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Review Article

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INCIDENTALLY DETECTED TRANSITIONAL CELL CARCINOMA IN A NONFUNCTIONING KIDNEY: SHOULD WE RELY ON RADIOLOGY?

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Abstract: Primary transitional cell carcinoma (TCC) of the renal pelvis is a relatively rare disease and incidentally detected in a non-functioning kidney is much rarer. Herein, we report a case of incidentally detected histopathologically proven case of primary TCC of renal pelvis in a nonfunctioning kidney associated with staghorn calculus.

Introduction

Primary transitional cell carcinoma (TCC) of the renal pelvis is a relatively rare disease accounting for less than 1% of the genitourinary neoplasms.1 Incidentally detected TCC of renal pelvis in a nonfunctioning kidney associated with staghorn calculi have rarely been reported.2 Herein, we report a case of incidentally detected histopathologically proven case of primary TCC of renal pelvis in a nonfunctioning kidney associated with staghorn calculus.

Case Study

This 45-years-old, male patient presented with pain in the left flank for last 2 months, with no history of other significant complaint except low grade recurrent fever and malaise. Examination revealed a visible lump in the left loin region, which was ballotable. Complete hemogram, serum biochemistry and renal function tests were within normal limits. Ultrasound examination found left nephrolithiasis (a staghorn calculus) and gross hydronephrosis. Intravenous pyelogram revealed non-excretion of contrast media with staghorn calculus in left kidney (Figure 1).

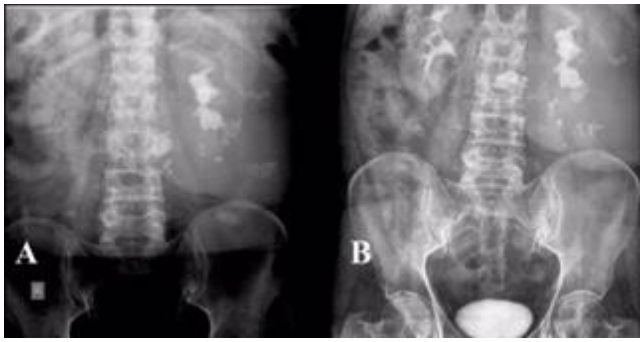

Figure 1: Intravenous pyelogram of the patient showing non-excretion of contrast media with staghorn calculus in left kidney.

Contrast enhanced computerized tomography (CT) of urogram, in addition revealed left pyonephrosis and non-excretion of contrast media (Figure 2).

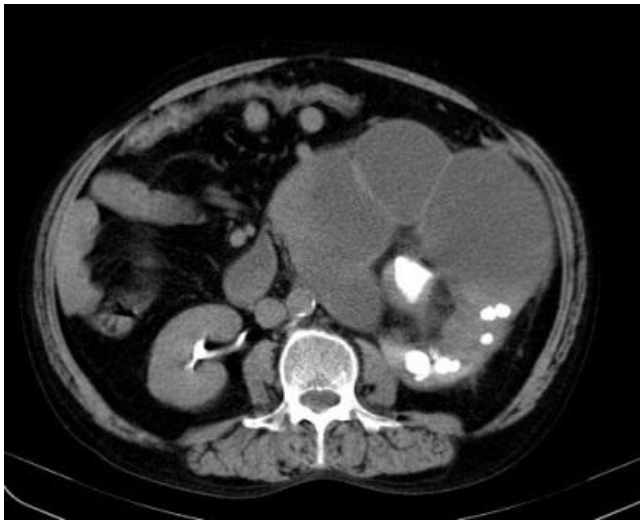

Figure 2: Computerised Tomogram showing left hydronephrotic kidney with non-excretion of contrast medium.

The glomerular function rate as detected by the diuretic DTPA renal scan was 6 milliliters per minute, with 5% on left side and 95% on right side. Left nephrectomy was undertaken in view of pyonephrosis.

Postoperative gross pathological examination showed that the kidney was markedly enlarged with marked dilatation of the pelvi-calyceal system and thin residual renal parenchyma (Figure 3).

