

Ipsilateral Staghorn Calculus with Contralateral Tumour of the Renal Pelvis in a 55-Year Old Man

¹Babawale Taslim Bello, ²Yemi Raheem Raji, ³Adekunle Adeyomoye, ²Adeniyi Abdulwasiu Busari, ²Temi-Ete Irene Ediale and ²Bala Waziri

¹Department of Medicine, College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria.

²Department of Medicine, Lagos University Teaching Hospital, Idi-Araba, Lagos, Nigeria.

³Department of Radiation Biology, Radiodiagnosis, Radiotherapy and Radiography, College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria.

ABSTRACT

Introduction: Cancers of the renal pelvis have been linked with kidney and ureteral stones in several case reports. In the majority of these cases, the cancer occurred on the same side as the renal pelvis or ureteral stones. We report here, an unusual occurrence of a staghorn calculus in the right kidney and contralateral tumour of the left renal pelvis.

Case Report: A 55year old known hypertensive man was referred to our out-patient clinic on account of a year's history of recurrent right flank pain and a 6 month history of recurrent haematuria. Physical examination was unremarkable. Abdominal ultrasound scan findings were suggestive of bilateral renal stones. An abdominal CT scan revealed a staghorn calculus in the right renal pelvis and a discrete mass in the left kidney.

Discussion: The association between kidney and ureteral stones and cancers of the renal pelvis and ureter is thought to be due to chronic irritation as well as recurrent urinary tract infection caused by the presence of the stones within the urinary tract. Chronic irritation and infection may not completely explain the development of the tumour in the index patient since the tumour was located in the

contralateral kidney from that in which the staghorn calculus was located.

Conclusion: This case report highlights the need to consider the possibility of a renal pelvis tumour being present in the contralateral kidney when evaluating patients presenting with kidney stones particularly staghorn calculi.

Keywords: *Flank pain, haematuria, renal pelvis tumour, staghorn calculus.*

CASE PRESENTATION

A 55year old Nigerian man who had been hypertensive for 15years but poorly compliant with his antihypertensive medications was referred to our out-patient nephrology clinic on account of a one year history of recurrent right sided flank pain and a six month history of recurrent total haematuria. Pain was dull aching and intermittent with no episodes of colic or history of passage of stones in the urine. He had no fever, dysuria, increased urine frequency or urgency. He had been on α -methyldopa and hydrochlorthiazide/amiloride for about 15years for control of his blood pressure, but he took them only when he felt unwell or had his blood pressure checked

Corresponding author: Babawale Taslim Bello, Department of Medicine, College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria *Tel.:* +234 8023120993 *E-mail:* taslimbello@yahoo.com *Fax:* +234 16820102

and was told it was elevated. He had a significant history of alcohol intake and cigarette smoking, consuming an average of 27 units per week of beer for at least 20 years and 8 packs of cigarette per week

Examination revealed an obese man with a BMI of 32.1Kg/m², he was not pale, and had no palpable peripheral lymph nodes. His pulse rate was 94 beats per minute, his blood pressure was 170/110mmHg

Table 1. Results of laboratory investigation done by the patient at presentation

S/N	Laboratory Investigation	Result
1.	Urinalysis	
	Blood	3+
	Protein	+
	Nitrite	Nil
	Leucocyte Esterase	+
2.	Urine Culture	No bacterial growth
3.	Hb Concentration	1.5g/dL
4.	ESR	14mm/Hr
5.	Serum Creatinine	176µmol/L
6.	Serum Urea	11.3mmol/L
7.	Serum Sodium	139mmol/L
8.	Serum Potassium	4.4mmol/L
9.	Serum Bicarbonate	20mmol/L
10.	Serum Uric Acid	431.6µmol/L
11.	Fasting blood sugar	5.5mmol/L
12.	Total Cholesterol	6.8mmol/L
13.	LDL Cholesterol	4.9mmol/L
14.	HDL Cholesterol	1.2mmol/L
15.	Triglycerides	1.2mmol/L
16.	eGFR (MDRD)	45ml/min/1.73m ²

Hb = Haemoglobin, ESR = Erythrocyte Sedimentation rate, eGFR = Estimated Glomerular Filtration Rate, MDRD = Modification of Diet in Renal Disease.

over the same period. He worked as a bus driver and estimated his monthly income to be about thirty thousand naira (approximately \$200).

and a fourth heart sound was present on auscultation. Abdominal organs were not palpably enlarged. The rest of the physical examination was essentially

normal. Table 1 shows results of the laboratory investigations ordered at his initial clinic visit.

measuring 6.8cm x 4.3cm in the medulla of the left kidney extending into the pelvi-calyceal system and causing moderate hydronephrosis. The radiologic

