



Oncology

Port Site Recurrence Following a Robotic Laparoscopic Radical Nephroureterectomy for Sarcomatoid Variant of Urothelial Carcinoma

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ABSTRACT

Port Site Recurrence (PSR) following laparoscopic tumor resections has been reported for a variety of tumors. Though PSR is a rare phenomenon, they most commonly occur following nephroureterectomies for upper tract urothelial carcinoma. Herein we report a novel case of a PSR following a robotic assisted nephroureterectomy for the sarcomatoid variant of urothelial carcinoma of the upper urinary tract.

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Introduction

Port site recurrence (PSR) is a rare complication of tumor resections described in the literature for both general surgery and urology.^{1,2} Results from an international survey of urology departments of tumor seeding following 10,912 laparoscopic procedures for cancer found an overall incidence of 0.1% for PSR.¹ In the survey, nephroureterectomy and adrenalectomies harbored the greatest risk of seeding, both with an incidence of 0.9%.¹ Additionally, of tumors involving the kidney, all reported cases had histology consistent with urothelial cell carcinomas.¹ In a single institutional study retrospectively reviewing 115 laparoscopic radical nephroureterectomies for urothelial carcinoma, the incidence of PSR was also found to be 0.9%.²

Despite the unique complication of PSR, the development of the laparoscopic radical nephroureterectomy (RNU) technique for the treatment of upper tract urothelial carcinoma, has decreased short-term morbidity,³ with equivalent long term efficacy, as compared to open RNU.³ Interestingly, there is a single case report of PSR following robotic-assisted laparoscopic urological procedures. In that case the patient underwent a robot-assisted laparoscopic cystectomy for lower tract urothelial carcinoma.⁴ Herein, we report

a novel case of PSR following a robotic assisted nephroureterectomy (RANU) with retroperitoneal lymph node dissection (RPLND) for sarcomatoid variant of urothelial carcinoma.

Case presentation

The patient initially presented as a 51-year-old male with no significant past medical history with multiple episodes of gross hematuria over the prior month. His family history was positive for a father with prostate cancer, but otherwise negative for genitourinary malignancies. A computed tomography urogram demonstrated a 4 × 3 × 3 cm mass in the upper pole of the right renal pelvis, with associated thickening of the proximal right ureter. A cystoscopy and chest X-ray performed at that time were both negative. The decision to proceed with extirpative surgery was made given the suspicious appearance of the mass and persistent symptoms of gross hematuria. The patient was subsequently scheduled for a minimally-invasive nephrectomy with possible conversion to RANU and RPLND.

Veress needle access was achieved through the umbilicus. Following insufflation, the needle was replaced with a visual obturator device. The peritoneal cavity was then inspected and found to be free of metastatic disease. Two 8 mm ports and three 12 mm ports were placed under direct vision. The posterior peritoneum was incised and the ureter and kidney were identified and then separated from the psoas muscle. The renal artery and vein were dissected and sequentially stapled using a vascular stapler device.

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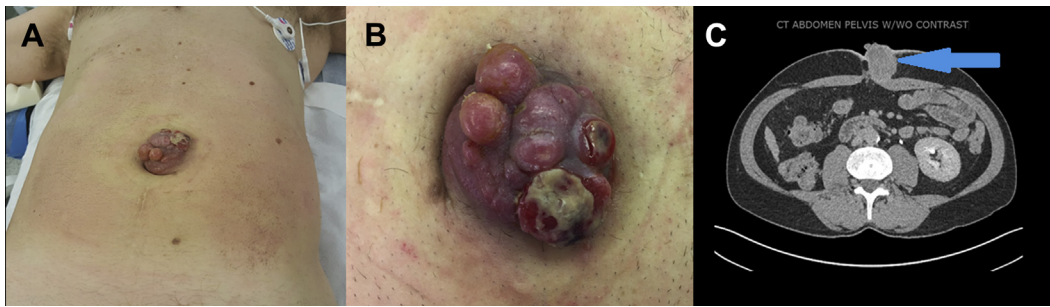


Figure 1. (A, B) 5 cm umbilical Port Site Recurrence. (C) CT scan of Port Site Recurrence with arrow pointing to tumor.

