CASE REPORT

Long Standing Staghorn Calculus Leading to Squamous Cell Carcinoma of Kidney – A Case Report

Hemlata T. Kamra[1], Deepti Agarwal, Dhiraj Parihar[2], M. K. Garg[2], Ashish Shukla[3]*

[1]Department of Pathology, [2]Department of Surgery, [3]Department of Radiology, Bhagat Phool Singh Government Medical College for Women, Khanpur Kalan, Sonepat - 131305 (Haryana), India.

Abstract:

Squamous cell carcinoma, a rare malignancy of upper urinary tract accounts for 1.4% of all renal malignancies [1]. These tumours are mostly seen in the adults and less commonly in the pediatric age groups. Most of the cases present incidentally because they are masqueraded by pyonephrosis or hydonephrosis which occurs at an advanced stage of the disease and hence poor prognosis. A screening CT for long stand renal stone or newer imaging modalities are required for early detection and improving prognosis of the patients. Here we present a case of renal squamous cell carcinoma in 55 yrs old male with a staghorn calculus.

Introduction:

Squamous cell carcinoma represents 0.5% to 8% of malignant renal tumours [2]. Late onset of pain, solid mass with or without hydronephrosis and rarity of tumour are possible culprits behind the late diagnosis of this entity. There are only isolated case reports and scant case series of such cases in English literature [3]. The mean age of presentation is 56 years with no predilection for side [4]. We here present a case of incidentally detected, squamous cell carcinoma of kidney in 55 years old male patient associated with a staghorn calculus.

Case Report:

A 55 years old male patient presented to surgery outpatient department, with a high blood pressure of 200/90 mmHg, weight loss and on and off severe pain in left flank since last 4 months. Physical examination was unremarkable. Routine investigations of blood revealed Total Leukocyte Count (TLC) =19,000/cumm, differential leukocyte count (DLC) = P - 78%, L - 20%, M - 2% with normocytic normochromic anemia, Urea - 28 mg/dl, Creatinine - 0.8mg/dl, ESR - 40mm after 1st hour. Urinalysis showed plenty of pus cells/hpf. On ultrasonography of abdomen and pelvis there was a large staghorn calculus with mild hydronephrosis and IVP findings were suggestive of left sided staghorn calculus without any evidence of excretion of contrast from left kidney (Fig. 1).

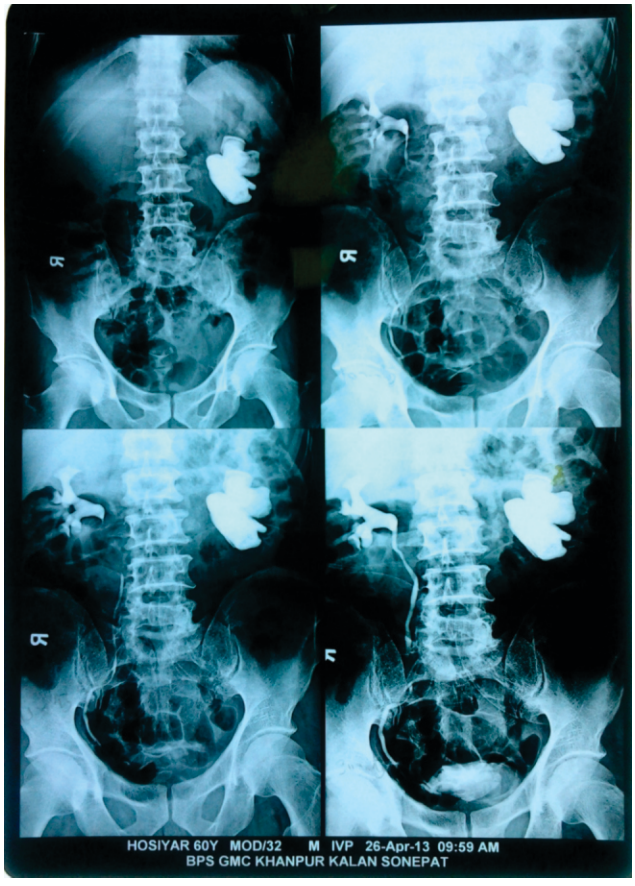

Fig. 1: IVP Film Showing a Staghorn Calculus on Left Side with No Excretion of Dye

