Primary Squamous Cell Carcinoma of Kidney: Case Series of a Rare Renal Pathology

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Abstract

Primary squamous cell carcinoma (SCC) of renal parenchyma without a history of urolithiasis is a very infrequent entity and to the best of our knowledge, so far, only seven case reports are published. Renal SCC is usually associated with other conditions like renal stone disease, chronic inflammation, and infection, the imaging studies may ubiquitous and pose a diagnostic dilemma for practicing urologists. The role of treatment modalities like chemotherapy or radiotherapy is also not well defined. Here, we report 3 distinctive cases of Primary SCC with no history of renal stone disease or identifiable risk factor. We also present a current review of the literature and a detailed description of the morphological features.

Keywords: *Primary, Renal, Parenchyma, Squamous cell Carcinoma*

Introduction

The Primary squamous cell carcinoma (SCC) of the renal parenchyma represents less than 0.5% of all renal tumors and is usually associated with squamous metaplasia due to chronic irritation, history of kidney stones, and/or recurrent urinary tract infections.[1] Only rare case reports exist about renal SCC without the previously mentioned risk factors. The delay in diagnosis following deceptive symptomatology, without specific signs, often leads to a pejorative evolution leading to discovery at advanced stages and hence a poor prognosis.[2] Here, we report our three cases with clinical presentation, etiology, and outcomes.

Cases Reports

Case one

A 67-year-old diabetic male, presented to the urology clinic with painless gross hematuria associated with clots. He denied any history of urolithiasis or recurrent urinary tract infections. Examination revealed a ballotable mass on the right side of the abdomen. Urine cytology reported as a negative for malignant urothelial cells. Computed Tomography (CT) of the Chest and Abdomen demonstrated a 6 cm right renal mass with no metastasis, suspecting renal cell carcinoma (RCC) ***(Figure 1a)***. He underwent a right laparoscopic Radical Nephrectomy and the post-operative course was uneventful. Repeat CT scans after surgery**,** confirmed no early recurrence or residual disease.

The Histopathology showed, an eight cm moderate to poorly differentiated squamous cell carcinoma arising from the right kidney. The tumor cells showed diffuse and strong positivity for CK14, CK5/6, and p63. The tumor cells were negative for GATA3, Uroplakin, RCC, and PAX-8, and the associated squamous metaplastic lining of the renal pelvicalyceal system exhibited dysplasia highlighted by strong positivity for CK5/6, P63, and CK14 and negativity for Uroplakin and GATA 3. ***(Figures 1b, c and d)***, the pathological stage was pT4Nx. CT scan were performed at his last follow-up, nine months after surgery, and showed no evidence of disease recurrence. Cystoscopy does not show any tumor in the bladder and barbotage to the right ureter for cytology taken and resulted as a negative for malignant cells. He was seen in urology clinic, doing well and asymptomatic. He has a next follow up after six months with CT scan.

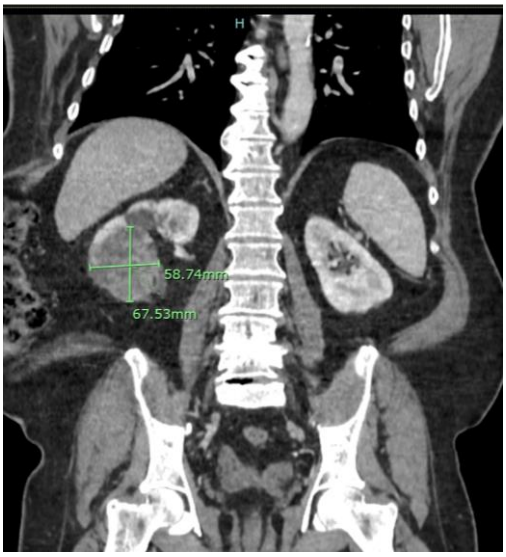

Figure 1a: CT scan Abdomen and Pelvis.

