Case Report

Unusual radiological presentation of renal cell carcinoma

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ABSTRACT

We present an unusual case of renal cell carcinoma in a 59-year-old Saudi male less than 3 cm in size showing a pelvicalyceal filling defect on excretory urography and retrograde pyelography. Renal stones and blood clots were excluded by ultrasound and computerized tomography scanning. A urothelial tumor was initially diagnosed; finally surgery revealed a papillary renal cell carcinoma.

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Pelvicalyceal filling defect could be from stone blood clot or tumor (transitional cell carcinoma).[1,2] It is unusual for renal cell carcinoma to present as such. Excretory urography and retrograde pyelography are essential for primary diagnosis[3,4] moreover, ultrasound (US) and computerized tomography (CT) scanning can help in the differential diagnosis and to confirm and stage renal tumors.[5,6]

Case Report. A 59-year-old man presented with recurrent frank hematuria every 2-3 months for the past 11 months. He had mild dysuria but no renal pain. There was a history of renal stones and a right pyelolithotomy and pyeloplasty. Physical examination was normal. Urine tests revealed blood, red blood cells and white blood cells, but no bacteria or growth. The hemoglobin level and serum urea and creatinine were within normal limits. Intravenous urography with nephrotomography showed a small filling defect expanding a left lower pole calyx **(Figure 1).** This was subsequently confirmed by ureteroscopy and retrograde pyelography **(Figure 2)**. Ultrasound revealed an irregular hypoechoic lower renal sinus but no stone shadow **(Figure 3)**. Computed tomography scan showed a suspicious enhancing low density lesion in a lower calyx but was negative for extrarenal or distal spread **(Figure 4).** A provisional diagnosis of a urothelial tumor was made although cytological examination of the catheterized urine and ureteric brushings were inconclusive. Left nephrectomy revealed a yellow papillary tumor involving a meduallary pyramid and lower poles calyx. The lesion measured approximately 2.8 x 1.5 x 1 cms. The histological picture was that of a well differentiated papillary renal cell carcinoma **(Figure 5)**.

Discussion. Renal cell carcinoma seldom presents as a pelvicalyceal filling defect on excretory urography or retrograde pyelography but may on occasion invade a renal calyx in such fashion as to be mistaken for a primary urothelial lesion and many subsequently become difficult to distinguish from a non-opaque calculus, blood clot or other filling defect.[1,2] Retrograde pyelography can provide fine mucosal details, which may help further to establish the diagnosis; for example (stipple sign specific for transitional cell carcinoma). The procedure can also be combined with brush

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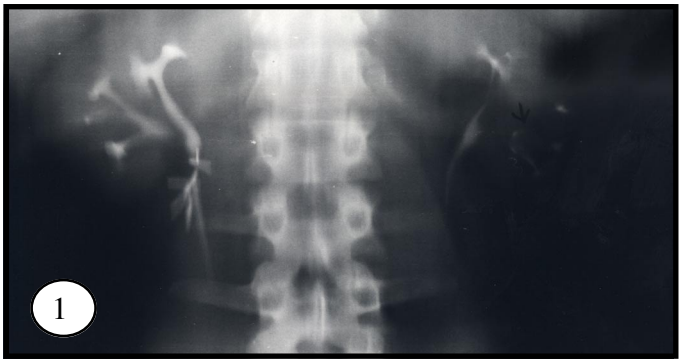


Figure 1 - Tomogram (renal area) at 10 minutes from IVU showing a filling defect expanding a left lower pole calyx. Note evidence of sutures at right PUJ from previous pyelolithotomy. IVU - intravenous urography, PUJ - pelviureteric junction

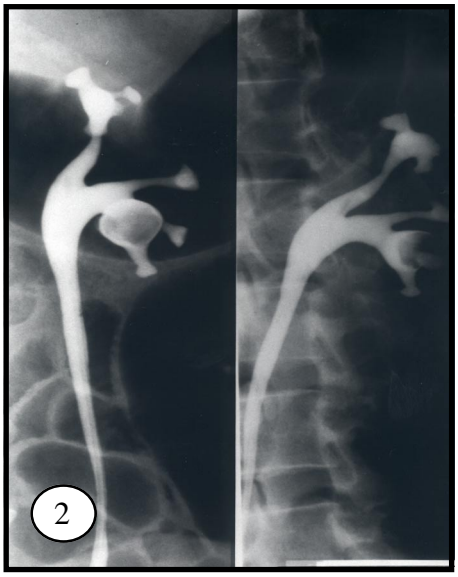


Figure 2 - Left retrograde pyelogram confirms the presence of well circumscribed filling defect expanding a major lower pole calyx.

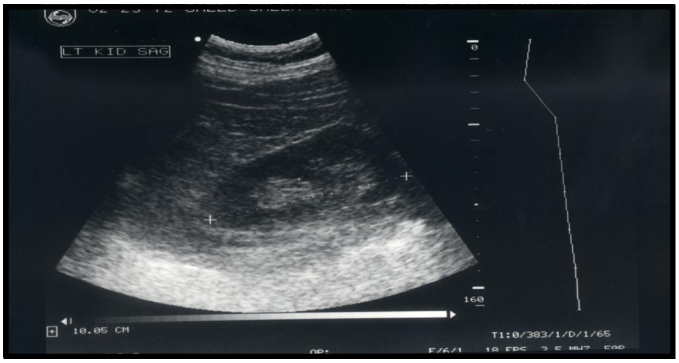


Figure 3 - Ultrasound left kidney (sagittal section) showing an enlarged hypoechoic lower renal sinus.

