

## Squamous cell carcinoma of the kidney in a patient with staghorn calculi

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### ABSTRACT

Primary squamous cell carcinoma of the renal parenchyma is an extremely rare entity. The diagnosis of squamous cell carcinoma of the renal pelvis is usually unsuspected due to the rarity and inconclusive clinical and radiological features. The insidious onset of symptom and lack of any pathognomonic sign leads to delay in the diagnosis and subsequent treatment, resulting in grave prognosis for these patients. Here, we present a case of incidentally detected renal squamous cell carcinoma in a 71-year-old male with a staghorn calculus and Xanthogranulomatous pyelonephritis. The patient was treated with radical nephrectomy.

**Keywords:** Radical nephrectomy, Squamous cell carcinoma, Staghorn calculus.

Most renal tumors are either adenocarcinoma originating from the renal parenchyma or transitional cell carcinoma that is originated from the renal pelvis. Primary renal squamous cell carcinoma (RSCC) is rare cancer with a variable incidence of about 0.5–15% of all urothelial cancers [1-2]. Very few cases of primary SCC of the kidney have been reported in world literature [3]. The insidious onset of symptoms and lack of any pathognomonic sign leads to delay in diagnosis and treatment [4-5]. The predisposing factors leading to the development of RSCC are chronic irritation due to preexisting renal stones or prior surgery for renal stones, analgesic abuse, or radiotherapy [6]. This diagnosis should be included in one's differential when evaluating a renal mass that is associated with chronic inflammatory conditions [7].

The case being reported had SCC of the kidney presenting as staghorn calculi and Xanthogranulomatous pyelonephritis (XGP). The tumor was diagnosed only after resection of the specimen and its extensive sampling.

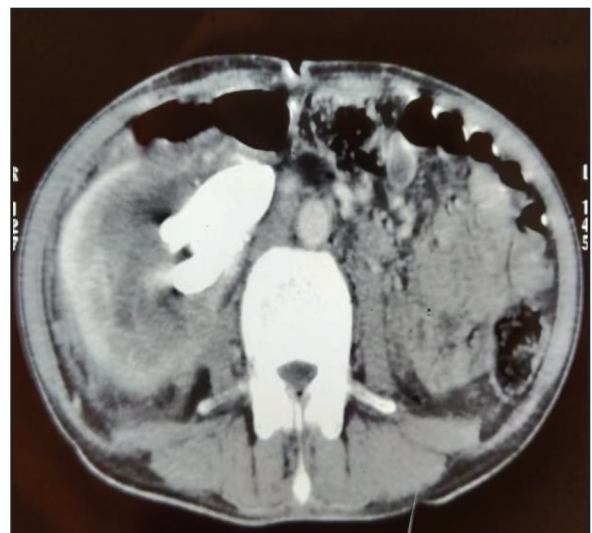
### CASE REPORT

A 71-years-old male with a long-standing history of renal calculi for the last four years presented with complaints of fixed, dull-aching left flank pain and intermittent fever with chills and rigor for six months. The patient was diagnosed as a case of XGP for which he was treated symptomatically. He was also a chronic smoker (30-pack-year history of smoking) and poorly controlled diabetic for the last forty years.

On examination, the vitals were stable. General examination revealed pallor and mild left costovertebral angle tenderness but otherwise normal. The patient had leukocytosis on presentation

(16000/mm<sup>3</sup>). The blood urea was 34mg/dl and creatinine was 0.8mg/dl. Urinary examination revealed sterile urine. Ultrasonography of kidney ureter bladder (KUB) revealed heterogeneous mass lesion within the pelvis of the right kidney measuring 8.7 x 8.4 cm with a large staghorn calculus in the pelvis measuring 4.9 cm and a few small calculi. Contrast-enhanced computed tomography KUB showed large staghorn calculus 5.6 X 4.3 cm with large heterogeneous mass with peripheral rim calcification giving a diagnosis of XGP/ chondromyxoid tumor of the right kidney (Fig. 1).

