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Case Report

High Grade Urothelial Carcinoma of Renal Pelvis - Case Report and Review

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ABSTRACT

Urothelial carcinoma, also named as transitional cell carcinoma of upper tract of kidney, which includes renal pelvis and / or ureter, constitute approximately 5% to 10% of primary renal tumors originating from the urothelium of renal pelvis. They are commonly seen in older individuals and have a male preponderance. They are similar to their counterparts in the urinary bladder. A male aged 68years presented to nephrology OPD with complaints of intermittent hematuria for 1 month. The excised right sided nephrectomy specimen was sent to our department of Pathology for histopathological examination. The urothelial tumors have poor prognosis. We report this case and review its literature along with it, due to its lower incidence rate.

Keywords: Renal pelvis, Transitional cell carcinoma, Urothelial carcinoma.

INTRODUCTION

Transitional cell carcinoma (TCC) of the renal pelvis or ureter accounts for less than 1% of genitourinary neoplasms and 5-7% of all urinary tract tumors. [1] Though the tumor constitutes a rare percentage, it is noted that the incidence is rising. [2] There is prevalence in adults, though pediatric cases have also been reported. [3] These tumors range from apparently benign papillomas to invasive urothelial (transitional cell) carcinomas. [4]

Smoking and industrial carcinogens are the prime risk factors associated with the neoplasm. In the past, phenacetin abuse was an important etiology in some populations, accounting for nearly one quarter of renal pelvic tumors, which has largely been eliminated now. [5] Some cases have also been observed following administration of Thorotrast for radiological purposes and as a complication of cyclophosphamide therapy. [3] The tumors can occur as manifestations of few hereditary cancer syndromes such as Lynch Syndrome and Muir-Torre Syndrome. [5]

Hematuria is the primary presenting complaint, but flank pain is also not infrequent.

CASE HISTORY

A non-diabetic, non-hypertensive male aged 68 years presented to the outpatient of the nephrology department with intermittent painless hematuria for 1 month. He also had generalized weakness with history of weight loss.

His general physical examination was normal. Per abdomen examination revealed tenderness in right flank region and punch test was positive.

Ultrasound of abdomen revealed solid, hypoechoic mass in renal pelvis measuring 2cm x 1cm in size. Per abdomen

CT scan was performed which showed soft tissue density with mild enhancement centered on the renal pelvis measuring 2cm x 1.5cm in size.

His routine surgical profile was insignificant excepting presence of blood in urine.

Right sided nephrectomy was performed and specimen was sent to our department of Pathology for examination.

Grossly, the right side nephrectomy specimen measured 12cm X 9cm X 8cm, smooth glistening surface. On cut section, the tumor measured 7cm X 5cm involving the cortex, medulla including the pelvis. Few satellite nodules were also present. No lymph nodes received.

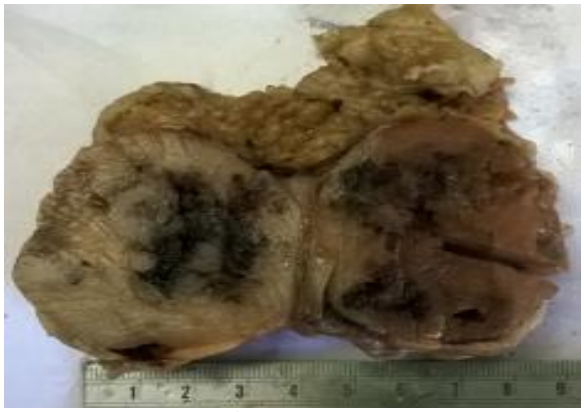

Figure 1: Cut section of right sided nephrectomy specimen with perirenal pad of fat showing tumor area.

The microsections from the specimen showed normal glomeruli and tubules and the tumor cells divided by the fibrous septa into lobules and in some areas papillary architecture was noted. Tumor cells which were pleomorphic with hyperchromatic nucleus and multiple nucleoli and abundant eosinophilic cytoplasm along with absence of umbrella cells. Numerous mitotic figures (10-12/10hpf) were seen. There were also focal areas of squamous metaplasia. Extensive areas of necrosis were present. Extension of tumor cells was seen in the perinephric pad of fat. Hence, the case was diagnosed as high grade urothelial carcinoma with squamous differentiation with TNM staging of $T_3N_xM_x$.

