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Case Report

A rare case of primary malignant small cell carcinoma in the ureter

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Abstract: Small cell carcinomas of the urinary tract are extremely rare, and few cases have been reported. Therefore, the clinical behavior of these tumors is poorly understood, and effective diagnostic methods and treatment modalities have not been established. We present a 72-year-old female who was admitted to the hospital complaining of left-side flank pain. An ill-defined, ovoid mass that originated from the ureter and caused complete obliteration of the left ureter was identified in the left pelvic cavity. Following an exploratory laparotomy and ureteral fistulation, we removed part of the tumor and left ureter for pathology analysis. However, the mass could not be resected completely because it had invaded the left bladder wall, left colon, upper rectum, and left uterine horn. Adjuvant chemotherapy was given after the pathologic diagnosis of primary small cell carcinoma of the distal ureter. After four cycles of combination chemotherapy, the patient died 5 months postoperatively due to severe pulmonary infection.

Keywords: Small cell carcinoma, ureter, urothelial cell carcinoma, chemotherapy

Introduction

Small cell carcinoma (SCC) occurs in the tracheobronchial tree. Extrapulmonary SCCs (EPSCCs) are rare neoplasms that have been reported in a variety of organs including the esophagus, stomach, pancreas, gallbladder, uterine cervix [1] and genitourinary organs. Genitourinary SCCs have been reported at many sites including the kidney [2], urinary bladder [3], urethra [4] and prostate [5]. SCC of the genitourinary tract is relatively common in the urinary bladder, but primary SCC of the ureter is rare [6]. Because of its rarity, the natural history of ureter SCC is poorly known. In general, however, the risk factors for urinary tract SCC are unknown, but it was hypothesized that bladder SCCs are usually found in smokers, patients affected by chronic cystitis, and those with bladder lithiasis [7]. However, the risks are unknown and there is no hypothesis for upper urinary tract SCCs due to a lack of data. In addition, most reported patients are of an Asian background, which could reflect an increased risk in this population due to genetic susceptibility or environmental factors [8]. We therefore report a case below.

Case presentation

A 75-year-old married female presented with complaints of severe left-side flank pain that had been present for 3 months. She did not complain of voiding symptoms such as hematuria, frequency, hesitancy, or dysuria. She had a smoking history of 0.5 pack (cigarettes, 20/pack) per day for 25 years, but denied having any respiratory symptoms. There was no family history of painless hematuria or urothelial malignancy. No remarkable findings were noted on physical examination except for a soft, nontender mass palpated in her left lower abdomen. Most laboratory tests yielded results within the normal limits. A magnetic resonance imaging (MRI) scan of the abdomen revealed a mass measuring ~7 × 8 cm in the left pelvic cavity, with severe left hydronephrosis (**Figure 1**). A chest computed tomography (**Figure 2**) was also reviewed, but no primary or metastatic lung lesions were observed. The patient underwent an exploratory laparotomy and ureteral

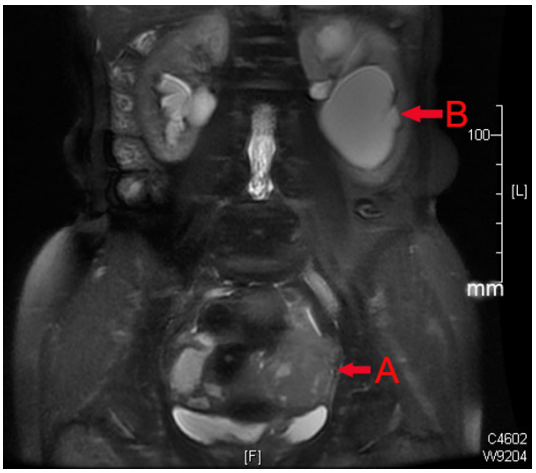

Figure 1. MRI scan revealing a mass measuring ~7 × 8 cm in the left pelvic cavity (A), with severe hydronephrosis (B). MRI, magnatic resonance imaging.

