Obstructive Uropathy in Solitary Functioning Kidney

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Abstract

Obstructive uropathy is divided into upper and lower tract obstruction. Acute obstruction is not difficult to diagnose as it is commonly encountered in medical practice while chronic obstruction needs investigations to rule out the cause of obstruction and make a definitive diagnosis. The present report describes the case of a 53-year-old female patient with solitary functioning left kidney admitted to the emergency room with dysuria, periorbital swelling and abdominal distension. Laboratory investigations and computed tomography findings revealed deranged renal functions, raised blood sugar levels with obstruction in distal ureter secondary to ureteric stone. Double-J stenting was performed successfully to relieve obstruction.

Keywords: Obstructive Uropathy; Solitary Functioning Kidney

Introduction

Obstructive uropathy is defined as structural or functional hindrance of normal urine flow leading to obstructive nephropathy (renal dysfunction). Common causes of obstructive uropathy include anatomic abnormalities like posterior urethral valves, stricture and stenosis at the ureterovesical or ureteropelvic junction in children, calculi in young adults, bladder outlet obstruction (BOO) and carcinoma prostate in old age.

Pathologic findings consist of dilation of the collecting ducts and distal tubules and chronic tubular atrophy with little glomerular damage. Dilation takes 3 days from the onset of obstructive uropathy to develop; before then, the collecting system is relatively noncompliant and less likely to dilate. Obstructive uropathy without dilation can also occur when fibrosis or a retroperitoneal tumor encases the collecting systems, when obstructive uropathy is mild and renal function is not impaired, and in the presence of an intrarenal pelvis [1].

Obstructive renal stone in a solitary functioning kidney is a rare phenomenon. Unilateral obstructive uropathy is most commonly due to ureteral stones. In the US, the prevalence of ureteric stones is estimated to be 10% to 15%. There is increased prevalence in white populations compared with Hispanic, Asian, and African American populations, in that order. The highest incidence is seen in adults aged 30 to 50 years [2].

We present a case report of a patient with obstructive uropathy in solitary functioning kidney secondary to obstructed ureteric stone resulting in anuria who was successfully managed.

Case Report

A 53-year-old woman with solitary functioning left kidney, known diabetic and hypertensive presented to the urology emergency clinic with complaints of dysuria, peri-orbital swelling and abdominal distension for the previous 3 days. The patient appeared alert and oriented, but dehydrated and anuric. Past history of the patient reveal right nephrectomy for non-functioning kidney twenty years back.
secondary to stones. She is on oral hypoglycemic drugs for diabetes mellitus and angiotensin 2 receptor antagonist for hypertension.

Laboratory investigations revealed hemoglobin; 12.3 g/dL, total leucocyte count (TLC); 7.3*10^9/L, neutrophils 74%, random blood glucose: 15.7 mmol/L, serum urea: 24.3 mmol/L, creatinine: 870 mmol/L, serum Na: 141 mmol/L, and K: 5.4 mmol/L. Her CT KUB plain showed three calculi in the distal part of ureter with the largest measuring 1.3 cm with CT density 459 HU causing upstream hydronephroureter. Few calculi in the upper pole of kidney largest measuring 1.2 mm in caliber (Figure 1).

![Figure 1: CT KUB showing stone in the renal and distal ureter.](image1)

The patient was catheterized and hydrated with crystalloids, intravenous meropenem 500mg LV thrice daily was administered, electrolyte imbalance correction with continuous ECG monitoring, initiation of insulin injections and anti-hypertensive medications. She responded to conservative measures.

It was decided to contemplate Double-J stent to relieve obstruction. Ureterorenoscopy was performed under spinal anesthesia and Double-J stent was placed under vision via guidewire (Figure 2).

![Figure 2: Double-J stenting to relieve obstructive uropathy.](image2)
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Post-operatively patient’s symptoms of abdominal distension and periorbital swelling has settled. She had good urine output of 1700 ml and 1900 ml per 24 hours with serum creatinine of 640 mmol/l and 530 mmol/l on 1st and second post-operative day consecutively.

Patient was discharged with baseline of serum creatinine of 177 mmol/l with follow-up in Urology Outpatient department. Ureterorenoscopy for right ureteric stone and removal of Double-J-stenting was planned after 6 weeks.

Discussion

Obstructive uropathy in a solitary functioning kidney is a serious condition which needs to be managed aggressively. Failure to identify in time and management will result in the loss of kidney functions. Patient might need dialysis due to loss of renal functions and nephrectomy resulting in anephric patient with daily dialysis. The effects of urinary tract obstruction on renal function must be considered both during and after relief of obstruction.

Conclusion

Hydronephrosis refers to dilatation of the urinary collecting system of the kidney, is a symptom of obstructive uropathy. It is one of the greatest identifiable cause of renal insufficiency and renal failure. Obstructive uropathy, if not managed early can lead to devastating effect on the kidney resulting in loss of renal function thus increasing morbidity and mortality.

Bibliography


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