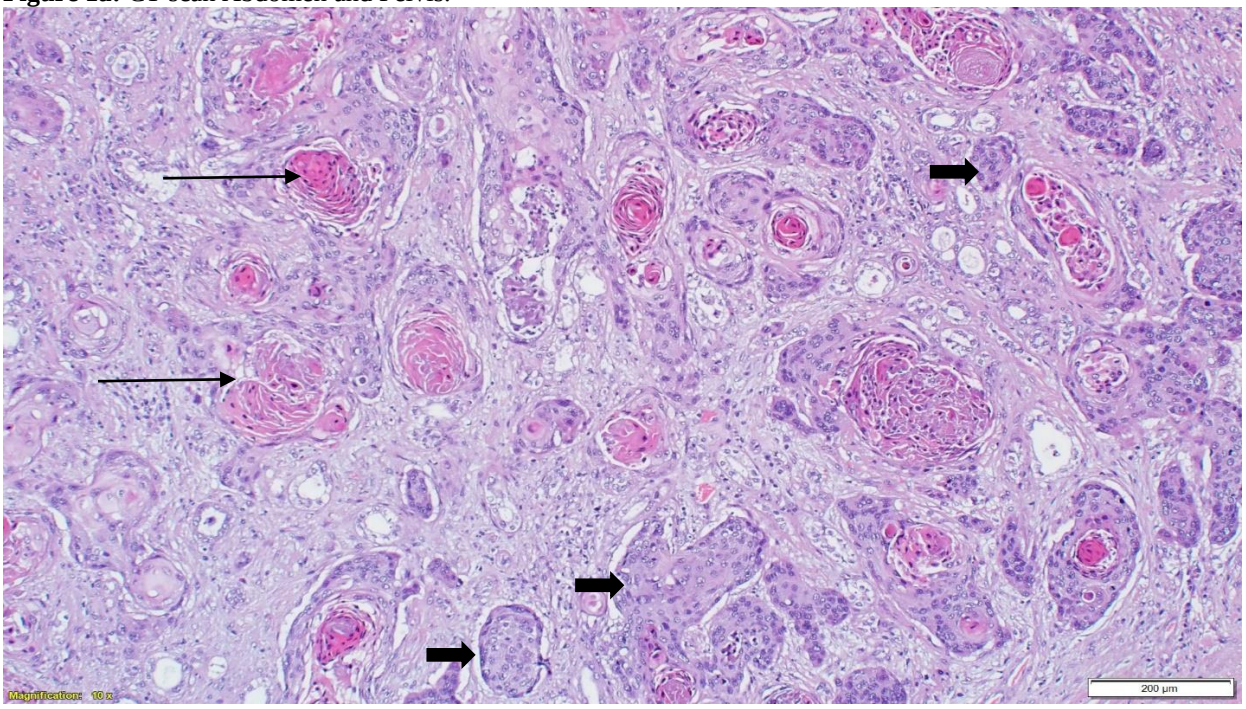

Figure 1b: Hematoxylins and eosin (H&E) photomicrograph of the patient's tumor no.1 showing nests of pleomorphic tumor cells (three block arrows) together with keratin pearl formation (two long, thin arrows) (original magnification × 200).