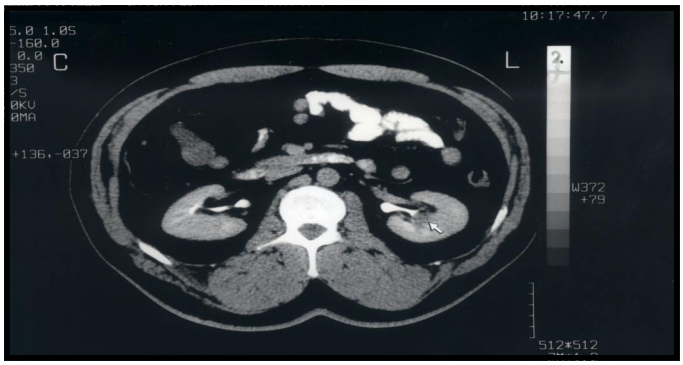
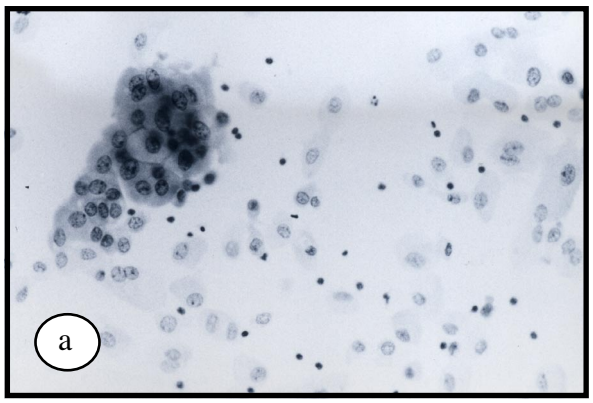


Figure 4 - Computerized tomography showed a small ill-defined low density lesion splaying a lower pole calyx.



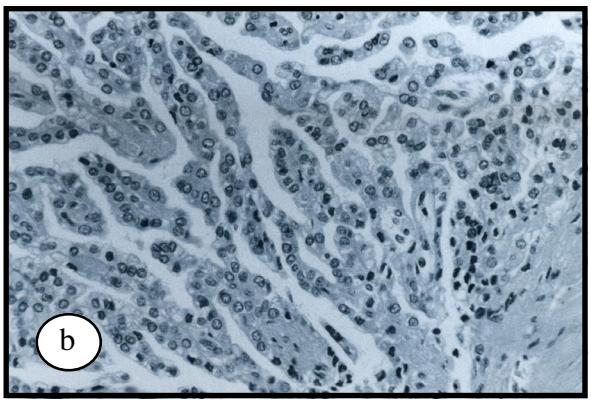


Figure 5 - Catheterized urine cytology **a)** a relatively cellular sample is present with loosely cohesive clusters of relatively bland looking epithelial cells. There is subtle cytoplasmic vacuolation within some of these cells (which in the correct clinical context could raise the possibility of a renal cell carcinoma). Definitive diagnosis on the cytology is, however extremely difficult, and differentiation of these cells from a transitional cell papilloma or reactive urothelium is also problematic (x400). **b)** the tissue sections revealed a pedunculated papillary renal cell carcinoma. Approximately 60% of the cells had eosinophilic cytoplasm, but the remaining 40% of cells showed cytoplasmic vacuolation with a clear cell component. The lesion must be regarded as a carcinoma because of these cytological features and because the size of the tumor was too large to be accepted as an adenoma (x200).

cytology, which proved useful in atypical poorly-differentiated lesions.[3,4] Ultrasonography and CT have been employed in the non-invasive evaluation of pelvicalyceal filling defects. Ultrasound can differentiate soft tissue tumors from renal calculi but not from blood clots[5,6] CT on the other hand can accurately differentiate renal calculi and assess the functional status of the kidneys. The density of a transitional cell carcinoma is usually sufficiently different from other causes of renal pelvic and calyceal filling defects to suggest an accurate diagnosis. It typically shows minimal enhancement after injection of contrast material and is mostly hypovascular on arteriograms compared to the hypervascular renal cell carcinoma.[7] Furthermore, CT can provide invaluable anatomic localization for determining the site of origin of a lesion and plays an important role in evaluating gross parenchymal invasion, adjacent organ involvement and metastasis.[8,9] Neither CT nor US were superior in the characterization of lesions 3 cm or less, and both cannot replace intravenous urography in the diagnosis of pelvicalyceal neoplasms but serve as an adjuvant in their evaluation.[1,10] Finally investigating mucosal pelvicalyceal lesions is still best carried out by retrograde pyelography which in addition to showing the lesion, can provide cytological and histological proof (in the more accessible lesions) prior to exploratory surgery.

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