Right kidney excreted the contrast normally without any evidence of back pressure changes. Diethylene Triamine Penta Acetic Acid (DTPA) renal dynamic scan showed enlarged hydronephrotic and hypoperfused left kidney. Renal cortical tracer uptake was severely diminished with peripheral cortical thinning. Relative photopenia was seen involving left kidney. Intrarenal parenchymal transit time was prolonged. Relative function of left kidney was 14.40% with GFR 9.8ml/min. Relative function of right kidney was 85.60% with GFR of 58.30ml/min. Left sided neprectomy was done under spinal anesthesia. Intraoperatively the kidney was edematous with pedicle having multiple peritoneal adhesions. On opening the kidney there was a staghorn calculus measuring 10x5x2cm along with pyonephrosis. On gross, an already cut open specimen of kidney was received with ureter of length 3cm. The capsule of kidney could not be identified. Externally the contour of kidney was completely distorted. Specimen of kidney measured 11.5x5x 3.5cm. On cut section a cavity was seen in the pelvis measuring 7x2cm. Cortex was thinned out measuring 0.3cm. Corticomedullary junction was unidentifiable. Parenchyma of kidney showed focal grey white areas surrounding the cavity (Fig. 2).

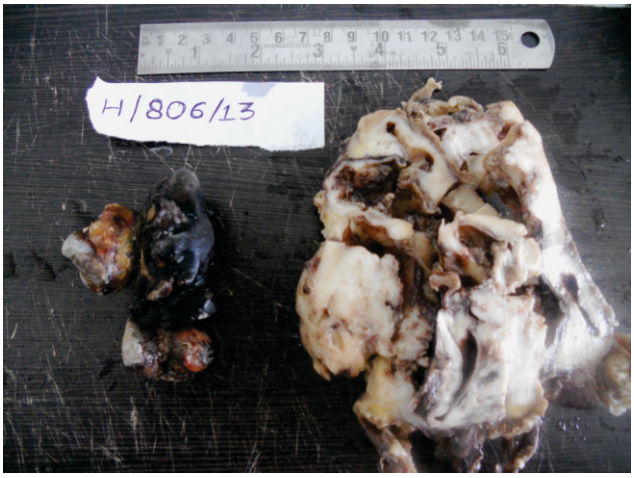

Fig. 2: Gross Photograph showing Staghorn Calculus along with Cut Surface of Kidney with Grey White Areas

Microscopically, sections studied from grey white areas revealed Squamous cell carcinoma with multiple keratin pearls (Fig. 3, 4).

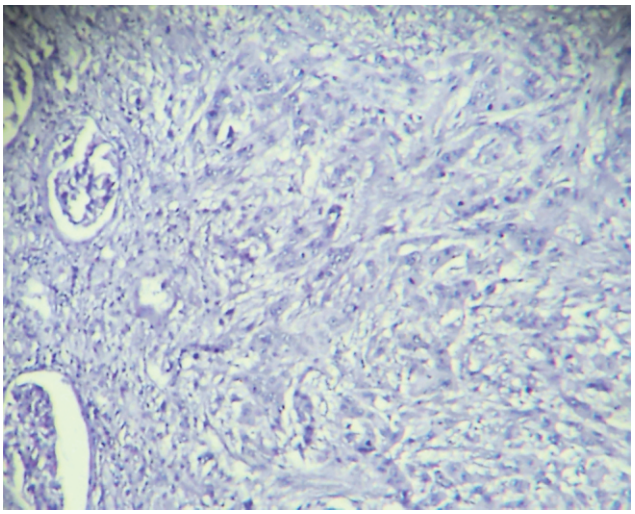

Fig. 3: Showing Squamous Cell Carcinoma Infiltrating into Renal Parenchyma (H&E stain, 3686x2981 pixels)

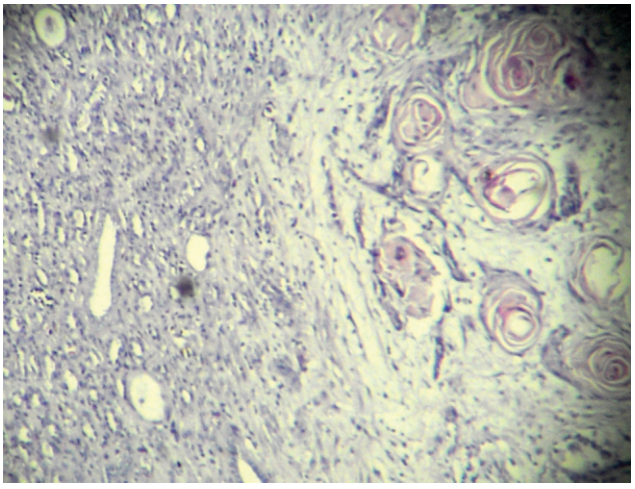

Fig. 4: Showing Keratin Pearls and Part of Kidney (H&E stain, 3913x3000 pixels)

Tumour was invading into the cortex, perirenal fat (Fig. 5), muscular wall of the proximal ureter (Fig. 6) and adventitia of one of the blood vessel. The distal part of ureter was free of tumour invasion. Surrounding renal tissue showed lymphocytic infiltration. The patient underwent CT scan in order to search for any metastatic lesion but there

was no evidence of lymph node enlargement or distant metastasis. The patient is advised to attend follow up clinic once a month.