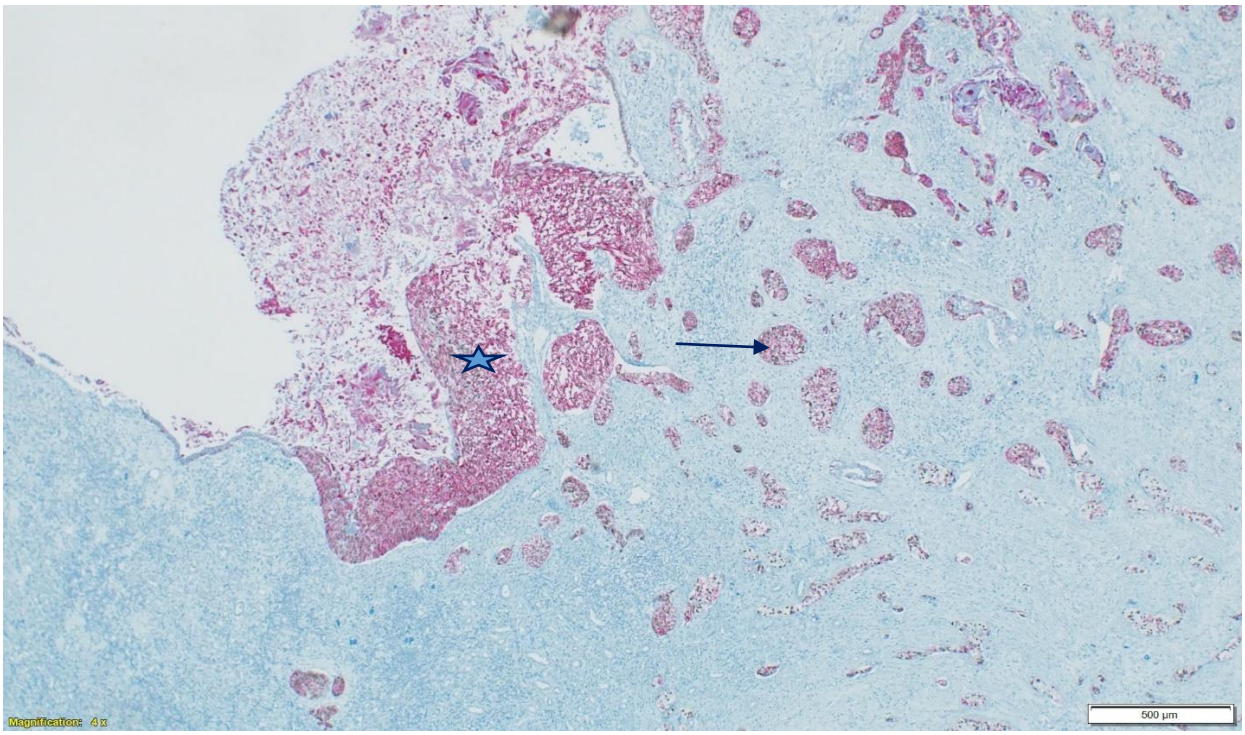

Figure 1c: Hematoxylin and eosin (H&E) photomicrograph showing P63/ CK5/6 immunohistochemical stains are positive in dysplastic squamous mucosa (star) and in the invasive tumor (long thin arrows).

