

# A Rare Case Report: Renal Squamous Cell Carcinoma

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**Abstract:** Squamous cell carcinoma (SCC) is a rare malignancy of the upper urinary tract, often present secondary to history of chronic nephrolithiasis with resultant squamous dysplasia. We present a case of a 50-year-old man with a long-standing history of renal calculi. Investigations revealed heterogeneously enhancing renal parenchyma and staghorn calculi with resultant gross hydronephrosis and completely obstructive non-excreting right kidney. The radiological suspicion from the Computed Tomography was of SCC. The patient underwent right nephrectomy which showed a multifocal tumor with irregular cauliflower-like whitish growth arising from the cystic wall caused by nephrolithiasis. Most SCC of the renal pelvis present with advanced disease and dismal prognosis while our patient presented with disease localized to kidney and no distant metastasis. Thus nephrectomy can be curative if the disease is diagnosed earlier. This suggests high level of suspicion in patients with chronic history of renal stones can help improve lead time of diagnosis and thus prognosis of patient.

**Keywords:** Renal squamous cell carcinoma, chronic stones complications, rare renal cancers, renal pelvis mass, differentials of transitional cell carcinoma

## 1. Case Report

A 50-year-old male with a chronic history of renal stones presented with complaints of pain in the right flank region for 2 months. There was no history of fever, burning micturition, hematuria, trauma, tuberculosis, relevant occupational history. His total leukocyte count was 8200/cummand serum creatinine of 1.2 mg/dl.

Ultrasound abdomen on OPD based showed an enlarged right kidney, heterogeneously hypoechoic parenchyma with uninterrupted vascularity on doppler flow with hydronephrosis and cystic spaces, and shows staghorn calculi and few stones involving the renal pelvis, mid and lower calyces [Fig-1-A, B]. Multiple enlarged necrotic lymph nodes were noted involving para-caval, aortocaval, para-aortic, and right renal hilar region with the largest of size (23 x 31) mm causing Inferior vena cava compression and resultant slow and turbulent flow in Inferior vena cava [Fig 1-C] No invasion surrounding the structure is noted.

The patient underwent a CT Urography which confirmed the findings of the ultrasound. Enlarged right kidney with heterogeneously enhancing renal parenchyma and staghorn calculi with resultant gross hydronephrosis [Fig 2-A, B] and faint heterogenous excretion proximal to stone and absence of opacification of the collecting system distal to stone in 24-hour follow-up suggestive of completely obstructive non-excreting right kidney [Fig-2-C]. There was evidence of multiple variable-sized mixed-density conglomerated necrotic lymph nodes involving para-caval, aortocaval, para-aortic, right renal hilar region, and retroperitoneal space. [Fig 2-B]

Given the malignancy of the right kidney, the patient underwent a right nephrectomy, the procedure was uneventful. The postoperative period was unremarkable. On gross examination, the specimen was found to be greyish white, firm, enlarged right kidney measuring (6 x 10 x 4.5 cm). [Fig 3-A]. On the cut section, internal architecture is completely distorted with loss of cortex and medulla. Irregular whitish cauliflower-like growth of size (5 x 9 x 4 cm) arising from cystic wall arising from nephrolithiasis. Multiple cystic areas are seen with multiple brownstones. [Fig 3-B]

Microscopic evaluation revealed irregular infiltrating nests and sheets of tumor cells with destructive stromal invasion. Squamous differentiation in form of keratin pearls and individual cell keratinization are seen. Loss of renal echo texture with large areas of chronic inflammation is seen [Fig 3-C]. FNAC shows chronic inflammatory cells, tufton giant cells (red arrow) against the eosinophilic background [Fig 3-D]. Overall, suggestive of well-differentiated squamous cell carcinoma limited to the kidney with changes of chronic pyelonephritis.

## 2. Discussion

SCC is less prevalent than TCC in the upper urinary tract, but in contrast to TCC, it has a poor prognosis. It accounts for 1.5 % of malignancies of the upper urinary tract. In 40-80% of cases, it is associated with renal calculus disease [1]. Tumor rarity, lack of specific radiological features, and most of the symptoms of SCC like flank pain and hematuria mimic renal stones. So, in most cases, it remains undiagnosed preoperatively and diagnosed only on the basis of Histopathological examination of excised non-functioning kidney [2]

Renal calculi cause persistent irritation of the renal epithelium and with chronicity results in the transformation of the transitional epithelium into squamous epithelium, leukoplakia, and finally leads to dysplasia and malignancy [3]. Other risk factors for renal SCC are renal calculi, hydronephrosis, chemical use/abuse, vitamin A deficiency, and hormonal imbalances [4]. So frequent follow-up is recommended for patients with chronic pyelonephritis and nephrolithiasis.

Radiological findings on CT scan are in form of infiltrative solid soft tissue density ill-defined mass, hydronephrosis and calcifications, peri renal invasion, and non-functioning kidney with stones. Common features of SCC on CT scans are enhancing extra luminal and exophytic mass with sometimes intraluminal components [5]. Although a CT scan does not provide a precise diagnosis it helps to determine the exact anatomical extension [6]. MRI findings of SCC of the kidney are nonspecific and thus have no significant role in SCC.

Histopathological investigations are the gold standard for the diagnosis of SCC. A combined approach including clinical history, radiological imaging, and Histopathological investigations is often used for the diagnosis of renal SCC.

Grading of the tumor is done by the extent of tumor invasion, microscopic examination of the local lymph nodes, and a radiographic examination for distant metastases. Renal SCC usually presents in advanced stage pT3 or higher. Holmäng [7] estimated that the outcome for patients with SCC of the upper urinary tract was poor with less than 10% alive after 5 years. In patients without evidence of metastasis, the preferred treatment is radical nephroureterectomy with excision of the bladder cuff [7]. In unifocal tumors, parenchyma-sparing surgeries can be tried in selected patients. Due to the advanced stage and poor prognosis in the majority of patients, cisplatin-based adjuvant chemotherapy and radiotherapy are typically administered, although they have not been found to improve survival, emphasizing on the importance of early diagnosis [2].

### Teaching Points

- SCC of the renal pelvis presents with a dismal prognosis due to nonspecific symptoms and radiological features.
- High index of suspicion in patients with a history of long-standing stones improves the lead time interval for patients and therefore their prognosis.

### Differential Diagnosis

- Xanthogranulomatous pyelonephritis
- Infiltrative renal malignancies
- Urothelial cell carcinoma.
- Renal medullary carcinoma
- Atypical growth pattern of clear cell, papillary, or chromophobe carcinoma.

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