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High-grade Neuroendocrine Carcinoma With Focal Squamous Metaplasia of Renal Pelvis Associated With Renal Calculus: Study of a Case☆

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ABSTRACT

Mixed neuroendocrine and non-neuroendocrine type of tumor in renal pelvis is rare and presents a high-grade malignancy. We present a case report that a 57-year-old man had no history of small cell cancer but presented a high-grade neuroendocrine carcinoma with focal squamous metaplasia and multiple stones simultaneously in the right renal pelvis. The patient underwent nephroureterocystectomy 9 months before this presentation, with evidence of multiple metastatic tumors in various parts of the body. The case of mixed neuroendocrine tumor with stones in the renal pelvis carries a poor prognosis and poses a therapeutic challenge to urologists.

Introduction

High-grade neuroendocrine carcinomas, which are also known as poorly differentiated neuroendocrine carcinomas, arise more frequently in the lung, and approximately 2.5% occur in extrapulmonary sites, including the genitourinary tract.[1] Neuroendocrine tumors of the urogenital system accounts only for a small proportion, and urinary bladder and prostate are the common occurrence sites. Renal neuroendocrine tumor is a very rare and poorly differentiated cancer and comprised a group of highly malignant tumor cell types associated with poor outcome and short survival. Compared with parenchyma-arising neuroendocrine tumors, the pelvis-arising neuroendocrine tumors are more rare and more likely to present mixed neuroendocrine and non-neuroendocrine type.[2] In this study, we report a case of high-grade neuroendocrine carcinoma with focal squamous metaplasia of renal pelvis associated with renal calculus, which is extremely rare. Only 2 cases of renal pelvis carcinomas reported in the previous English-language literature were consistent with such histopathologic features.[3,4]

Case presentation

A 57-year-old man presented with right flank pain and microscopic hematuria for 15 days. Ultrasonography revealed multiple stones in the right pelviureteral site, accompanied hydroureteronephrosis and a space-occupying mass. Intravenous pyelogram showed right pelviureteral nonvisualization. Computed tomography revealed stones along with upper-ureteric thickening and dilating and a 28 × 27 mm uneven enhancing mass in ureteropelvic junction. No enlarged mesenteric lymph nodes and retroperitoneal lymph nodes were observed, and no thrombus in the renal vein and inferior vena cava (Fig. 1). Percutaneous nephrolithotripsy was performed to remove the stones and establish diagnosis. Initial impression of biopsy specimens reviewed by the pathologist was that of urothelial carcinoma with necrosis. In view of the malignancy, the patient underwent radical nephroureterocystectomy, and a nodular and sessile tumor measuring 3.0 × 2.5 × 1.7 cm with gray-whitish cut surface was found in the dilated pelvis of the resected specimen (Fig. 2). A final diagnosis of high-grade neuroendocrine carcinoma with focal squamous metaplasia was rendered (Fig. 3). Preoperative and postoperative systemic examinations detected no tumors in other sites.

The patient did not receive chemotherapy after surgery. Six months later, postoperative review showed some enlarged

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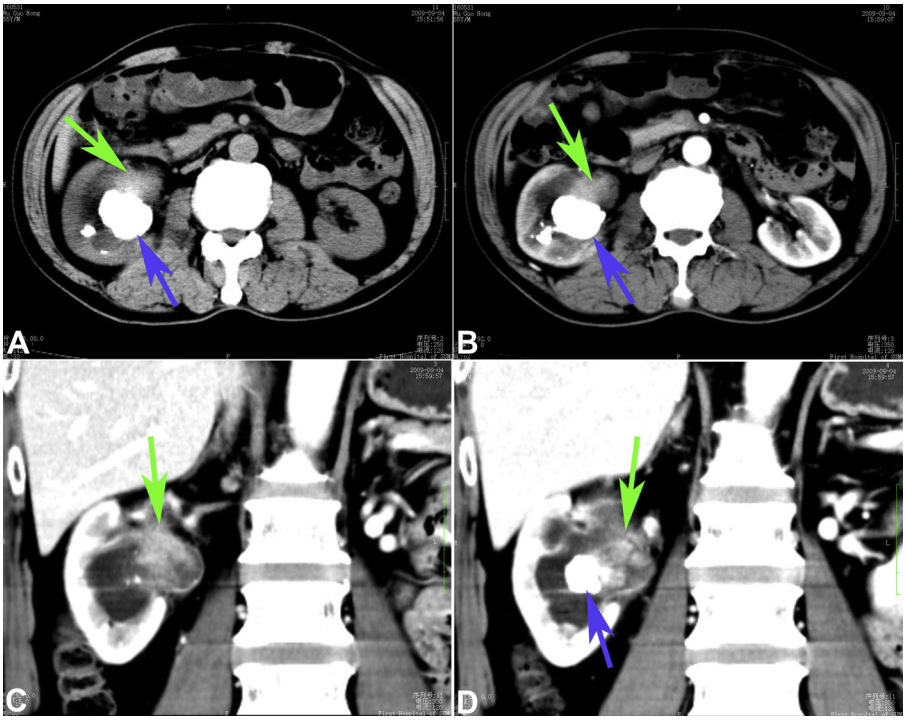

