract obstruction and that can complicate the patient condition through both physiological (excretion of retained solute and water) and pathological mechanisms (tubular concentrating dysfunction).[3]

On presentation, the renal functions showed marked derangements. However, since serum electrolytes, ECG and ABG values didn't meet the criteria for dialysis and the patient did not have any respiratory complaints, we did not initiate the patient on renal replacement therapy.

In a patient of obstructive uropathy, timely decompression may result in complete recovery of renal function. Decision to dialyze should not be undertaken on the basis of elevated serum creatinine alone; in this patient serum creatinine was 52.6 mg/dL at presentation and no dialysis was needed. Rather dialysis should be offered to patients presenting with refractory hyperkalaemia or metabolic acidosis, ECG changes, uremic complications (pericarditis, encephalopathy, bleeding) and diuretic resistant pulmonary edema.[4]

The dramatic recovery in renal function with the drop of creatinine to 7mg/dL at one week and as low as 4 mg/dL at 2 weeks could be attributed to early intervention by draining the kidneys using nephrostomies administered under local anesthesia which avoided the patient the risk of GA associated hypotension that could exacerbate the kidney injury and delay recovery. The patient overall general

wellbeing and the proper fluid management are other 2 factors which can contribute to early recovery of renal function.

On the right side we did PCNL twice and in between patient took 2 sessions ESWL to minimize stone burden and time for the second PCNL as large fragments were left after first PCNL and to avoid the morbidity of open surgery.

In the past, large incisions were used to extract urinary tract stones, but with the advent of endourology nowadays, stones anywhere in the urinary tract may get removed in a minimally invasive fashion.

Acknowledgement

This case presented to Jordan university hospital, The University of Jordan, Amman, Jordan 2008, and reported 2016.

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فشل كلوي حاد شديد ناتج عن الإنسداد بعد الكلوي
تقرير عن حالة

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الملخص

يحدث الانسداد الكلوي عند عدم مقدرة الكلى على تصريف البول، الأعراض تختلف بناءً على سرعة تكون الانسداد وإن كان لإحدى الكليتين أو كليهما معا. تعد الحصى البولية واحدة من أهم أسباب الانسداد البولي. هنا نقوم بعرض حالة انسداد بولي لكلا الكليتين ناتج عن الحصى البولي مع ارتفاع شديد في علامات فشل الكلى وكيف تم التعامل مع الحالة بشكل طارئ ثم كيف تم التعامل مع الحصى لاحقا. وتم عرض النتائج مفصلة في هذا البحث.

الكلمات الدالة: الحصى، ارتفاع وظائف الكلى، الانسداد الكلوي.