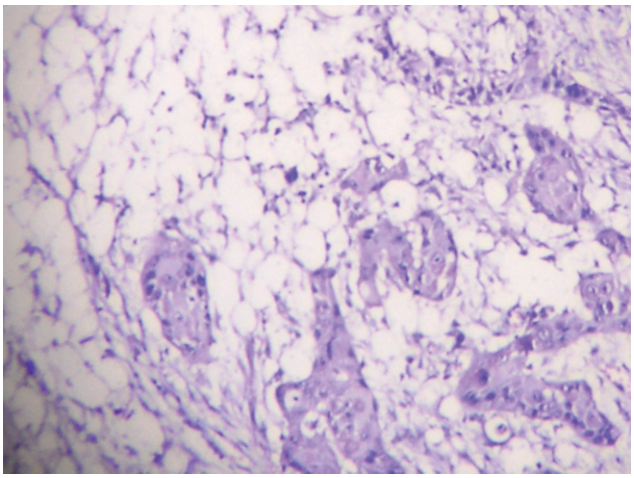

Fig. 5: Showing Infiltration of Malignant Cells into Perirenal Fat (H& E stain, 4000x3000 pixels)

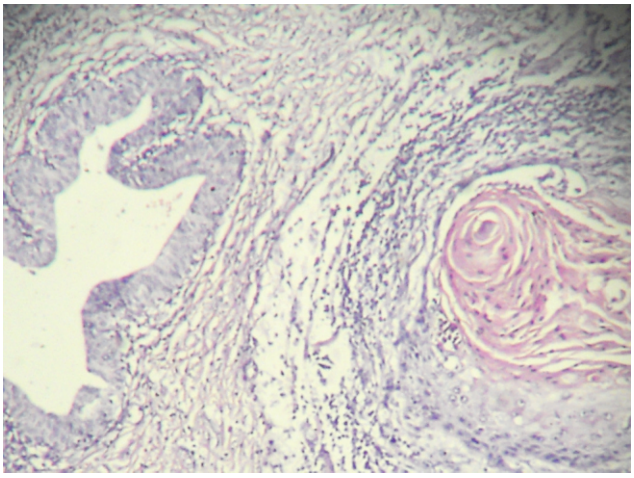

Fig. 6: Showing Invasion into Muscular Wall of Ureter (H&E stain, 4000x3000 pixels)

Discussion:

Kidney is an unusual site for squamous cell carcinoma which is known to arise from collecting system. The renal pelvis, ureter, bladder and proximal urethra are lined by transitional epithelium, therefore transitional cell carcinoma make up more than 90%, Adenocarcinoma 2%, Squamous cell carcinoma (5-10%), undifferentiated carcinoma (2%) and Mixed carcinoma (4-6%) [5]. Etiological factors include renal calculi, analgesic abuse (phenacetin consumption), smoking, infections, endogenous and exogenous chemicals, vitamin A deficiency, hormonal imbalance [5, 6]. The incidence of coexisting urinary stone has been 87, 18 and 100% in different series [6, 7]. Chronic irritation and infection are believed to induce reactive changes in the urothelium and leads to neoplasia via metaplasia and leucoplakia [6]. Squamous metaplasia in the adjacent mucosa is reported in 17-33% of the patients [8].

Conventional radiological findings of filling defects, obstructive lesions or nonfunctioning kidney by intravenous urography are all non specific. Most renal masses exhibit a well defined encapsulated appearance at radiological and gross pathological examination but in Squamous cell carcinoma, the tumour mass is not often evident as it tends to grow from the urothelium directly into the sinus and parenchyma [9]. Lee *et al* [7] have found that those most helpful features in CT of Renal Squamous Cell Carcinoma (RSCC) are presence of enhancing extraluminal and exophytic mass and in some cases an intraluminal component. Since CT scan is not possible in every case of filling defect, the delay in the appearance of pyelogram or renal parenchymal thickening on Intravenous Urogram (IVU) should be regarded as renal tumour despite absence of mass effects and preservation of renal tumour warranting further studies by CT or biopsy from renal pelvis or calyces [7]. Taylor et al [10] have reported that diminished vascularity is more characteristic in transitional or squamous cell carcinoma than in typical renal cell carcinoma. The radiological differential diagnosis includes primary and secondary neoplasms and xanthogranulomatous pyelonephritis associated with renal calculi.