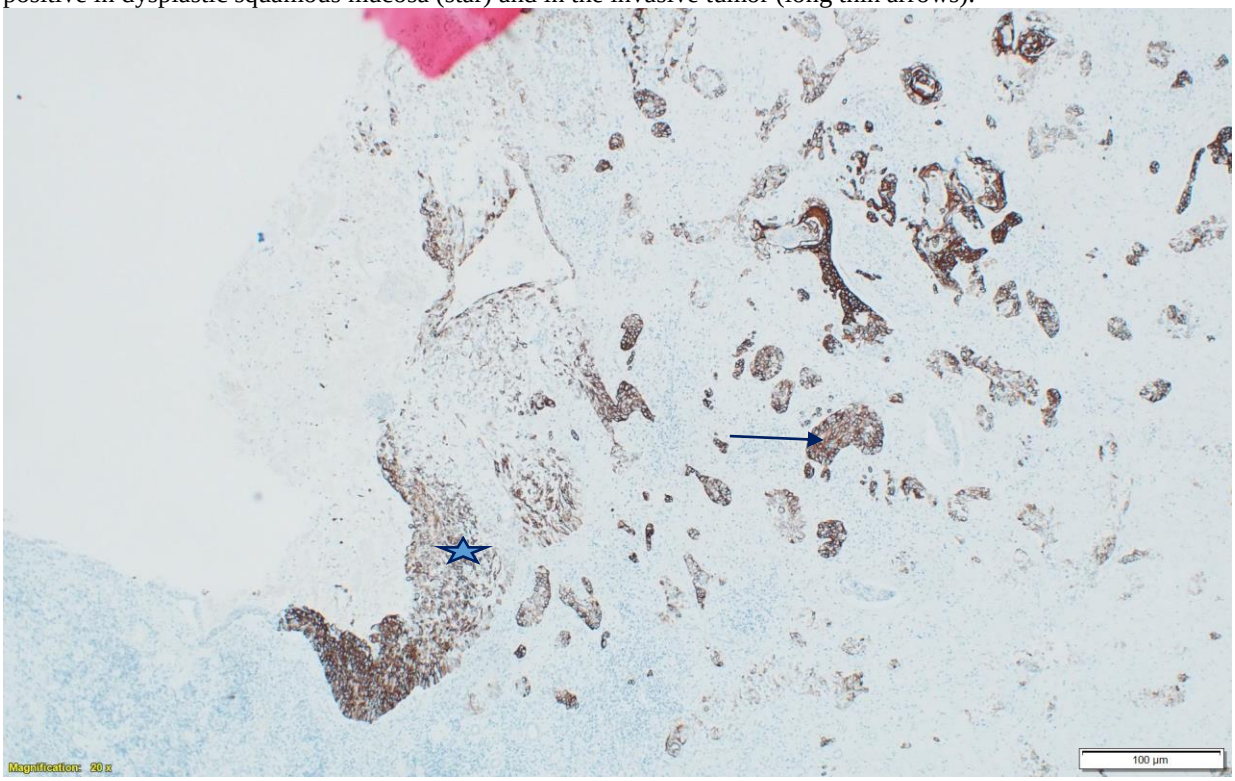

Figure 1d: Hematoxylin and eosin (H&E) photomicrograph showing CK14 immunohistochemical stain is positive in dysplastic mucosa (star) and in the invasive carcinoma (long thin arrows).(original magnification × 200).

Case two

A 50-year-old female was referred to urology service as a case of a right renal tumor and nephrocutaneous fistula. She had been complaining of right-sided flank pain for 4 months. She gave a remote past surgical history of psoas muscle abscess, >30 years ago. On physical examination, a fistulous opening was seen in the right flank area with minimal discharge.

CT scan showed a large tumor occupying the whole right kidney **(*Figure. 2a*)**. An MRI of the abdomen was also performed and showed a large heterogeneous lesion occupying the right kidney highly suggestive of a neoplastic etiology. Multiple enlarged retroperitoneal lymph nodes were also visualized. There was a loss of fat plane between the right colon and the mass ***(Figure. 2b, 2c)***. The patient underwent an open right radical nephrectomy, along with excision of the nephrocutaneous fistula tract. Due to adhesions with the right colon and suspected local invasion, *enblock* resection with right hemicolectomy was also performed.

Histopathology revealed moderately differentiated squamous cell carcinoma, arising from the pelvicalyceal system with a tumor size of 10 cm. The tumor extended into the perinephric soft tissue and obliterated the renal sinus. The tumor infiltrated the peri-colonic fat and nephrocutaneous fistula, and Lympho-vascular invasion was present. All margins and regional lymph nodes were negative. ***(Figure 2d)***.