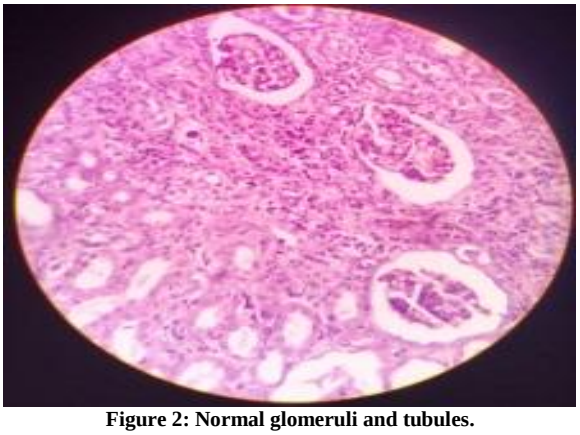

Figure 2: Normal glomeruli and tubules.

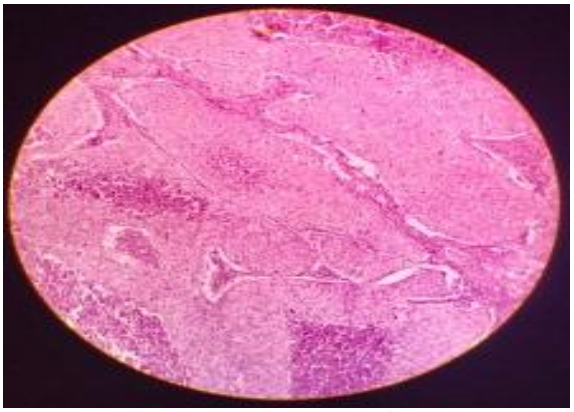

Figure 3: Tumor area is divided by fibrous septa.

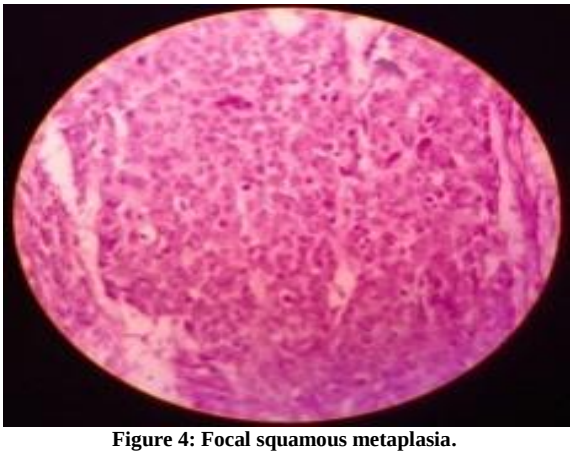

Figure 4: Focal squamous metaplasia.

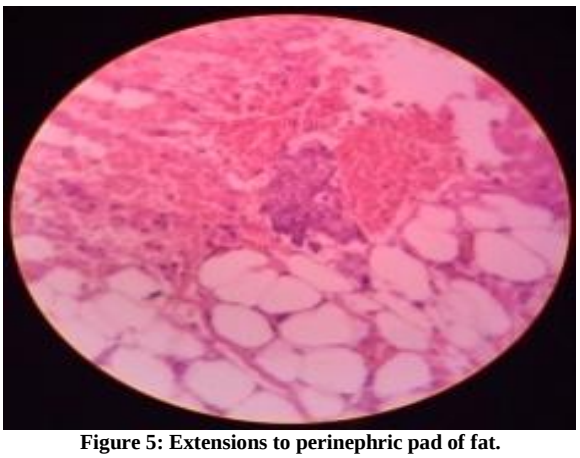

Figure 5: Extensions to perinephric pad of fat.

