CASE REPORT

Squamous cell carcinoma; a rare complication of long-standing renal stones: Case report and an overview

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Abstract

Renal squamous cell carcinoma is an exceedingly rare and infrequent diagnosis, usually not suspected due to its rarity and non-specific radiological and clinical features. Patients are usually diagnosed at a late stage, with subsequent mortality. Surgical excision, usually a radical nephrectomy, remains the treatment of choice. We report a case of a 48-year-old female, presenting with generalised lower abdominal pain, who underwent a simple nephrectomy for a non-functioning kidney and was diagnosed as squamous cell carcinoma on a postoperative biopsy.

Keywords: Renal Calculi, Hydronephrosis, Carcinoma, Squamous Cell Carcinoma.

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Introduction

Primary squamous cell carcinoma (SCC) of the renal pelvis is an extremely rare entity, representing only 0.5% to 0.8% of all urothelial malignancies.[1] Diagnosis of renal squamous cell carcinoma is profoundly challenging due to the rarity of the disease, non-specific clinical manifestation, and lack of typical radiological features of other urological malignancies. Etiological factors and pathophysiology include long-standing renal calculi, infections, exposure to chemicals, hormonal imbalances, and Vitamin A deficiency.[2] This case report is about a 48-year-old female who was diagnosed with primary squamous cell carcinoma postoperatively on histopathological analysis of the renal tissue.

Case Report

A 48-year-old female presented to urology OPD at KRL General Hospital, Islamabad in August 2023, with generalised abdominal pain associated with dysuria for the last 2 months. The patient had no co-morbidities. She was admitted for work-up, and her ultrasonography showed a grossly dilated right renal pelvicalyceal system. Contrast Enhanced CT scan of the Abdomen and pelvis was done, which showed a grossly enlarged right kidney measuring 17 cm with a large staghorn calculus measuring 6x2.4 cm (1500 HU) at right Pelvi-Ureteric Junction (PUJ) extending into the renal pelvis, causing gross hydronephrosis, loss of renal parenchyma and paper thinning of cortex, along with multiple small calculi in the lower pole. No mass lesion was seen (Figure-1). The remaining labs, including Renal

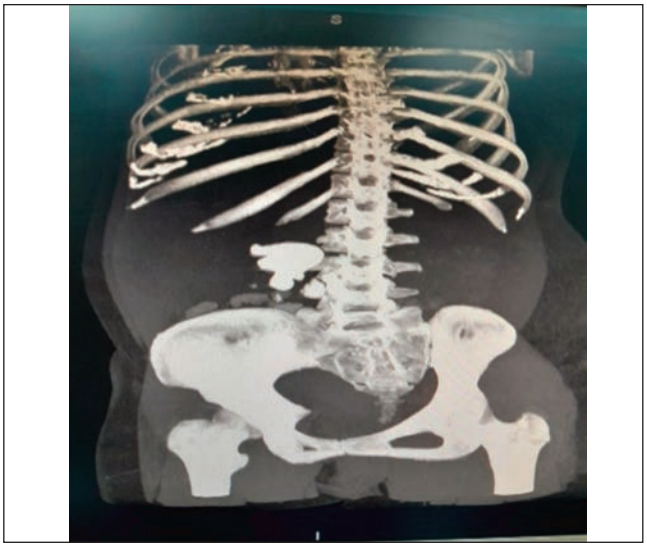

Figure-1: Presence of staghorn calculus in the right kidney.

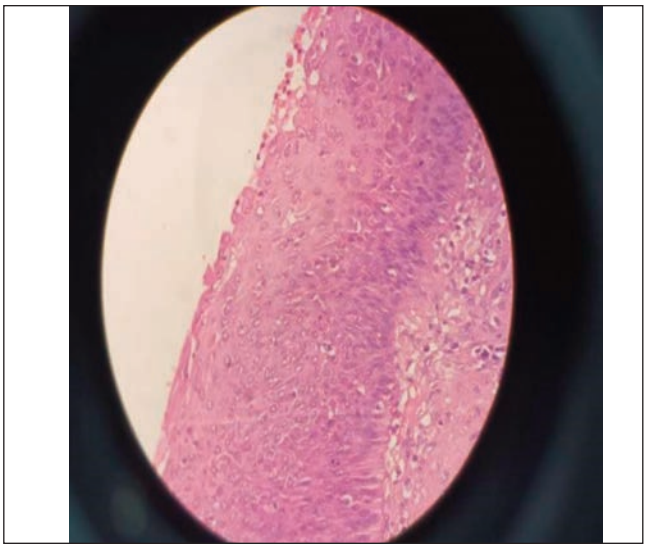

Figure-2: Tumour invades beyond muscularis into per pelvic fat or renal parenchyma.