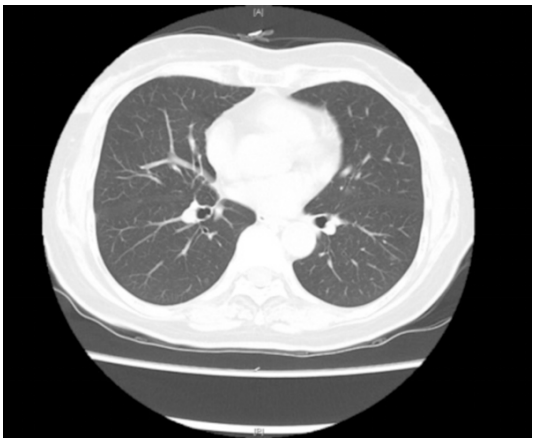

Figure 2. A chest computed tomography.

fistulation. Part of the tumor and left ureter were removed for pathologic analysis because the mass was large and had invaded the left bladder wall, left colon, upper rectum, and left uterine horn. Microscopic examination showed that the tumor was composed of small cells with a round to fusiform shape, scant cytoplasm, finely granular nuclear chromatin, and absent or inconspicuous nucleoli (**Figure 3A**). Immunohistochemical staining revealed that the tumor cells were positive for cluster of differentiation (CD)56 (**Figure 3B**), synaptophysin (Syn; **Figure 3C**), and Ki-67 (**Figure 3D**). The patient was diagnosed with SCC of the ureter. After surgery, five cycles of combination chemotherapy were scheduled, consisting of 80 mg/m^2 etoposide on days 1, 2, and 3 and 75 mg/m^2 cisplatin on day 1, every 3 weeks. However, the patient died after four cycles of chemotherapy (5 months postoperatively) due to severe pulmonary infection.

Discussion

Genitourinary SCC is relatively common in the urinary bladder, but primary SCC of the ureter is rare. The clinical features of primary urinary tract SCC are indistinguishable from those of renal clear cell carcinoma, with hematuria and flank pain the most commonly reported symptoms. Hematuria, usually gross, is due to vascular invasion, while pain is secondary to hydronephrosis following obstruction of the ureter [9]. When such symptoms appear, the tumor stage may already be advanced. Our patient presented with left-side flank pain and severe hydronephroureterosis, and exploratory laparotomy revealed the tumor was at an advanced stage. The results of a previous study suggested that excretory urography, ultrasonography, CT, and MRI were helpful in defining the extent and location of the tumor. The staging of urinary tract SCC is similar to that of lung small cell carcinoma [9, 10]. In our patient, it had already extended beyond one radiation port and was therefore classified as extensive disease.

Many treatments have been tried, but the optimal management of these tumors involves multimodality therapy including surgery, radiation therapy, and adjuvant chemotherapy to confer improved survival rates [11]. The present recommendation of the combination of a platinum-based chemotherapeutic agent and etoposide is the most frequently used regimen, which achieved a response rate of 69% in one study on the treatment of extrapulmonary SCC [12]. Some studies reported a better prognosis for patients treated with a chemotherapy regimen preoperatively [13, 14]. Nevertheless, for most patients with SCC of the ureter, these treatments are not sufficient to achieve a cure and other strategies are required to improve the outcome for patients with this lethal carcinoma [15]. For example, new molecular therapeutic approaches have been investigated for these carcinomas. In addition, it was reported that these kinds of tumor express c-kit and carry a platelet-derived growth factor receptor-α (PDGFRA) mutation, which may be potential therapeutic targets [15].

