

A Rare Case of High-Grade Urothelial Carcinoma of Renal Pelvis and Proximal Ureter with Divergent Differentiation

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Article History	Abstract
<p>Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 25 Nov 2023</p> <p>CC License CC-BY-NC-SA 4.0</p>	<p><i>Urothelial carcinoma with divergent differentiation is a variant of urothelial carcinoma and it is being increasingly recognized with the increase in awareness and advancement of immunohistochemistry. It is important to quantify the degrees of each differentiation for the prognosis and treatment of the patient. Here, we present a unique case of urothelial carcinoma of Renal pelvis with divergent differentiation showing urothelial, squamous, papillary, glandular, Rhabdoid and Plasmacytoid differentiation.</i></p> <p>Keywords: Urothelial carcinoma, Divergent differentiation, Renal pelvis</p>

1. Introduction

Urothelial carcinoma is the most common malignant neoplasm of urinary tract characterized by propensity for divergent differentiation. 90% occur in the urinary bladder, 5 – 10 % in upper urinary tract. Renal pelvis Urothelial carcinoma is associated with high risk of distant metastasis to lung. (1) The World health organization / International society of Urologic pathologists (WHO / ISUP) 2016 classification has enumerated many of its histological variants. We are reporting a very rare case of high-grade urothelial carcinoma of renal pelvis with divergent differentiation.

Case Report

A 55 years old female presented in the casualty with pain in the right loin since 3 weeks and pain was radiating to the abdomen along with history of two episodes of hematuria and two episodes of passage of clots in urine. She also had history of passing clear streak of blood in urine following urination. Patient had given history of dysuria and loss of weight and appetite for the past 2 months. The patient had attained menopause 5 years back and refused any history of smoking and family history of any urological malignancy.

On NECT illdefined high density fullness was noted in the upper pole posterior aspect of the right kidney involving the pelvicalyceal system – 6 x 6 x 7 cm and proximal ureter. CECT abdomen with MRI screening showed a lesion with mild delayed heterogenous enhancement irregular wall thickening at pelvis, proximal ureter with mild perinephric / ureteric standing and was reported as transitional cell carcinoma of right renal pelvis and proximal ureter with tumor invading the right renal vein and adjacent IVC segment. Following other investigations nephroureterectomy was done and specimen was sent for histopathological examination. On gross examination Nephrectomy specimen was measuring 11.5x5.5x4.5cm. On c/s an ill-defined circumscribed lesion was identified in the pelvicalceal region m/s 5x4cm along with a friable hemorrhagic mass in the proximal part of ureter.



On microscopical examination the tumor was a partly encapsulated infiltrative lesion composed of atypical urothelial cells arranged in diffuse sheets, nests, irregular branching papillae with

fibrovascular core. Individual cells are round with abundant eosinophilic cytoplasm exhibiting moderate nuclear pleomorphism, vesicular nuclei and prominent nucleoli. Also seen were areas of divergent differentiation such as squamoid, glandular, oncocytic, plasmocytoid, rhabdoid and clear cell type of differentiation with evidence of invasion into proximal ureter, renal vein, perinephric fat and upper pole of kidney.

CAP Protocol for Renal Pelvis and Ureter

- Specimen – Kidney with ureter
- Specimen laterality – Right
- Procedure – Nephroureterectomy
- Tumor site – Renal pelvis
- Tumor size – 5x4 cm
- Histologic type – Urothelial carcinoma with divergent differentiation
- Histologic grade – High grade
- Tumor configuration – Solid
- Tumor extension – Tumor extends into renal parenchyma
- Margins – Proximal ureter involved
- Lymphovascular invasion – Present
- Regional lymph nodes – Not submitted
- TNM staging – pT3