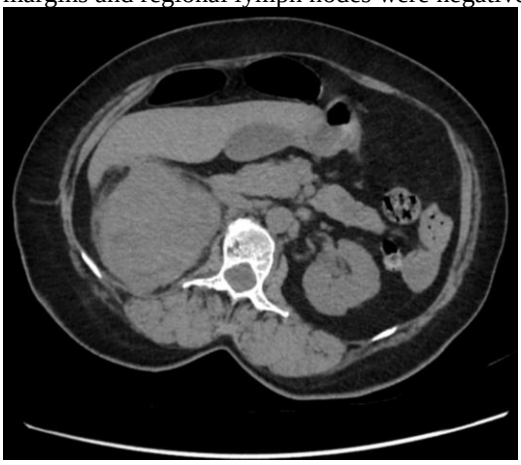

Figure 2a: CT scan Abdomen and Pelvis

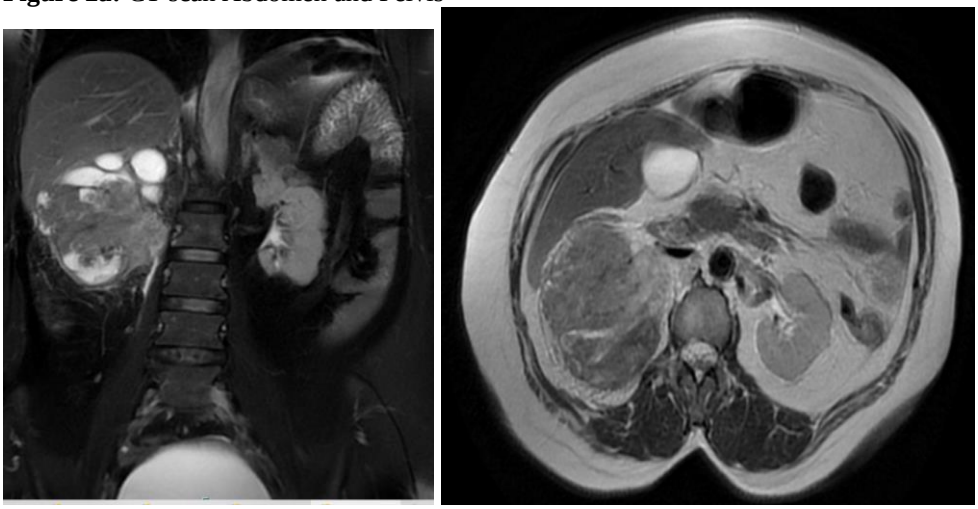

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Figure 2b and 2c: MRI Abdomen.