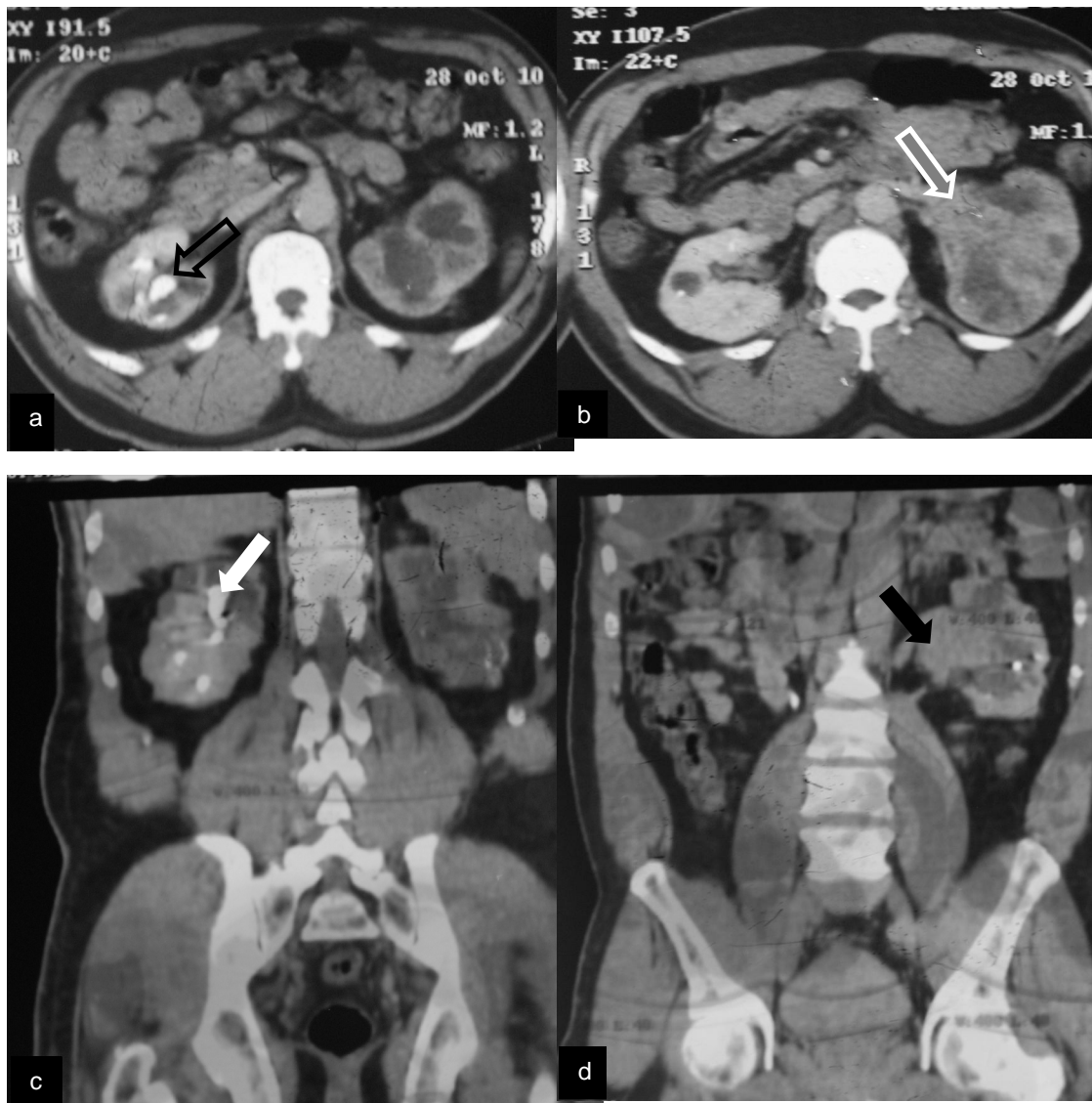


Fig. 1: Axial contrast enhanced CT of the abdomen (a) showing a staghorn calculus (black open arrow) with grade 1 hydrocalicosis of the right kidney and a grade 3 hydrocalicosis of the left kidney. Cut at a lower level (b) shows a mass in the renal pelvis (White open arrow) on the left which is the cause of the hydrocalicosis. Coronal reformatted images showing the staghorn calculus (white arrow) (c) and mass (black arrow) in the left renal renal pelvis with resultant hydrocalicosis (d)

Abdominopelvic ultrasonography showed normal sized kidneys with bilateral renal stones. An ill-defined mass was also noted within the left kidney. Computed tomographic urography revealed a well circumscribed, lobulated, heterogeneous mass

features of the mass were reported to be in keeping with a renal pelvis tumour. There was also a staghorn calculus within the calyces of the right kidney with associated mild hydronephrosis (Figure 1). A radionuclide scan was requested to determine the

contribution of each kidney to overall renal function; however this was not carried out because the patient lacked the funds to pay for the investigation.

He was commenced on oral Lisinopril 10mg daily and co-amilofide 1 tab. daily for the control of blood pressure and atorvastatin 10mg nocte for control of hyperlipidaemia. He was also counseled on the need for smoking cessation and moderation in alcohol intake, low salt diets and regular exercise. He was offered surgery (right pyelolithotomy and left nephrectomy) but declined because of non-availability of funds for surgery as well as concerns about the possibility of loss of renal function postoperatively. On one of his follow-up visits, he expressed a desire to seek help from a traditional medical practitioner and has since been lost to follow-up.

