## Case Report

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# A rare case of squamous cell carcinoma with xanthogranulomatous pyelonephritis in a patient with chronic obstructive renal calculi

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#### **ABSTRACT**

Squamous cell carcinoma (SCC) of the kidney is a rare entity. Often it is confused with Xanthogranulomatous Pyelonephritis (XGP), which is a chronic inflammatory disorder of the kidney, associated with the destruction of the renal parenchyma usually in the setting of an infectious process. A 76 year old male presented with right flank pain and vomiting. On examination, was found to have tenderness with localized guarding in the right flank. Investigations revealed a mass arising from the lower pole of the right kidney which was hydronephrotic and had features suggestive of stage III xanthogranulomatous pyelonephritis (XGP) with pyonephrosis and the presence of multiple calculi. Patient initially underwent a drainage of the pyonephrosis and subsequent nephrectomy. Histopathology revealed the presence of both XGP and SCC in the resected kidney specimen. Chronic nephrolithiasis is a predisposing factor for both XGP and SCC. XGP shares many characteristics with SCC in terms of both its radiographic appearance and its ability to involve the adjacent structures. Chronic nephrolithiasis is a predisposing factor for both XGP and SCC. XGP shares many characteristics with SCC in terms of both its radiographic appearance and its ability to involve the adjacent structures.

Keywords: Chronic obstructive calculi, Squamous cell carcinoma of kidney, Xanthogranulomatous pyelonephritis

#### INTRODUCTION

Squamous cell carcinoma (SCC) of the kidney is a rare entity.<sup>1</sup> Chronic irritation as is associated with long standing renal calculi is a known risk factor for SCC of the kidney. On account of similar radiological findings and clinical picture, it is often confused with Xanthogranulomatous pyelonephritis (XGP).

The exact treatment of SCC of the kidney remains unclear with surgery being considered one of the mainstays of treatment. Our study is a rare case report of both SCC and XGP, being present simultaneously in the same kidney.

#### **CASE REPORT**

A 76-year-old male presented with complaints of pain in the right flank of 10 days duration with associated complaints of vomiting and anorexia. On examination, the patient was found to have tenderness with localized guarding in the right hypochondrium and the right flank region.

On investigating the patient further:

He was found have to have a serum creatinine of 1.5 with a raised total leukocyte count of 17,200.

Urine routine and microscopy was found to be within normal limits and culture did not reveal growth of any organism.

Ultrasonography of the abdomen and pelvis showed a grossly enlarged right kidney with hydronephrosis with multiple calculi in the renal pelvis, largest measuring about 3.3 cms in size with associated features of pyelonephritis (Figure 1).



Figure 1: Showing cut open specimen of the enlarged hydronephrotic kidney with a dilated pelvi-calyceal system and poor cortico-medullary differentiation.

A Computed tomography of the abdomen and pelvis confirmed the findings of the ultrasound.

There was an ill defined lesion of about (4.6\*3) cms, seen just anterior to the aorta and present adjacent to the right kidney, with loss of fat planes between the lesion and the right kidney. The lesion was seen compressing the Inferior Vena Cava. The right kidney was grossly enlarged measuring about (13.6\*6.4) cms, with a staghorn calculus measuring about (3.4\*1.9\*3.4)cms in the renal pelvis with associated pyonephrosis and findings suggestive of stage III XGP.

The left kidney was found to be normal in size and did not show any hydronephrosis or calculi. The patient underwent an emergency drainage of the pyonephrosis from the right kidney by the placement of a percutaneous nephrostomy drain. After optimization, the patient subsequently underwent a right radical nephrectomy. The immediate post operative period was uneventful. However the patient developed persistent hypotension in the post-operative period and subsequently died of septicaemia on post-operative day 2.

## Histopathology

On gross examination: the cut open specimen measured about (13\*8\*5.5) cms. Externally, the specimen appeared

lobulated, whitish, with the external surface showing multiple yellowish areas suggestive of abscesses. The pelvicalyceal system was dilated, with a lack of corticomedullary differentiation, with the cut surface showing a diffusely infiltrating greyish white tumour (Figure 2).