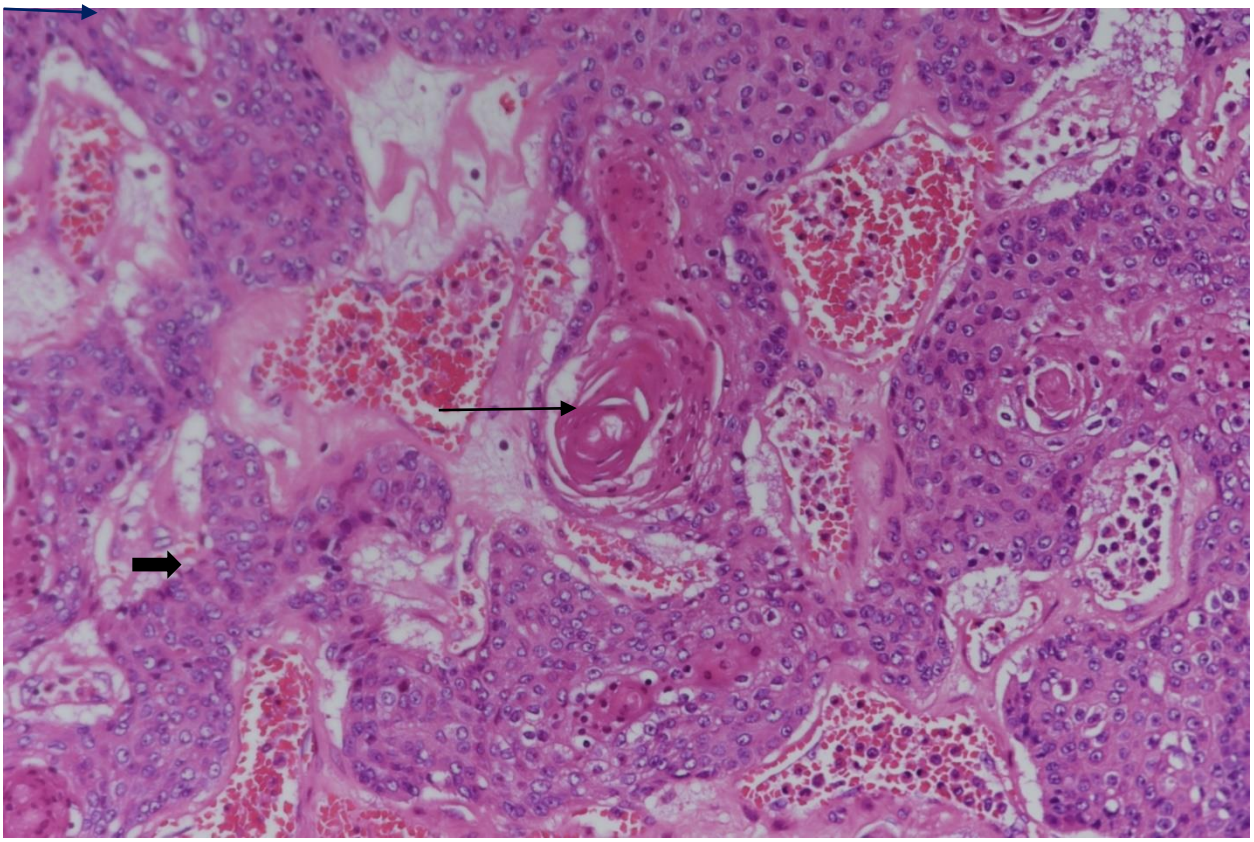

Figure 2d: Hematoxylins and eosin (H&E) photomicrograph of the patient's tumor showing nests of pleomorphic tumor cells (block arrow) together with keratin pearl formation (long, thin arrow) (original magnification × 200).

Case three

A 45-year-old male, a smoker for the last 20 years. He was seen in the urology clinic with a history of left flank pain and dysuria for one month. He denied any hematuria.

CT Abdomen was performed by the referring physician and showed a large complex cystic mass with calcification and solid components. Multiple para-aortic lymph nodes were visualized and a single 1 cm liver lesion was also seen. He underwent a left radical nephrectomy and a histopathology report showed a well-differentiated squamous cell carcinoma of the kidney with metastatic deposits to the lymph nodes. ***(Figure 3).***