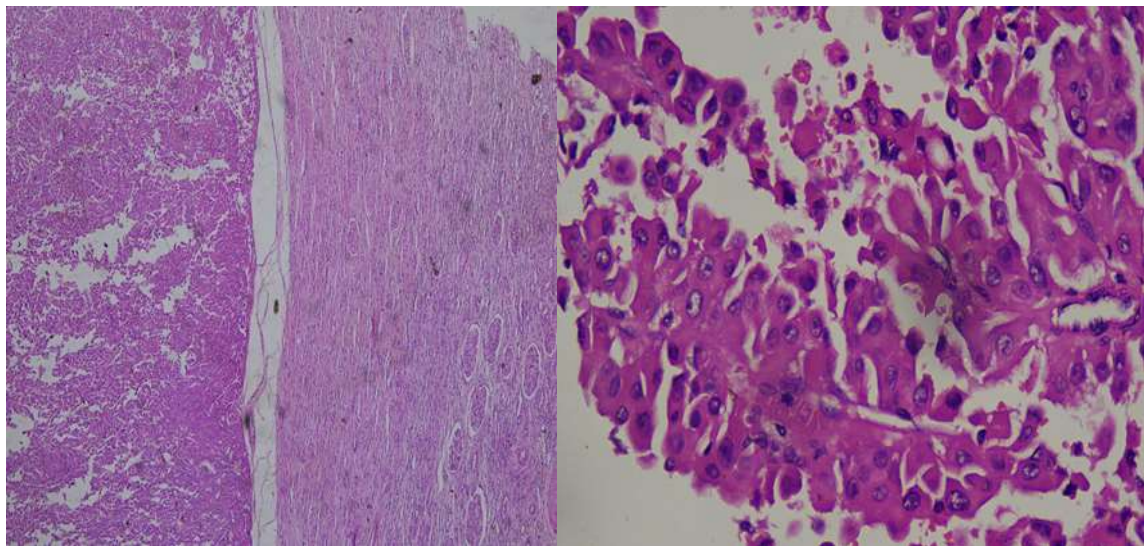


Figure 1: Tumor with renal parenchyma

Figure 2: Urothelial cells in papillary pattern

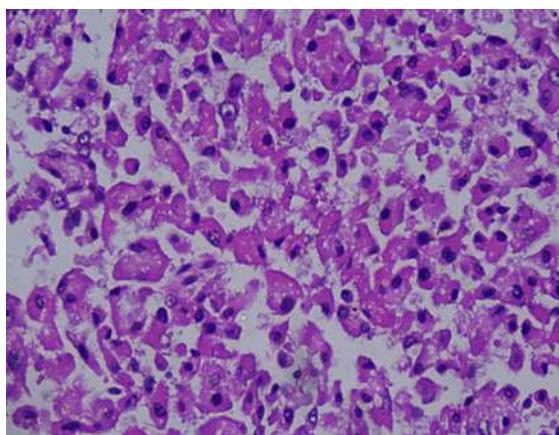


Figure 3: Plasmacytoid differentiation

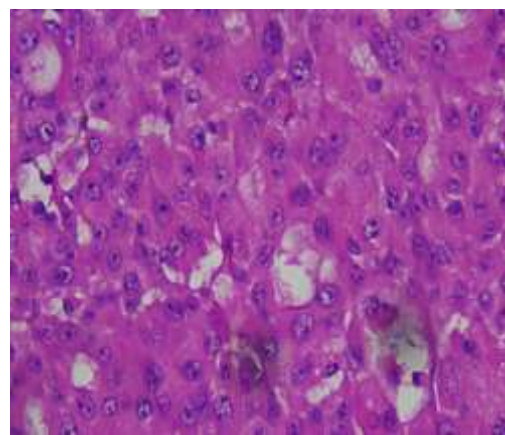


Figure 4: Squamous differentiation

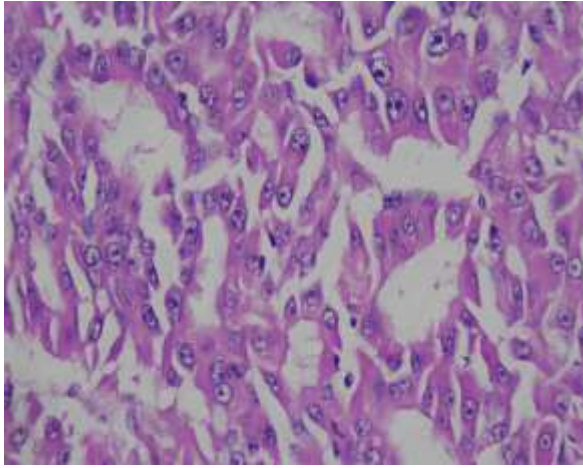


Figure 5: Glandular differentiation

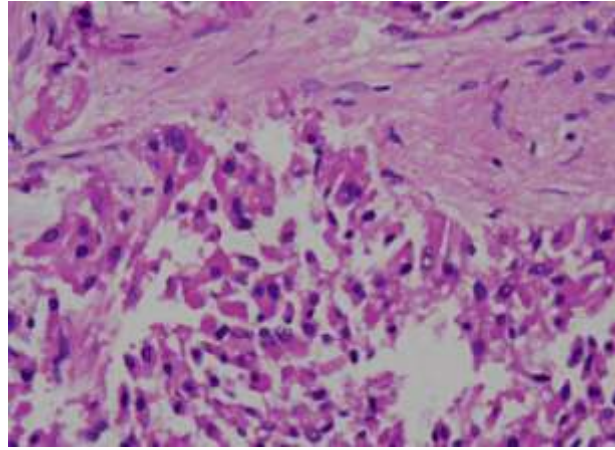


Figure 6: Rhabdoid differentiation

2. Results and Discussion

Urothelial carcinoma is one of the most common cancers worldwide. It is more common in older age males. It can arise anywhere within the urinary tract, but most commonly from the urinary bladder and the other sites include ureter, renal pelvis, and proximal urethra. Many risk factors have been identified for urothelial carcinomas, some of them are tobacco smoking, occupational exposures, chemicals, urinary tract infection, genetic factors, chronic inflammation, and irradiation. ⁽²⁾ Almost 90% of the urothelial carcinomas are conventional urothelial carcinomas, the rest of the urothelial carcinomas are urothelial carcinoma with divergent differentiation or non-urothelial carcinomas. Based on the recent WHO 2016 classification of bladder tumors, about 11 histologic variants of urothelial carcinoma are recognized such as the urothelial carcinoma with divergent differentiation, nested variant, microcystic, micropapillary, lymphoepithelioma like carcinoma, plasmacytoid, sarcomatoid, giant cell variant, lipid rich variant, clear cell, and poorly differentiated variant. ⁽¹⁾ Urothelial carcinoma with divergent differentiation is associated with squamous cell differentiation, glandular differentiation, with trophoblastic differentiation, and small cell differentiation. The squamous differentiation was found to be the most common type accounting for about 20–40%, the glandular differentiation was seen in 6–18% and syncytiotrophoblastic giant cells are seen in 28–35% of urothelial carcinomas with divergent differentiation. ⁽³⁾ Makise et al. report a case of urothelial carcinoma with squamous, glandular, and plasmacytoid differentiation confirmed by immunohistochemistry. ⁽⁴⁾ Our case of urothelial carcinoma was diagnosed by Nephrectomy. Perez-Montiel D et al done a clinicopathologic study of 108 cases with emphasis on unusual morphologic variants They suggest that these tumors are associated with a higher stage at clinical presentation and these patients were found to have a locally aggressive disease. ⁽⁵⁾ Genetic studies have indicated that the variants of urothelial carcinomas arise from a common clonal precursor. Thus, extensive search for divergent differentiation in urothelial carcinomas must be done by the pathologist.

3. Conclusion

Renal pelvis urothelial carcinoma is prone for divergent differentiation and can be misdiagnosed for some other diagnosis hence all morphological variants should be checked for in the sections. Also this carcinoma is associated with high risk of distant metastases to lung. Hence utmost care is taken while reporting.

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