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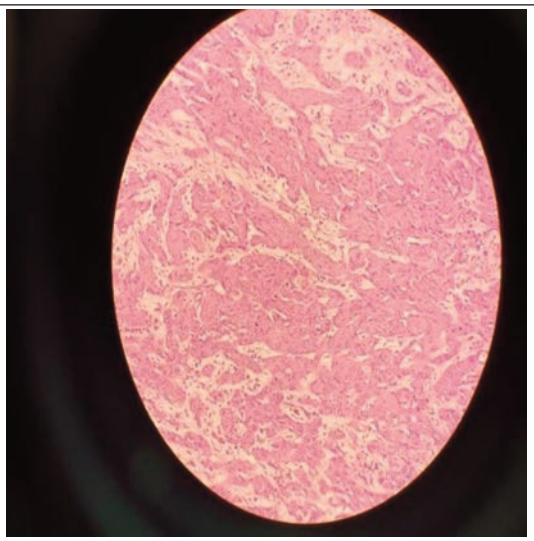

Figure-3: Squamous pearls.

Function Tests, and Electrolytes, were normal. The patient had a Diethylenetriamine pentaacetate (DTPA) scan to assess renal function, which showed a non-functioning kidney on the right side.

The patient underwent a right nephrectomy through a conventional flank incision. Per-op gross pyonephrosis was seen, with roughly 1200 ml of pus being drained. The post-operative course was uneventful. Subsequent histopathological examination revealed squamous cell carcinoma, moderately differentiated. Pathological stage: pT3Nx. Margins are uninvolved by invasive carcinoma. Sarcomoid features not identified (Figure-2 and 3).

The patient went for a repeat staging CT scan, which was clear. Since then, the patient has been on 6 monthly follow-ups, with no residual disease seen.

Discussion

The most common type of renal malignancy is clear cell carcinoma (75%), followed by papillary carcinoma (10%) and chromophobe carcinoma (5%).[3] Squamous cell carcinoma is very rare and is thought to arise from the renal collecting system. SCC consists of 0.5% to 0.8% of renal tumours.[1] There is a female predominance, and the mean age of onset is usually 50 to 70 years.[4] There is thought to be development of urothelial metaplasia resulting from a reaction to chronic irritation, which further progresses to de-differentiation, dysplasia, and in the end to an SCC; however, no definite cause has been established.[2] In our case, the tumour has been speculated to arise from chronic inflammation caused by chronic infections and a large staghorn calculus.

Given its rarity and nonspecific symptoms, squamous cell carcinoma (SCC) of the kidney is infrequently suspected or diagnosed preoperatively.

Patients may present with haematuria, flank pain, fever, or rarely an abdominal mass. Paraneoplastic syndromes may be seen including hypercalcaemia, leucocytosis, and thrombocytosis.[5]

The diagnosis of renal SCC is usually made after surgical resection and histological analysis of the resected specimen, as was seen in the present case. Contrast Enhanced Computed Tomography may give rise to suspicions as an enhancing extraluminal, intraluminal, or exophytic mass may be seen in cases of SCC. Radiological findings may include a solid renal pelvic or ureteric mass, unexplained hydronephrosis, renal calcifications, or regional lymphadenopathy. Differential diagnoses include tuberculosis, xanthogranulomatous pyelonephritis, and other renal neoplasms.[6]

Microscopically, primary renal SCC is similar to squamous cell carcinomas at other sites. In the present case, the tumour invades beyond the muscularis into peri-pelvic fat or renal parenchyma.

Patients with renal SCC usually present at an advanced stage, likely T3 or higher. Tumour recurrences are common and rapid. The mortality rate for patients with SCC of the upper urinary tract is higher as compared to patients with urothelial carcinoma.[7,8]

Surgery is considered the mainstay of treatment, usually a radical nephrectomy or nephroureterectomy.[9] Chemotherapy and adjuvant radiotherapy have been tried, but no definite survival benefit has been seen, nor has post-operative radiotherapy shown a survival benefit. Seeing the limited number of cases and poor mortality associated with the disease, further studies are required to gauge the effectiveness of chemotherapy and radiotherapy.[7,10]

Conclusion

Primary renal squamous cell carcinoma is a rare entity, often at an advanced stage at the time of diagnosis. As in the above case, the patient was diagnosed post-operatively on histopathological analysis. Per-op findings were equivocal with gross pus collection only and suggestive of recurrent chronic pyelonephritis. Patients presenting with long-standing renal calculi must undergo an appropriate diagnostic workup, especially if the kidney is non-functioning. Surgical resection is the treatment of choice, and it must be performed as soon as possible, considering the possibility and diagnostic difficulty of SCC and the histopathology of the nephrectomy specimens of these patients.

Consent: Written consent has been taken from the patient for publishing the case.

Disclaimer: None.

Conflict of Interest: None.

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Author Contribution:

HAS: Concept, design, drafting, revision and final approval.

AAK, SMH, MAA: Data acquisition, analysis, interpretation, drafting, revision and final approval.