The lateral and upper pole attachments were ligasured. The ureter was then dissected to the level of the common iliac artery, clipped both proximally and distally, and divided. A lymph node dissection of the renal hilum and pericaaval tissues down to the bifurcation of common iliac artery was performed. The specimens including the kidney, proximal ureter, and nodes were inserted into an endocatch bag and extracted via a lower midline incision. Frozen pathology of the tumor was consistent with urothelial carcinoma. Therefore, the decision was made to resect the remaining portion of the right ureter including the bladder cuff. The robot was redocked and a gelpoint port was placed in the extraction incision, in order to reinsufflate the abdomen. The remaining resection, as well as the closing of the bladder defect, midline incision, and port sites were uncomplicated. The procedure had an estimated blood loss of 100 ml and a Foley catheter was left in place for 2 weeks.

Final pathological evaluation of the tumor revealed invasive high-grade urothelial carcinoma with sarcomatoid features, extending into

peripelvic soft tissue. The patient's right ureter and lymph nodes were negative for tumor, and the patient was staged as a pT3N0M0R0.

Over the next two years the patient developed multifocal urothelial carcinoma with multiple lesions in his bladder, treated initially with mitomycin and transurethral resection of bladder tumor. The patient progressed with metastatic spread to his retroperitoneal, pelvic and cervical lymph nodes, as well as to his lungs. He was started on five cycles of gemcitabine and cisplatin, however the tumors did not respond to therapy. He was enrolled in an immunotherapy clinical trial and randomized to the pembrolizumab without acalabrutinib (ACP-196) arm. He received 8 cycles of pembrolizumab, and was then crossed over to the pembrolizumab + ACP-196 arm. Unfortunately, around this time (roughly 2.5 years since initial presentation) the patient developed a protruding, bloody and painful, 5 cm umbilical PSR, which appeared to extend through the abdominal wall on CT imaging (Fig. 1). A palliative mass excision was performed using a wide