Microscopy from the tumour tissue revealed large round to polygonal cells, with pleomorphic and hyperchromatic nuclei arranged in cords and sheets. Abnormal mitosis was present. Also seen were large areas of tumour necrosis. These findings were suggestive of squamous cell carcinoma. Microscopy from the rest of the kidney tissue revealed thyroidisation of the tubules with glomerular sclerosis and periglomerular fibrosis. Interstitium showed dense infiltration by foamy macrophages and chronic inflammatory cells suggestive of Xanthogranulomatous pyelonephritis.

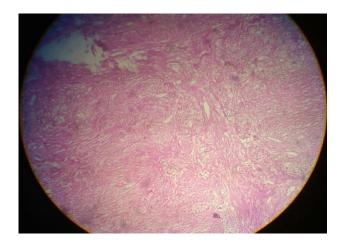


Figure 2: Showing the histopathology slide showing the presence of both XGP and SCC.

## **DISCUSSION**

Transitional cell carcinoma (TCC) is the more common variety of malignancy arising from the upper renal tract and the renal pelvis, whereas squamous cell carcinoma is uncommon with a reported incidence of only (0.5 to 0.8%).<sup>1,2</sup>

Chronic irritation is a known risk factor for the development of SCC of the kidney.<sup>3</sup> Chronic irritation, inflammation and subsequent infection lead to a metaplastic change in the urothelium of the collecting system with subsequent progression to dysplasia and carcinoma in situ.<sup>4,5,6</sup> Stag horn calculi are one of the common conditions associated with chronic irritation of the renal epithelium and may be considered as a risk factor for the development of SCC of the kidney. The pertinent medical history should thus always include chronic episodes of pyelonephritis or nephrolithiasis.<sup>7,8</sup>

SCC of the kidney is aggressive, often presenting as a high grade malignancy at the time of presentation and has a poor prognosis when compared to the other upper urinary tract malignancies. The diagnostic investigation of choice in a case of SCC of kidney includes Contrast CT scan. MRI findings have been rarely described in literature and have been found to be non specific. hence, there is usually no role of a MRI in the diagnosis of SCC of the kidney and often a histopathological confirmation is required for the diagnosis. 10-12

In our case, the patient's lesion was present anterior to the aorta with loss of fat planes with the right kidney. The kidney was found to be grossly enlarged with hydronephrosis and also showed features of stage III XGP with multiple calculi and a stag-horn calculus. An additional feature of the lesion was that it was seen compressing the IVC raising the suspicion of a malignancy. As reported by Raghavendran et al, a CT scan should always be done in patients with long standing renal calculi, considering the occurrence of SCC due to long standing irritation. <sup>13</sup>

A study by Lee et al found that an enhancing extra luminal and exophytic mass, and sometimes an intraluminal component were two of the most useful features on CT imaging of renal SCC.<sup>14</sup> Further it was suggested that for every patient with renal stone should undergo screening intravenous urography (IVU) periodically, especially, in those patients that present with a history of long standing stones, to check for the split function test for all portions of renal parenchyma. This was advised based on the observation that presence of filling defects, delayed excretion of the dye, or parenchymal thickening in IVU may indicate a renal tumor despite the absence of a solid mass and preservation of renal contour, thus warranting further investigations.

The occurrence of XGP and SCC together in the same kidney is extremely rare and there are very few case reports that have highlighted this feature in literature. Hence the importance and the need of our case report. XGP is a rare form of chronic pyelonephritis, associated with the destruction of surrounding renal parenchyma, often in the setting of obstructinve renal calculi. XGP may rarely progress to keratinizing squamous metaplasia. The histopathological and the radiological features of XGP closely mimic that of a renal neoplasm. Hence, the patients are often misdiagnosed as a case of renal malignancy. The exact treatment of SCC of the kidney remains unclear. However, surgery remains the mainstay of treatment. Because of advanced stage at presentation, surgical resection is rarely curative and adjuvant chemoradiotherapy is usually ineffective leading to a dismal prognosis and a 5 year survival rate less than 10%.2,7,12,15

#### **CONCLUSION**

We have reported this case to highlight the fact that a diagnosis of SCC should be considered in patients with long standing renal calculi, especially infected stag horn

calculi. Long standing renal calculi appear to be a risk factor for the development of both SCC and XGP of the kidney and the co-existence of XGP worsens the prognosis in a patient with SCC of the kidney, especially in the setting of an obstructed collecting system with pyonephrosis. Surgery though the mainstay of treatment for SCC, is often associated with a poor outcome owing to the advanced grade of malignancy at the time of presentation.

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