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Case Report
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OBSTRUCTIVE PYELONEPHRITIS IN A DIABETIC … THINK SLOUGHED PAPILLA!

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ABSTRACT

This case describes a patient presenting with acute kidney injury, loin pain, pyrexia, and unilateral hydronephrosis secondary to obstructing sloughed papilla. It demonstrates the importance of considering alternative causes of radiolucent obstructive uropathy in patients with poorly controlled diabetes mellitus especially where there are risk factors for renal papillary necrosis.

CASE

A 63-year-old woman presented to the emergency department with worsening of colicky left flank pain with intermittent radiation to the left side of her abdomen and refractory pyrexia. Her background history consisted of recurrent urinary tract infections with deranged renal function, type 2 diabetes mellitus, peripheral vascular disease, and persistent iron deficiency anemia.

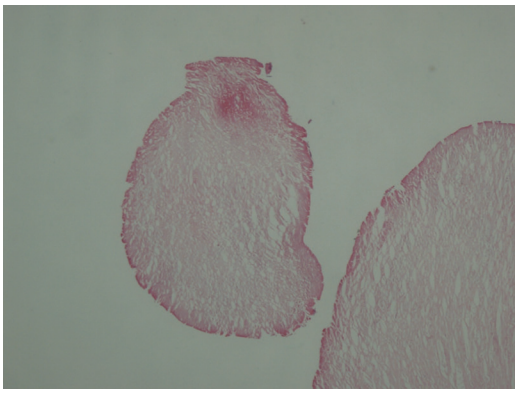
On admission she was pyrexial, nauseated and had left sided abdominal tenderness. She had a raised white cell count (16.2×10^9/L), creatinine (149 umol/L, baseline 86 umol/L), and C-reactive protein (CRP) (79.4 mg/L). She was admitted under the care of the renal medicine team due to acute deterioration of her renal function; IV fluids and ciprofloxacin were started for presumed pyelonephritis. A renal ultrasound scan was requested on day two due to continued decline in renal function. This demonstrated a moderately hydronephrotic left kidney with increased renal reflectivity in keeping with pyelonephritis. Urine and blood cultures were negative.

A non-contrast computed tomography (CT) scan was performed and she was found to have a dilated tortuous left ureter down to the vesicoureteric junction where no radiopaque calculi were identified. The lower left ureter was thickened near the vesicouretric junction (VUJ) with periureteric fat stranding, highly suggestive of a neoplastic lesion with secondary pyelonephritic change in the swollen left kidney. At this point she was referred to urology for investigation of likely obstruction due to upper tract urothelial carcinoma (UTUC). She underwent urgent JJ stent insertion which relieved the obstruction and improved her renal function.

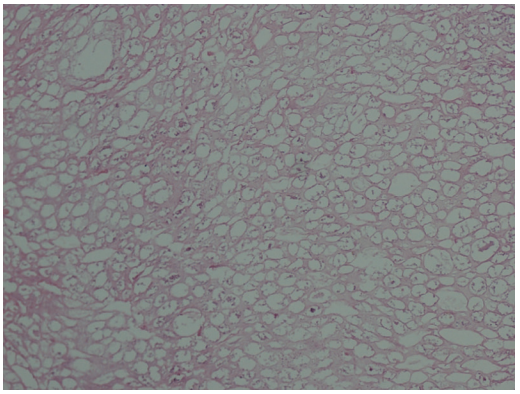
CT urogram post-stent insertion confirmed resolution of hydronephrosis and hydroureter, with persisting suspicion of intraluminal malignancy. Semi-elective flexible ureteroscopy was performed revealing a floating necrotic mass in the ureteric lumen and multiple necrotic papillae within the kidney. This soft tissue was identified in the lower ureter and extracted with basket. Microscopy confirmed that the tissue obstructing the left ureter was sloughed renal papillae and was reported by pathology as below (Figure 1).

HbA1C was 79 during this admission so changes were made to her diabetes medications and contact was made with her endocrinology consultant in order to optimize future diabetic control.

FIG. 1 Necrotic renal papilla. A 10 × 5 × 5 mm section of light brown tissue. Necrotic tissue containing ghost outlines of tubules, in keeping with necrotic renal papillae/sloughed papillae. A: ×20 magnification. B: ×100 magnification.



A



B

DISCUSSION

The above report describes an unusual cause of renal colic. For a patient with renal colic and pyelonephritis causing unilateral hydronephrosis, the differential diagnosis would include urolithiasis and local neoplasia. The most likely and most concerning explanation for a non-radiopaque obstruction would be transitional cell carcinoma. Ureteroscopic and histological findings in this case demonstrated otherwise and therefore highlight the importance of considering alternative diagnoses such as sloughed papillae in patients with risk factors for this. There is now a trend towards surgeons not performing diagnostic ureteroscopy and biopsy concerning for UTUC. This stems from recent reports of evidence of worse outcome and increased bladder recurrence after uretroscopy and biopsy (prenephroureterectomy).[1] However, consideration must always be given to the potential to find benign causes which may have similar radiological features on CT such as presented in this case (Figures 2–5).