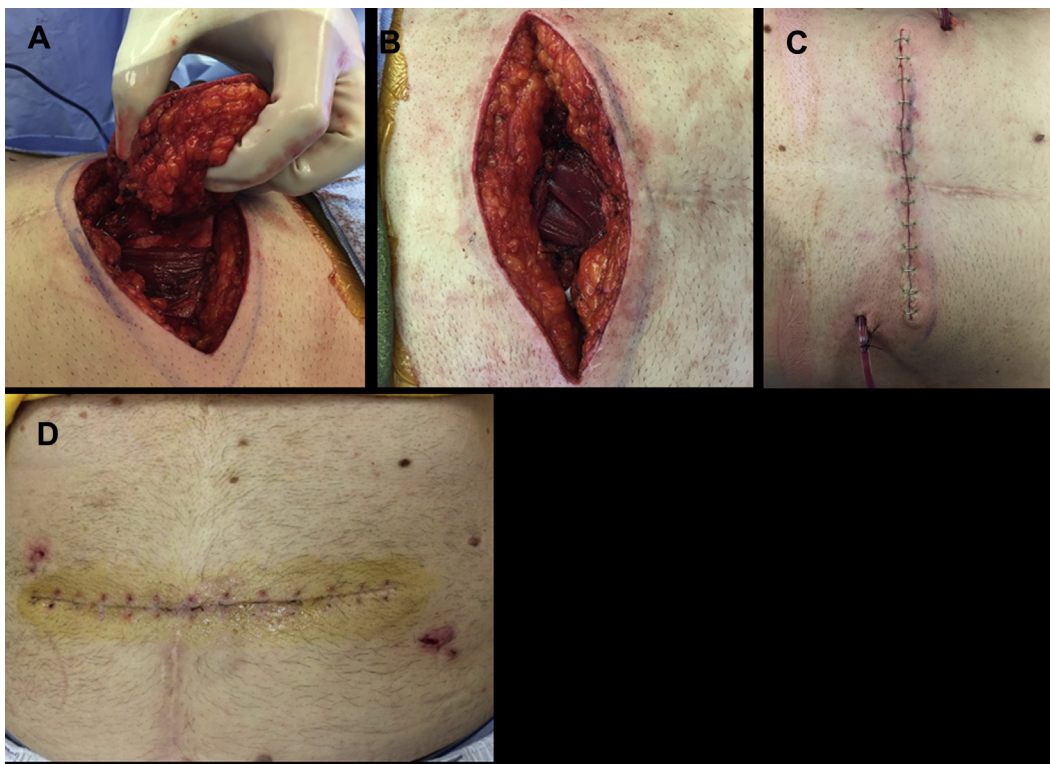


Figure 2. (A) Excision of tumor. (B) Reconstruction of fascia with SurgiMend. (C) Completed abdominoplasty. (D) Abdominal wall 2 weeks post-operatively.

circumferential elliptical incision. The tumor involved the anterior fascia, which was excised, and frozen pathological specimens of the tumor base were negative. Fascia was mobilized circumferentially and the excised fascia was reconstructed using SurgiMend to enable a tension free closure (Fig. 2). At the patient's 2-week post-operative visit, skin staples were removed and the incisions appeared well-healed (Fig. 2).

Discussion

There are a number of hypotheses for the occurrence of PSR following laparoscopic procedures. One hypothesis is that the usage of CO₂ to insufflate the abdomen creates a pressure gradient from the abdominal cavity, through the trocar sites, to room air, which propels tumor cells along the same path, allowing seeding of the trocar sites. Other procedure specific risk factors include tumor violation, such as by tumor morcellation or via trauma following stent placement.²

In this case report the patient had no known tumor violations prior to or during the procedure and an effort was made to perform the RANU with sound oncological principles minimizing handling of the tumor, excising the remainder of the ureter down to the bladder cuff, and using an endocatch bag to remove the specimen. Additionally, the patient was treated with adjuvant chemotherapy. Because the patient's tumor continued to progress, he was enrolled in a platinum-resistant immunotherapy clinical trial for urothelial carcinoma. He was first randomized to receive Pembrolizumab, which functions by blocking the PD-1 receptor pathologically expressed by tumor cells to evade immune surveillance. He was then crossed over to Pembrolizumab plus ACP-196, the latter of which inhibits bruton tyrosine kinase (BTK), causing an increase in cytotoxic T-Cell differentiation. Despite these treatments the patient had multiple local and distant recurrences as well as a PSR.

Of note, this patient was found to have the sarcomatoid variant of urothelial carcinoma. The sarcomatoid variant is relatively rare, but is noteworthy for its aggressiveness.⁵ In a Surveillance, Epidemiology, and End Results cohort, the incidence of the sarcomatoid variant in bladder cancer was 0.09%, but it carried a worse prognosis than the more common high-grade urothelial carcinomas of the bladder.⁵ Due to the rarity of PSR, the incidence for different tumors based on histopathology is largely unknown. However, in the aforementioned international survey of PSR following laparoscopic urological surgeries for cancer, seven out of nine events were in patients with transitional cell carcinoma and none were from Renal Cell Carcinoma.¹ Therefore, it is worth noting that urothelial carcinoma in general, but specifically the sarcomatoid variant, may harbor an increased risk of PSR, and special precaution should be taken to minimize potential causes of tumor seeding.

Conflicts of interest

None.

References

1. Micali S, Celia A, Bove P, et al. Tumor seeding in urological laparoscopy: An international survey. *J Urol.* 2004;171:2151–2154.
2. Muntener M, Schaeffer EM, Romero FR, et al. Incidence of local recurrence and port site metastasis after laparoscopic radical nephroureterectomy. *Urology.* 2007;70:864–868.
3. Shalhav AL, Dunn MD, Portis AJ, et al. Laparoscopic nephroureterectomy for upper tract transitional cell cancer: The Washington University experience. *J Urol.* 2000;163:1100–1104.
4. El-Tabey NA, Shoma AM. Port site metastases after robot-assisted laparoscopic radical cystectomy. *Urology.* 2005;66:1110.e1–1110.e3.
5. Wright JL, Black PC, Brown GA, et al. Differences in survival among patients with sarcomatoid carcinoma, carcinosarcoma and urothelial carcinoma of the bladder. *J Urol.* 2007;178:2302–2307.