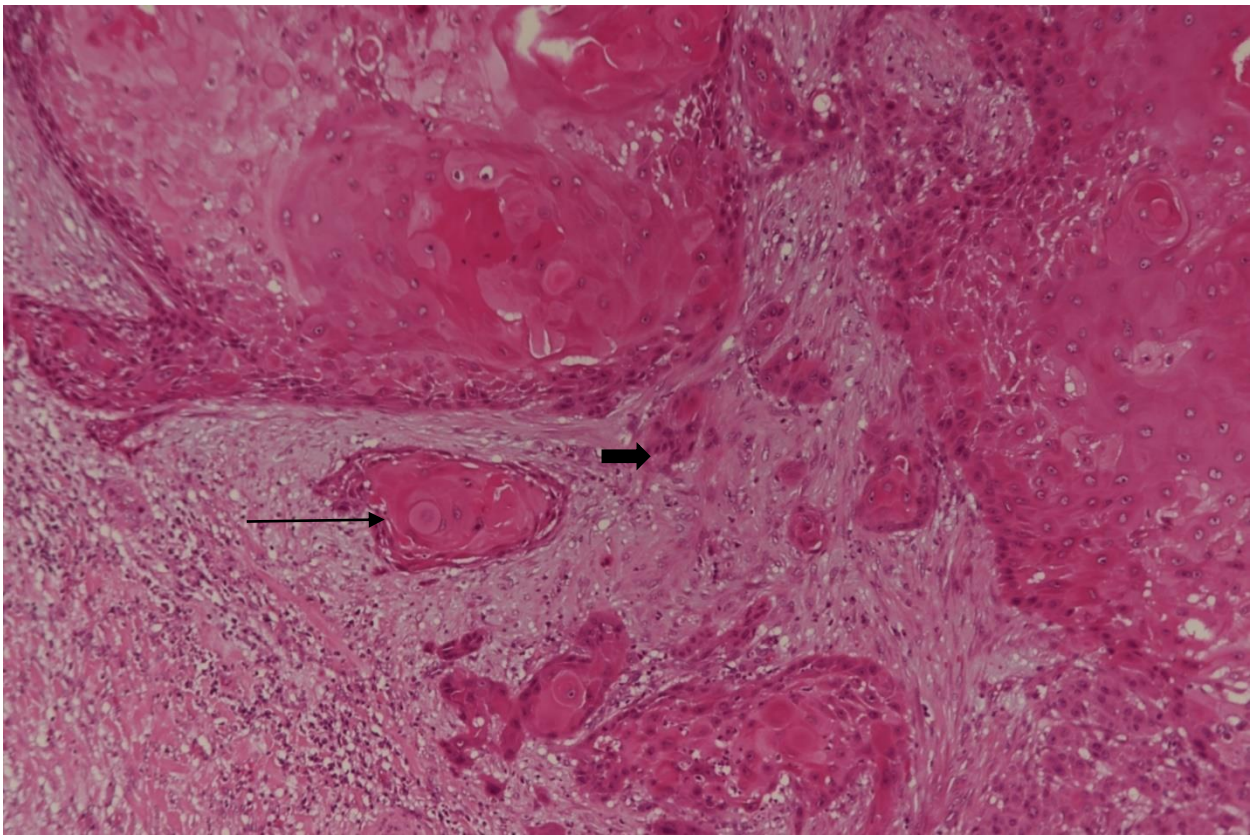

Figure 3: Hematoxylins and eosin (H&E) photomicrograph of the patient's tumor showing nests of pleomorphic tumor cells (black arrow) together with keratin pearl formation (long, thin arrow) (original magnification × 200).

Postoperatively six cycles of adjuvant chemotherapy with 5-FU and cisplatin were planned but had to be modified after the 1st cycle due to major toxicities including gastrointestinal grade I toxicity and febrile neutropenia requiring IV antibiotics (grade III). The dose of chemotherapy was reduced doses and after 3 cycles CT scan showed some reduction of his disease. He completed his 6 cycles, and post-treatment ET-CT showed FDG avid nodular lesions in the left renal fossa, mediastinal LNs, and multiple nodular pulmonary parenchymal lesions representing local as well distant recurrence. He commenced on 2nd line chemotherapy, which he could not tolerate and eventually, passed away, one year following his diagnosis.

Discussion

Primary squamous cell carcinoma represents less than 4% of malignant epithelial cancers of the upper tract. The risk factors are urolithiasis, recurrent upper urinary tract infections, and urinary schistosomiasis.[3] In our case series, none of the patients had a history of recurrent/neglected stone or chronic pyelonephritis or schistosomiasis. The absence of specific signs masqueraded by symptomatology of urolithiasis and the infective process has been postulated to the delay in diagnosis and thus a poor pathology. We propose that primary squamous cell carcinoma of the kidney may not always be related to a history of recurrent urinary tract infections and renal stone disease. It can arise de novo and is associated with poor prognosis.

In our case series, there were different modes of clinical presentation, case no. 1, presented with episodes of painless gross hematuria with clots, associated with symptoms of lower urinary tract symptoms. On workup, we did not find any renal stones. Case no. 2, presented with a nephrocutaneous fistula, and contrast-enhanced computed tomography (CT) scan revealed the presence of renal mass. This patient had a remote history of psoas abscess drained surgically 30 years ago with complete resolution and is unlikely to be a causative factor for chronic urothelial irritation. In case no. 3, there was a history of smoking (20 pack years) and presented with a history of flank pain and dysuria for one month. He didn't report feeling feverish and had no recent history of significant weight loss.