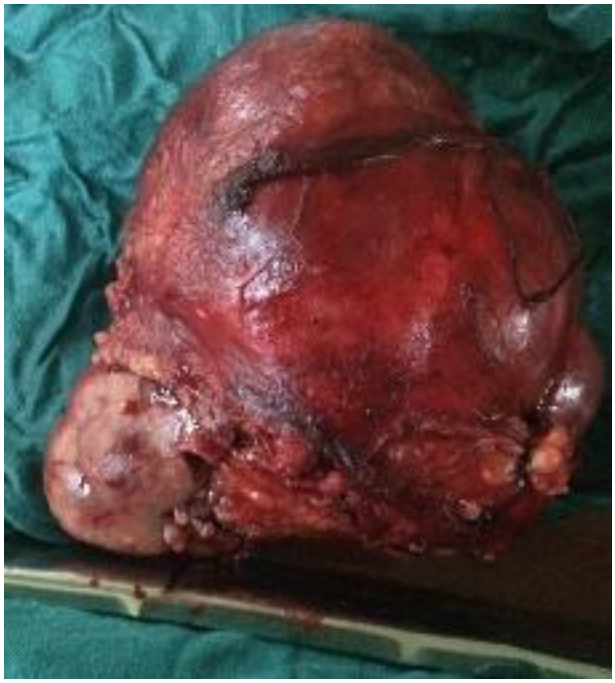

Figure 3: Kidney specimen (gross) showing marked dilatation of the pelvi-calyceal system and thinning of residual renal parenchyma.

A staghorn stone and multiple small calculi were identified in the dilated calyces. On cut section 3 centimeter frond like growth was present in the renal pelvis. Histopathology of the specimen showed transitional cell carcinoma. The metastatic work-up was negative, and hence he was finally diagnosed to have TCC, stage I (pT1N0M0). The patient had uneventful course in the hospital and was discharged.

Discussion

There is petite reporting in the indexed English literature of the association of transitional cell carcinoma (TCC) and staghorn calculus in a nonfunctioning kidney.[2] Most of the stone associated malignancies of renal pelvis are squamous cell carcinoma (SCC). Chronic irritation with superimposed infection is believed to induce squamous metaplasia and subsequent neoplasia in the urothelium, resulting in squamous cell carcinoma. The etiology of primary TCC of the renal pelvis is associated with chronic smoking, chronic use of laxatives,

non-steroidal anti-inflammatory drugs (NSAIDs) such as phenacetin, and occupational hazards to organic chemicals.

Majority patients of the TCC of renal pelvis are symptomatic presenting as hematuria (75-90%), with or without renal colic. Flank pain occurs in 20-40% of patients, secondary to an obstructive tumor mass. Physical examination is generally normal, with the exception of a palpable flank mass seen in less than 10% of patients.[3]

Literature pertaining to radiological identification of renal pelvic tumors is not very promising. A radiological review of radiological findings in renal pelvic tumors showed that conventional radiological findings of filling defects, obstructive lesions or nonfunctioning kidney by intravenous urography are all non-specific. Because of this, a renal tumor usually remains unsuspected in a symptomatic patient of nonfunctioning kidney.[4]

Advanced radiological evaluation such as computerized tomography or magnetic resonance imaging (MRI) is not done routinely in every case, especially in developing countries where the cost of the tests is an issue. Even CT or MRI does not help in exact diagnosis, but with its multi-planar capability can provide useful information about the detection, characterization, and anatomical extent of the tumor.[5] Lee et al found that the most significant features in CT of patients with TCC were presence of enhancing exophytic mass; extraluminal or intraluminal.[6]

On computed tomography and MRI, early stage (I or II) TCC of the kidney is seen as a central solid mass confined to the renal pelvis and appears separated from the renal parenchyma by either renal sinus fat or excreted contrast material. Advanced stage III or IV TCC obliterates the renal sinus fat and infiltrates into the surrounding parenchyma, typically preserving the reniform contour. Transitional cell carcinoma of the renal collecting system can also present as renal or perinephric abscesses.[7]

Though, presentation of TCC as hydronephrosis is a rare finding, a small tumor can produce considerable hydronephrosis as the only visible finding. The hydronephrotic form of TCC may be due to uretero-pelvic junction (UPJ/PUJ) obstruction and may present a diagnostic dilemma. Moreover CT scan may miss small urinary filling defects (<5 mm) between the 'cuts'.[8]

Due to cost restrains, it is impractical to perform MRI or 64 slice CT for every patient of hydronephrotic non-functioning kidney with renal stone. Thereby, it is prudent for the pathologist to carefully look for malignancy. Filling defects, delay in appearance in pyelogram or renal parenchymal thinning should raise a suspicion of renal pelvic tumors despite the absence of mass effects and preservation of renal contour, warranting further studies by MRI or biopsy from renal pelvis preoperatively.

The high incidence of renal pelvic malignancies in a hydronephrotic kidney highlights the need for meticulous sampling of the renal pelvis by the pathologist in such specimens.

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