Renal papillary necrosis (RPN) refers to coagulative cell death in the renal medullary pyramids and papillae and is understood to occur as an end result of localized ischemia, which can lead to localized infection and ultimately sloughing of necrotic papillae into the renal tract. There are multiple possible causes, including pyelonephritis, analgesic abuse, urinary tract obstruction and diabetes mellitus. It is recognized that the pathological process is often multifactorial as may also be the case here in which recurrent urinary tract infections and ultimately pyelonephritis could have been either causative or a consequence of localized necrosis.[2] This patient's recurrent infections and papillary necrosis are both recognized sequelae of diabetes and the decline in renal function prior to this emergency presentation would suggest the process had been ongoing for several months preceding obstruction. It should be noted that a referral to endocrinology for such a patient is recommended in order that their glucose control can be more tightly regulated and potentially prevent this happening in the future.

Historically there have been reports of recognized complications of sloughed papillae, with widely variable outcomes.[3] One more recent case report describes a similar presentation of a woman with diabetes being investigated for a bladder mass which had formed as a consequence of sloughed renal papillae.[4] Further data collection on the incidence and presentation of this complication in diabetes specifically could be beneficial to future potential interventions either in preventative or treatment measures, with prevention of recurrence also being an important consideration for future work. There does not at present appear to be conclusive literature on predictive factors such as HbA1c for developing RPN in diabetes though some have examined the imaging techniques which may best detect cases such as this. Various stages of

FIGS. 2–4 Central calyceal cavities (excavation from sloughed papilla).

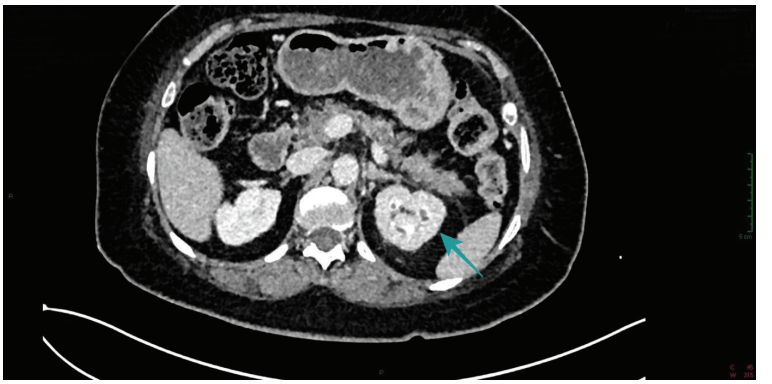


Fig. 2

Fig. 3

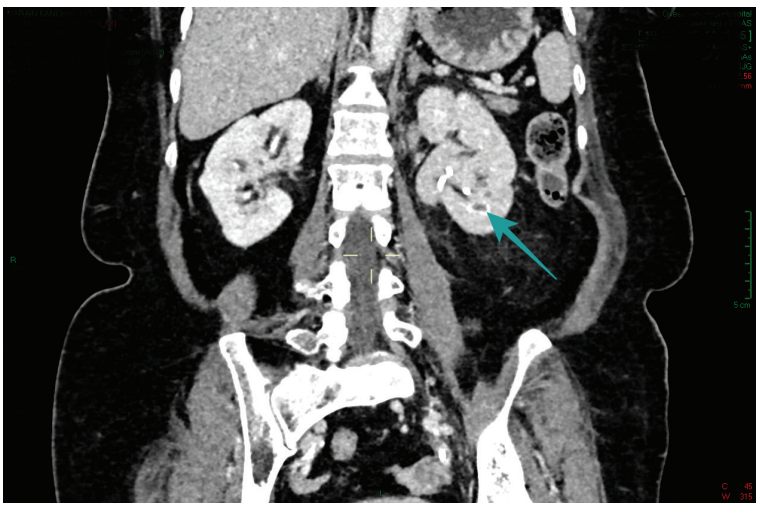
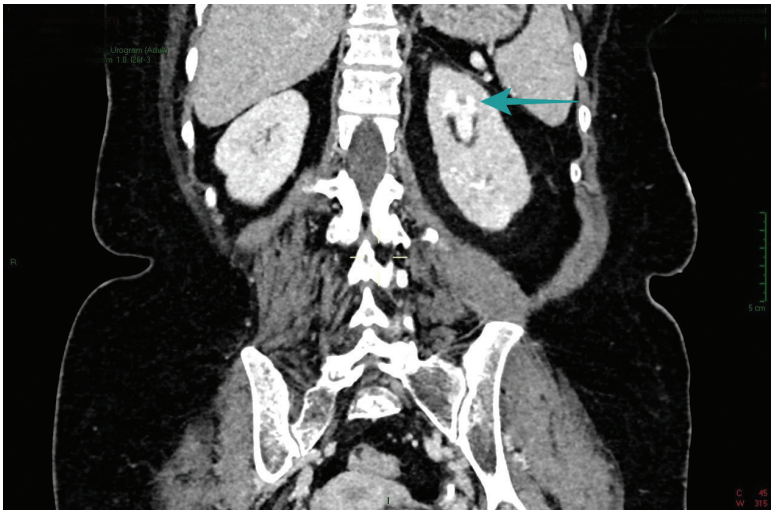


Fig. 4

FIG. 5 Forniceal/papillary excavation – lobster claw.



RPN could be seen on a urographic examination. In advanced cases of RPN, like the one we describe, contrast material filling the cavity left behind by the sloughed papilla leads to some suggestive features (lobster claw, egg in cup, clefts, triangular cavities, ring like shadows etc) (Figure 5).[5–7] With this report we aim to contribute to recognition of this as a differential diagnosis for obstructive uropathy in those at risk of having RPN.

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