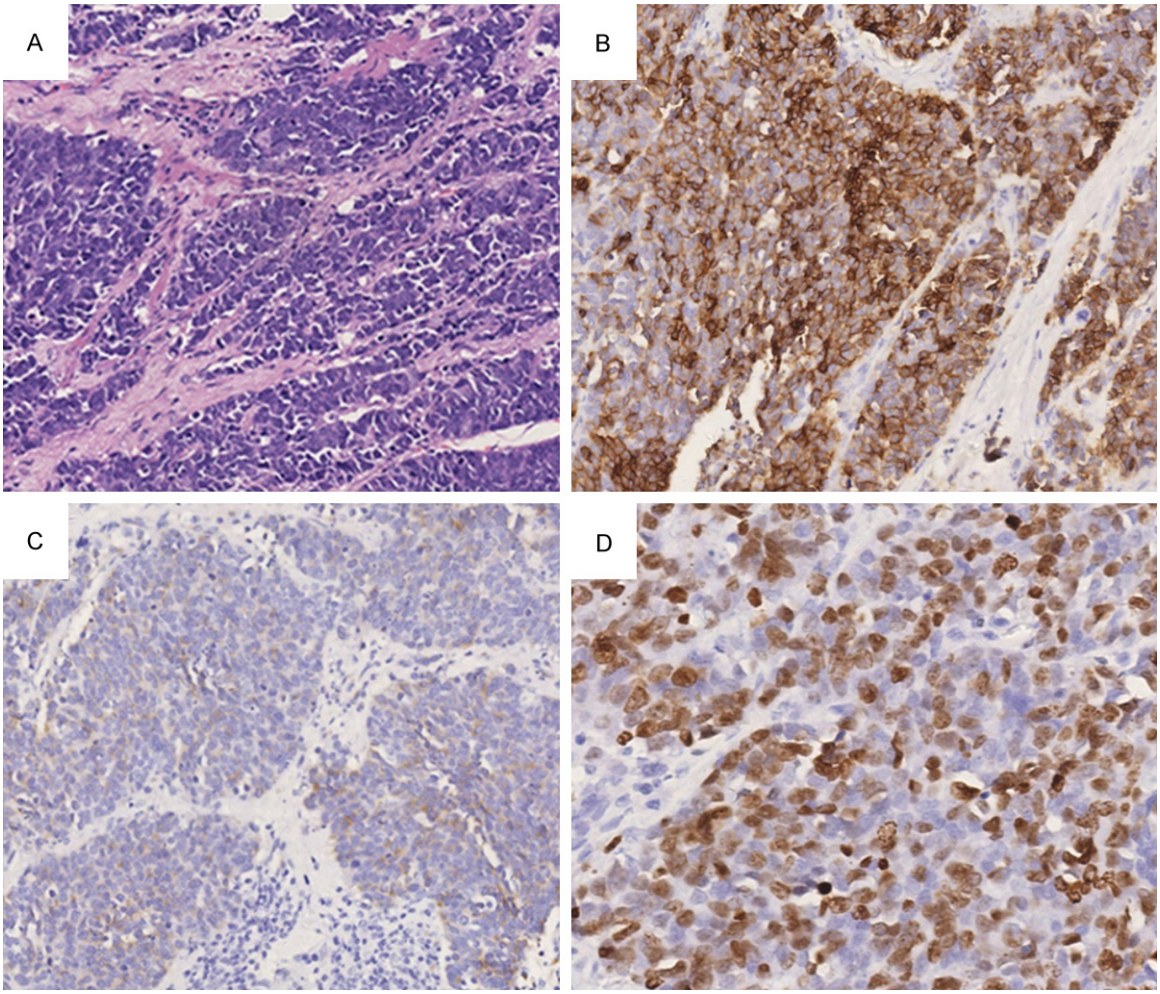

Figure 3. Microscopic examination confirming small cell carcinoma of the ureter on lightmicroscopywith H & E staining (A) (magnification, × 200). Immunohistochemical staining showing that tumor cells were positive for (B) cluster of differentiation 56 (CD56; magnification, × 200), (C) synaptophysin (Syn; magnification, × 200), (D) Ki-67 (magnification, × 400).

Conclusion

In summary, we report a unique case of SCC of the ureter. Surgical resection with adjuvant platinum-based chemotherapy was given but, unfortunately, the patient died 5 months after surgery due to severe pulmonary infection.

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Disclosure of conflict of interest

None.

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