DISCUSSION

Cancers of the kidney and renal pelvis are the 9th most common malignant cancers and form the 12th most common cause of all cancer-related deaths in the United States [1]. Tumours of the upper urinary tract however constitute a small proportion of urothelial malignancies. Of all urothelial tumors, only 5-6% occur in the upper urinary tract (renal pelvis and ureter), and of these, the majority (80 – 90%) are transitional cell carcinomas while a small proportion (6–15%) are squamous cell carcinomas [2].

Cancers of the renal pelvis have long been linked with kidney and ureteral stones in several case reports. Kobayashi *et al* [3] described two cases of primary adenocarcinoma of the renal pelvis associated with calculi. One patient was a 64-year-old female who had multiple papillary tumors in the right ureter and renal pelvis. The other was a 57-year-old male who had diffuse infiltrating carcinoma in the left renal pelvis. Reed and Robinson [4] reported the finding of an invasive renal pelvic carcinoma at histology following resection of the left renal unit of a horseshoe kidney in a patient who presented with hydronephrosis and multiple calculi. Arisawa *et al* [5] described a 63-year-old man who presented right lower abdominal pain and passage of stones in the urine. He was found to have a pelvic kidney associated with staghorn calculus and extended pyelolithotomy was to be performed. However, during the surgery, a tumor was found in

the renal pelvis within which the staghorn calculus was located. Following examination of a frozen section which revealed a low grade transitional cell carcinoma, nephro-ureterectomy was performed. In the report by Kok *et al* [6], a 27-year-old man was found to have a low grade transitional cell tumour of the renal pelvis at pathological examination of his traumatically ruptured kidney. The kidney had been hydronephrotic due to urolithiasis of long duration. Medina *et al* [7] in their case report described a 75-year-old man who presented with hematuria, fever and flank pain.

Abdominal ultrasound scan and and CT revealed a calculus in the left renal pelvis and hydronephrosis following which nephrectomy was performed. Histology of the removed kidney revealed a carcinoma in the renal pelvis in addition to the underlying stone. Kayaselçuk *et al* [8] described two cases, one of carcinosarcoma and one squamous cell carcinoma of the renal pelvis both occurring in patients with untreated nephrolithiasis. In the patient with squamous cell carcinoma, a 56-year-old man, presented with left lumbar pain, hematuria, fever and weight loss nephrolithiasis of the left kidney that had been diagnosed 20 years earlier. The second patient, an 87-year-old woman, also had a long history of left kidney nephrolithiasis and presented with left lumbar pain and hematuria.

In virtually all the cases that have been reported in the literature, the tumour was discovered accidentally either during surgery to remove a stone or at histology following nephrectomy for a non-functional kidney associated with a calculus. Also, the tumours almost always occurred on the same side as the renal pelvis or ureteral stones. In the case reported here, there was an unusual occurrence of a staghorn calculus in the right kidney and contralateral tumour of the left renal pelvis. A review of the literature revealed that reports of this pattern of presentation are indeed rare. As was the case in the majority of patients reported in the literature, our patient presented with loin pains and haematuria. The loin pain had been present for at least a year before he presented to us, in keeping with a long history of untreated stone disease that was documented in several of the cases reported in the literature. Also, as was the case with other patients reported in the literature, the patient had radiologic evidence of obstruction of the urinary tract. However, this patient's clinical presentation is unique in the fact that

the renal pelvis tumour was located on the side opposite to that in which the staghorn calculus was located as against the findings in the majority of the patients previously reported in which the tumours were located on the same side as the calculi.

The association between kidney and ureteral stones and cancers of the renal pelvis and ureter is thought to be due to chronic irritation as well as recurrent urinary tract infection caused by the presence of the stones within the urinary tract [9 – 11]. Chow *et al* [12] showed that a history of kidney or ureteral stone was associated with a two and a half fold increased risk of developing a cancer of the renal pelvis or ureter during a 25 year follow up period. This risk of was, more than two fold higher in women as they were in men, higher with kidney stones than with ureteric stones, and higher in patients whose stones were associated with a urinary tract infection than in those whose stones were not associated with infection. The majority of the tumours (71.7%) were transitional cell type although about 17% of them were squamous cell carcinomas.

Chronic irritation and infection may not completely explain the development of the tumour in the index patient since the tumour occurred on the side opposite to that in which the staghorn calculus was located. However the patient had other identified risk factors for cancers of the renal pelvis particularly hypertension and cigarette smoking [13]. Despite this, the cancer may still be related to the kidney stones. In the study by Chow *et al* [12], of the 33 subjects with available information on the laterality of the stones and tumors, 20 (60.6%) patients had stones and tumors on the same side, whereas 8 (24.2%) patients had stones and tumors on opposite sides. Five patients (15.2%) had bilateral stones.

CONCLUSION

This case report highlights the need to also consider the possibility of a renal pelvis tumour being present in the contralateral kidney when evaluating patients presenting with kidney stones particularly staghorn calculi.

Conflict of Interest

The authors report no disclosure or conflicts of interest.

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