The patient underwent right radical nephrectomy. Gross examination of the specimen showed a right-sided nephrectomy specimen measuring (13x10x8) cm. A large irregular friable



**Figure 1:** CECT showing a enlarged staghorn calculus 5.6 x 4.3 cm in right ureteropelvic junction without any contrast excretion

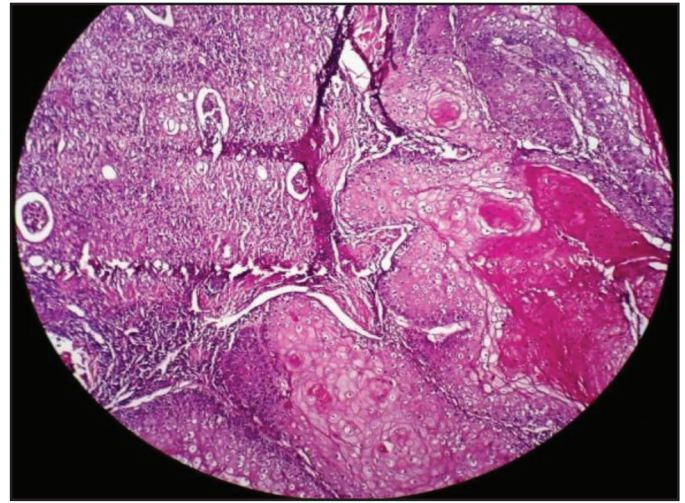


**Figure 2:** Specimen of the right simple nephrectomy shows right kidney measuring 13.5 x 10 x 8 cm. A large irregular friable growth is noted involving the pelvicalyceal system as well as the renal parenchyma measuring 7 cm with distorted anatomy. A calculus is noted at ureteropelvic junction

growth is noted involving the pelvicalyceal system as well as the renal parenchyma measuring approximately 7 cm. A hard calculus is noted at the ureteropelvic junction (Fig. 2). Several sections taken from the specimen showed histological features of a well-differentiated keratinizing SCC. The pelvis adjacent to the stone shows extensive squamous metaplasia with dysplastic changes (Fig. 3). Representative section from the resected distal end of the ureter, hilar vessels, adjacent adrenal and perirenal fascia and fat are unremarkable. Histopathological examination confirmed the diagnosis to be Squamous cell carcinoma of the right kidney. In our case, carcinoma was unsuspected clinically and radiologically and the diagnosis came to light only on histology. The patient had an uneventful postoperative course in the hospital and discharged. The metastatic workup was negative. Now, the patient is on regular follow-up since six months without any evidence of disease.

## DISCUSSION

In the upper urinary tract system, transitional cell carcinoma is the more common type of malignancy arising from the renal pelvis, whereas SCC is uncommon with a reported incidence of only 0.5-0.8% [8]. SCC in the kidney is very unusual and is known to arise from collecting system. Chronic irritation, inflammation, and infection induce squamous metaplasia of the renal collecting system, which may progress to dysplasia and carcinoma in some patients [9]. Whether the occurrence of squamous metaplasia is due to the presence of the calculus that leads ultimately to the development of carcinoma or existence of SCC causes the formation of calculus is not clear yet. Radiologically, primary SCC of the renal pelvis may appear as a solid mass, with hydronephrosis, calcifications, or as a renal pelvic infiltrative lesion without evidence of a distinct mass. The radiologic differential diagnosis includes primary and secondary renal neoplasms and XGP associated with renal calculi [10].



**Figure 3:** Histopathology shows features of a well-differentiated keratinising Squamous cell carcinoma. The pelvis adjacent to the stroma shows extensive squamous metaplasia with dysplastic changes. H & E (10 X 10)

XGP is an uncommon form of chronic pyelonephritis, typically occurring as a result of chronic obstruction, usually associated with stone which leads to hydronephrosis, causing destruction of the renal parenchyma. XGP is commonly associated with lithiasis, however, rarely causes keratinizing squamous metaplasia and its manifestations closely mimic renal neoplasm, leading to misdiagnosis of malignancy. It is aggressive with a high-grade at the time of presentation and has a poor prognosis when compared to the other upper urinary tract malignancies. Nephrectomy with or without ureterectomy is the treatment of choice in patients suffering from squamous cell carcinoma of the kidney. There is a lack of evidence of survival benefits of chemoradiation following surgery but is advocated by some with the hope that it might increase survival [10].

## CONCLUSION

Renal calculi of long duration pose a risk for the development of squamous metaplasia that may lead to squamous cell carcinoma. This diagnosis should be included in one's differential when evaluating a renal mass that is associated with chronic inflammatory conditions. Although this malignancy is rare in the upper urinary tracts, patients with long-standing nephrolithiasis should be monitored with proper imaging. These tumors should be treated with aggressive surgical resection, with chemoradiation in the metastatic setting.

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