Figure 1. Computed tomographic plain scan shows multiple stones within the right renal pelvis and calyceal, an irregular soft tissue mass in the ureteropelvic junction **(A)**. Uneven enhancing visualization appears in the mass along with an upper-ureteric thickening in the enhancement scanning **(B)**. Right hydronephrosis reconstruction was obtained in images **(C, D)**.

retroperitoneal lymph nodes and no metastatic tumors found in other anatomic sites using the computed tomography detection, and the patient had no subjective symptoms except discomfort of the operative site. However, 9 months after the surgery, multiple metastatic tumors were found in the lung and liver, and the patient presented cachexia.

Discussion

The histogenesis of high-grade neuroendocrine carcinomas, independently of the site of origin, remains controversial and needs further studies. Some people consider they originate from urothelial cells with the neuroendocrine differentiation or neuroendocrine cells presenting in renal pelvis, some authors hold that these tumors originate from the entrapped neural crest in the kidney during embryogenesis.[5] A more persuasive view based on the theory of clinic-pathologic similarities among tumors originating in different sites is that these tumors arise from undifferentiated stem cells with multipotential differentiation toward a neuroendocrine and sometimes an exocrine differentiation such as squamous, glandular, or urothelial cell lineage when these incentive factors are present, and they tend to be of high grade.[1,6] The view of stem cells of origin can explain why the neuroendocrine and non-neuroendocrine components can be simultaneously observed in neuroendocrine carcinomas. For example, the neuroendocrine component of lung and gastrointestinal tract commonly appear in combination with squamous cell carcinoma or adenocarcinoma, the neuroendocrine component of renal pelvis is frequently accompanied with transitional cell carcinoma (TCC). However, the present case we reported showed squamous metaplasia component, which is extremely rare. Generally, TCC is the most common type in renal pelvis neoplasmas, whereas the type of squamous cell carcinoma or TCC with squamous metaplasia in renal pelvis is often accompanied with incentive factors such as pyelonephritis, kidney stones, and

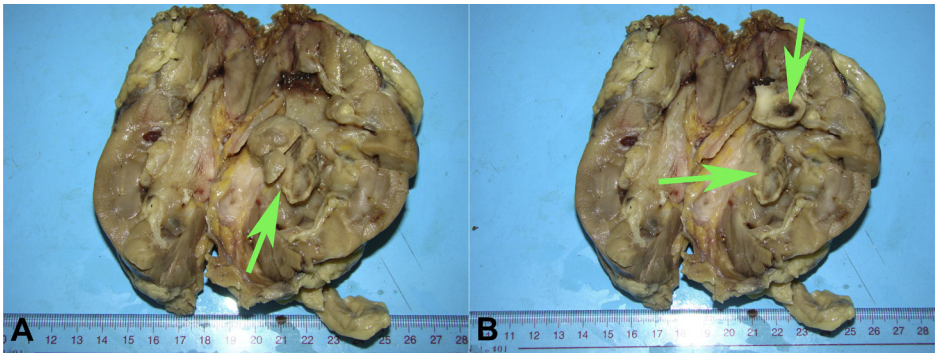

Figure 2. Macroscopically, the tumor predominantly located in the dilated renal pelvis, well-circumscribed, solid and nodular **(A)**. White-gray appearance with necrosis and hemorrhage presents on cut sections **(B)**.