Lee *et al* [7] in their study have further classified squamous cell carcinoma into two groups according to localization of tumour as central and peripheral type. They have stated that the central type presents more with intraluminal components and is

usually associated with lymph node metastasis whereas peripheral type presents with prominent renal parenchymal thickening and might invade the perirenal fat tissue before lymph node or distant metastasis could be identified. Holmang et al [4] have reported a clinical and histopatological review of 65 patients with RSCC and compared it to 743 patients with transitional cell carcinoma. They have reported that RSCC is larger than TCC and macrohematuria is more common in patients with TCC than RCC at the time of diagnosis.

Paraneoplastic syndromes associated with renal SCC are hypercalcemia, leucocytosis and thrombocytosis. Prognosis is poor because of early metastatic spread. Stage for stage, the prognosis is not different between patients with urothelial carcinoma and squamous cell carcinoma of the renal pelvis and ureter. 94% patients present in advanced stage, 21% are reported when they are not eligible for surgery due to associated comorbidities or advanced disease [4]. Survival is usually not more than 5 years.

Surgery in the form of nephrectomy is the mainstay of therapy with adjuvant chemotherapy with cisplatin, methotrexate and bleomycin as indicated.

In our case, the patient recovered well after surgery, his blood pressure normalized to 130/ 80mmHg.

Conclusion:

In cases with long standing stone disease where suspicious grey white areas or parenchymal thickening is seen, fresh frozen section can be done which can result in better resection of the tumour. Lavage cytology is another simple procedure which is particularly valuable in pelvic tumours. New treatment modalities are still needed to improve poor prognosis of patients. In patients with long standing renal stone who don't need intervention or patients who undergo extracorpeal shock wave lithotripsy or patient with non functioning kidney should be carefully examined with imaging modalities so early detection may provide better outcome for the patients. A screening CT would be a cost effective, high yielding and beneficial test.

References:

1. Tyagi N, Sharma S, Tyagi SP, Maheshwari V, Nath P, Ashraf SM, Srivastava AN. A histomorphologic and ultrstructural study of the malignant tumors of the renal pelvis. *J Postgrad Med* 1993; 39(4):197-201.
2. Jain A, Mittal D, Jindal A, Solanki R, Khatri S, Parikh A, Yadav K. Incidentally detected squamous cell carcinoma of renal pelvis in patients with staghorn calculi: case series with review of the literature. *ISRN Oncol* 2011:620574.
3. Singh V, Sinha RJ, Sankhwar SN, Mehrotra B, Ahmed N, Mehrotra S. Squamous cell carcinoma of the kidney-rarity redefined: case series with review of literature. *J Cancer Sci Ther* 2010; 2(4): 85-90.
4. Holmang S, Lele SM, Johansson SL. Squamous cell carcinoma of the renal pelvis and ureter: incidence, symptoms, treatment and outcome. *J Urol* 2007; 178(1): 51-56.
5. Zingade AP, Bhange SR, Joshi AR, Rane NK, Bhatt NC. Primary squamous cell carcinoma of horse shoe kidney- A case report. *Indian Journal of Applied Research* 2013; 3(5):465-466.
6. Li MK, Cheung WL. Squamous cell carcinoma of the renal pelvis. *J Urol* 1987; 138(2):269-271.
7. Lee TY, Ko SF, Wan YL, Cheng YF, Yang BY, Huang DL, Hsieh HH, Yu TJ, Chen WJ. Renal squamous cell carcinoma: CT findings and clinical significance. *Abdom Imaging* 1998; 23(2):203-208.
8. Melamed MR, Reuter VE. Pathology and staging of urothelial tumors of the kidney and ureter. *Urol Clin North Am* 1993; 20(2):333-347.
9. Wimbish KJ, Sanders MM, Samuels BI, Francis IR. Squamous cell carcinoma of the renal pelvis. Case report emphasizing sonographic and CT appearance. *Urol Radiol* 1983; 5(4):267-269.
10. Taylor WN, Shelgren JD, Park MD, Hartz JW and Boyce WH. Debility, recurrent fever, hydronephrosis and upper calyceal deformity in a 72 years old man. *J Urol* 1981; 125(4):565-567.

[*] ***Author for Correspondence:*** *Dr. Hemlata Kamra, B-15, Bhagat Phool Singh Government Medical College for Women Campus, Khanpur Kalan, Sonepat Haryana – 131305 (Haryana) India.*
Cell: 08221883255 Email: hemlatamunde@rediffmail.com