DISCUSSION

Papillary or Tubulopapillary Features
Papillary Renal Cell Carcinoma (RCC)
Collecting duct carcinoma
Clear cell papillary RCC
MiTF family translocation RCC
Urothelial carcinoma
RCC unclassified

In the differential diagnosis, renal epithelial neoplasms are to be pondered. Following is a table describing the various differentials. [6]

I Papillary RCC is the second most common subtype of RCC after clear cell. The features of differentiation between various tumors are jotted below. [6]

Features	Papillary Rcc	Collecting Duct Carcinoma	Clear Cell Papillary Rcc	Urothelial Carcinoma
Papillary/tubular pattern	Yes	Yes	Yes	Yes
Nuclear grade	Any	Usually high	Usually low	High
Stromal desmoplasia	Uncommon	Common	Absent	Common
Macrophages in papillae	Common	No	No	No
Dysplastic tubules	No	Occasional	No	Occasional
Intracytoplasmic mucin	No	Common	No	Occasional
Multifocal	Common	Uncommon	Occasional	Uncommon
Prominent nucleoli	May be	Often	No	May be
Perinuclear halos	No	Occasional	No	No

Microphthalmia - associated transcription factor (MiTF) family translocation RCC has prominent clear cell cytology and often papillary architecture. They have been reported in pediatric age group often, though adult incidence is coming up. [6]

The American Joint Committee on Cancer TNM pathologic staging of carcinomas of renal pelvis and ureter is followed for staging. [5]

American Joint Committee on Cancer TNM Pathologic Staging of Carcinomas of the Renal Pelvis and Ureter

Primary Tumor (pT)

pTX Primary tumor cannot be assessed
pT0 No evidence of primary tumor
pTa Papillary noninvasive carcinoma
pTis Carcinoma in situ
pT1 Tumor invades subepithelial connective tissue (lamina propria)
pT2 Tumor invades the muscularis
pT3 Tumor invades beyond muscularis propria into peripelvic/periureteral fat or the renal parenchyma
pT4 Tumor invades adjacent organs, or through kidney into the perinephric fat

Regional Lymph Nodes (pN)

pNX Regional lymph nodes cannot be assessed
pN0 No regional lymph node metastasis
pN1 Metastasis in a single regional lymph node, 2 cm or less in greatest dimension
pN2 Metastasis in a single lymph node, more than 2 cm but not more than 5 cm in greatest dimension, or multiple lymph nodes, none more than 5 cm in greatest dimension
pN3 Metastasis in a regional lymph node more than 5 cm in greatest dimension

Distant Metastasis (pM)

Not applicable
pM1 Distant metastasis

No definable muscularis mucosa exists in renal pelvis, thus for practical purposes any involvement of smooth muscle fibers indicates muscularis layer invasion.

Tumor multifocality is frequent and additional tumors may arise in the ureter, bladder, or on the contralateral side. [7] This is a noteworthy problem; hence surgical removal with radical nephroureterectomy and with select patients, segmental ureterectomy is treatment of choice. [8]

Immunohistochemistry is of limited value in these tumors, though co-expression of cytokeratin (CK) 7 and CK20 and / or p63 can be seen. [5]

DNA ploidy levels, as measured by flow cytometry, have been found to provide valuable prognostic information in several independent studies. [3] Absence of reactivity for paired box (PAX)-2 or PAX-8 would sustain for urothelial carcinoma. [5]

Urothelial carcinoma of the upper urinary tract is rare, but because 60% of these tumours are invasive at diagnosis. [9]

Grade and stage are the most important prognostic factors. [5] Microscopic grading is an independent prognostic aspect. Other features suggested to have a negative impact on the outcome include architecture (sessile or papillary), multifocality, simultaneous carcinoma in situ, the presence of lymphovascular invasion and the presence of extensive necrosis (>10% of the tumor). [5]

Infiltration of the wall of renal pelvis is common; hence the prognosis of the tumors is dire. The 5-year survival in selected patients after conservative surgery is reported to be 70-90%. [10]

The most common locations for metastases are regional lymph nodes and lungs.

CONCLUSION

The urothelial carcinoma of upper urinary tract, though exists as 5-7% of all urinary tract neoplasms, evidence indicates that the incidence is rising. The condition is uniformly fatal unless it is treated. The standard treatment, however, still remains surgical removal with radical nephroureterectomy and with select patients, segmental ureterectomy may be performed. The 5-year survival in selected patients after conservative surgery is reported to be 70-90%. Hence, diagnosing and reporting the cases are of great importance.

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