Transitional cell carcinoma is the most common type of upper tract cancer, originating in the renal pelvis followed by SCC which is relatively rare and affects predominantly women in the age group of 50 to 70 years. At the time of presentation, the age range of our patients was from 45 to 67 years. The most common symptoms were lumbar pain and hematuria. The pain in advanced SCC is attributed to urinary obstruction and/or local extension.[3]

Our literature review showed a recently published case report of a 79 -year an old woman, with no history of renal stone disease, recurrent urinary tract infection, or urinary schistosomiasis. She was diagnosed with a renal tumor and underwent nephrectomy. [4] The histopathology was reported as primary invasive SCC of renal parenchyma associated with foci of carcinoma in situ on squamous metaplasia in the calyxes. Dissimilar the many of the of the published cases of primary SCC of the kidney, our patients did not report a history of renal stones, urinary tract infections, and urinary schistosomiasis. The histopathological features of SCC on the cut section classically show renal parenchyma with an irregular surface. Heterogeneous tumors with solid and cystic components occupy a large portion of the kidney and may be associated with dual pathology. The tumor usually occupies most of the kidney and extends into peri-renal adipose tissue, as seen in our cases. Microscopic examination demonstrates renal parenchyma with areas of metaplastic stratified squamous epithelium together with dysplastic squamous mucosa. The tumor is mostly invasive in a nature, from moderately to poorly differentiated, mostly arranged in clusters and nests. Immunohistochemistry of renal SCC demonstrates presence of p63 along with CK5/6 stains in the dysplastic squamous epithelium or the invasive tumor without GATA-3 and the uroplakin staining in the mucosa and aggressive tumor. Fotovat A et.al[5] reported similar clinico-pathological structures of Primary renal SCC with an aggressive nature. Significant histological findings of SCC are keratin pearl formation and intercellular bridges. Renal rubber consistency and pasty keratin secretions were important findings in our patient.[5] All these mentioned microscopic and immunohistochemical features were similar in our patients.

Adjuvant or neoadjuvant chemotherapy is often used in metastatic SCC of the renal pelvis with a combination of cisplatin, methotrexate, and Bleomycin. However, it has a limited effect on the survival of the patients.[5]

Authors[6] has reported a similar rare case of primary renal parenchymal tumor. They report a 51-year-old male, who was presented with complaint of right flank pain, not associated with stone disease. On contrast enhanced compute tomography (CECT) scan, right renal lesion was detected, underwent total nephrectomy. Histopathology reported as well-differentiated squamous cell carcinoma with nests of large atypical squamous epithelial cells, associated with other features like keratin pearl formation, and focal area of necrosis in intra-renal parenchyma with entrapped glomeruli and tubules. Pelvi-calyceal system was free from tumor. No recurrence was identified after twelve months of follow up.[6]

Studies evaluating the role of chemotherapy in primary SCC of renal parenchyma have shown poor outcomes with a lack of an efficient treatment regime. Our third patient received six cycles of 5-Flouracil and Cisplatin with overall poor tolerability and lack of response to treatment and eventually passed away within 1 year of diagnosis. In our experience surgery at an early stage may be the best curative treatment. However, SCC of the renal pelvis usually presents at an advanced stage with infiltrated the adjacent tissue and the survival rate outcome is not good .[7] In our case series, the tumor was a primary renal parenchymal SCC detected in one male patient at an earlier stage and with 12 months of follow has remained disease free.

Conclusion

Primary renal squamous cell carcinoma is very rare and the usual risk factors may or may not be present. It is an aggressive disease, however, if diagnosed earlier, a good outcome is possible with Radical Nephrectomy.

Disclosure

The authors declared no conflict of interest. Verbal consent was taken from the patient.

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