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Successful surgical management of recurrent urachal adenocarcinoma: A case report

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A B S T R A C T

Urachal carcinoma is a rare neoplasm for which there is a lack of a standard effective chemotherapeutic treatment. There is also no standard treatment available for recurrent metastatic urachal carcinoma and the prognosis is generally poor. We report a case of urachal carcinoma where the patient achieved long-term disease-free survival after repeated surgeries for recurrent lung metastases.

Introduction

Urachal carcinoma is a rare form of bladder cancer. It accounts for only 0.35–0.7% of all bladder malignancies.[1] At present, there is no standard chemotherapy regimen and surgical removal is the treatment of choice. Recurrent or metastatic urachal cancer has a very poor prognosis. Hereby, we report the case of a 48-year-old man with urachal carcinoma who achieved long-term disease-free survival following excision of the urachal tumor followed by repeated surgeries for recurrent lung lesions.

Case presentation

A 48-year-old male patient presented with macroscopic hematuria. His past medical history was not significant except for a right orchiectomy at the age of five, which eventually revealed a benign testicular tumor. Cystoscopy revealed a 3-cm broad-based non-papillary mass on the dome of the urinary bladder. Computed tomography (CT) and 2-deoxy-2-[18F]fluoro-D-glucose positron emission tomography (18F-FDG-PET) scans showed that the tumor extended to the median umbilical ligament but had not spread to the peritoneum nor disseminated to regional lymph nodes or distant organs (Fig. 1A and B). Blood tests were normal except for an elevated serum CA19-9 level of 73.2 U/mL (upper normal value, 37.0 U/mL).

A transurethral resection (TUR) biopsy was performed. Microscopically, the tumor consisted of intestinal epithelium-like high columnar atypical cells with a cribriform growth pattern infiltrating to the muscular layer (Fig. 1C and D), which led to a pathological diagnosis of moderately differentiated, enteric type urachal adenocarcinoma. This was consistent with positive immunohistochemical staining for CDX2 (Fig. 1E) and CK7 (Fig. 1F).

Open partial cystectomy with *en bloc* resection of the urachus, umbilicus and bladder dome and pelvic lymph node dissection was performed. On pathological examination, the 21-mm tumor showed histological findings similar to those of the TUR specimen. In terms of extent of tumor invasion, perineural and microvascular invasion were observed but no lymphatic and peritoneal invasion were found. Surgical margins were free from tumor infiltration and no involvement was observed in any of the 30 resected lymph nodes. The final diagnosis was urachal adenocarcinoma, Sheldon stage IIIA.

Postoperative recovery was uneventful and serum CA19-9 decreased to 20.6 U/mL (Fig. 2A). Thirteen months after surgery, however, a single metastasis to the upper lobe of the right lung was detected by CT (Fig. 2B) and 18F-FDG-PET (Fig. 2C). Serum CA19-9 was 24.6 U/mL. Video-assisted thoracoscopic surgery (VATS) segmentectomy of the lung was performed. Histopathological examination showed an adenocarcinoma that was morphologically similar to the original tumor with tumor-free surgical margins. Postoperative serum CA19-9 was 20.6 U/mL. The patient received eight cycles of adjuvant chemotherapy with capecitabine plus oxaliplatin (XELOX). Considering that it was an adjuvant setting, we preferred XELOX to FOLFOX (fluorouracil, calcium folinate, and oxaliplatin), which requires an additional intravenous port

Abbreviations: CT, Computed tomography; 18F-FDG-PET, 18F-2-deoxy-2-[18F]fluoro-D-glucose-positron emission tomography; TUR, transurethral resection; VATS, video-assisted thoracoscopic surgery.

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for continuous injection.

Seventeen months postoperatively (eight months after completion of adjuvant XELOX), an enlarged nodule in the upper lobe of the left lung was discovered by CT scan (Fig. 2D). No other lesions were detected by 18F-FDG-PET (Fig. 2E) and serum CA19-9 was 29.9 U/mL. Another VATS segmentectomy was performed and subsequent pathological examination again revealed metastasis of the urachal adenocarcinoma with tumor-free surgical margins. Postoperative serum CA19-9 was 18.9 U/mL. The patient has experienced good health without any additional treatment since the second metastasectomy and has remained tumor free for almost five years.

Discussion

The 5-year overall survival rate for patients with metastatic urachal carcinoma was reported to be less than 20%.[1] Currently, established guidelines for the treatment of recurrent of metastatic urachal carcinoma do not exist. However, recommendations for treatment of recurrent or metastatic colorectal cancer, which shares similar pathology[1] and genetics[2] with urachal adenocarcinoma, include the surgical removal of recurrent or metastatic lesions whenever feasible.

There are only a few documented cases where patients with metastatic urachal adenocarcinoma achieved long-term disease-free survival after surgical removal of recurrent or metastatic lesions (Table 1). Unlike urothelial carcinoma, the addition of chemotherapeutic treatments to surgical removal does not provide a clear benefit to patients with urachal carcinoma. Complete resection of solitary lesions, however, is observed in all disease-free patients.

Previously the importance of complete resection of the primary lesion for positive oncological outcomes after surgery have been reported.[3,4] Ashley et al.[3] showed that a negative surgical margin was an independent predictor for longer postoperative survival, as was the pathological grade of the tumor. Bruins et al.[4] identified macroscopically complete resection and the pathological grade as independent

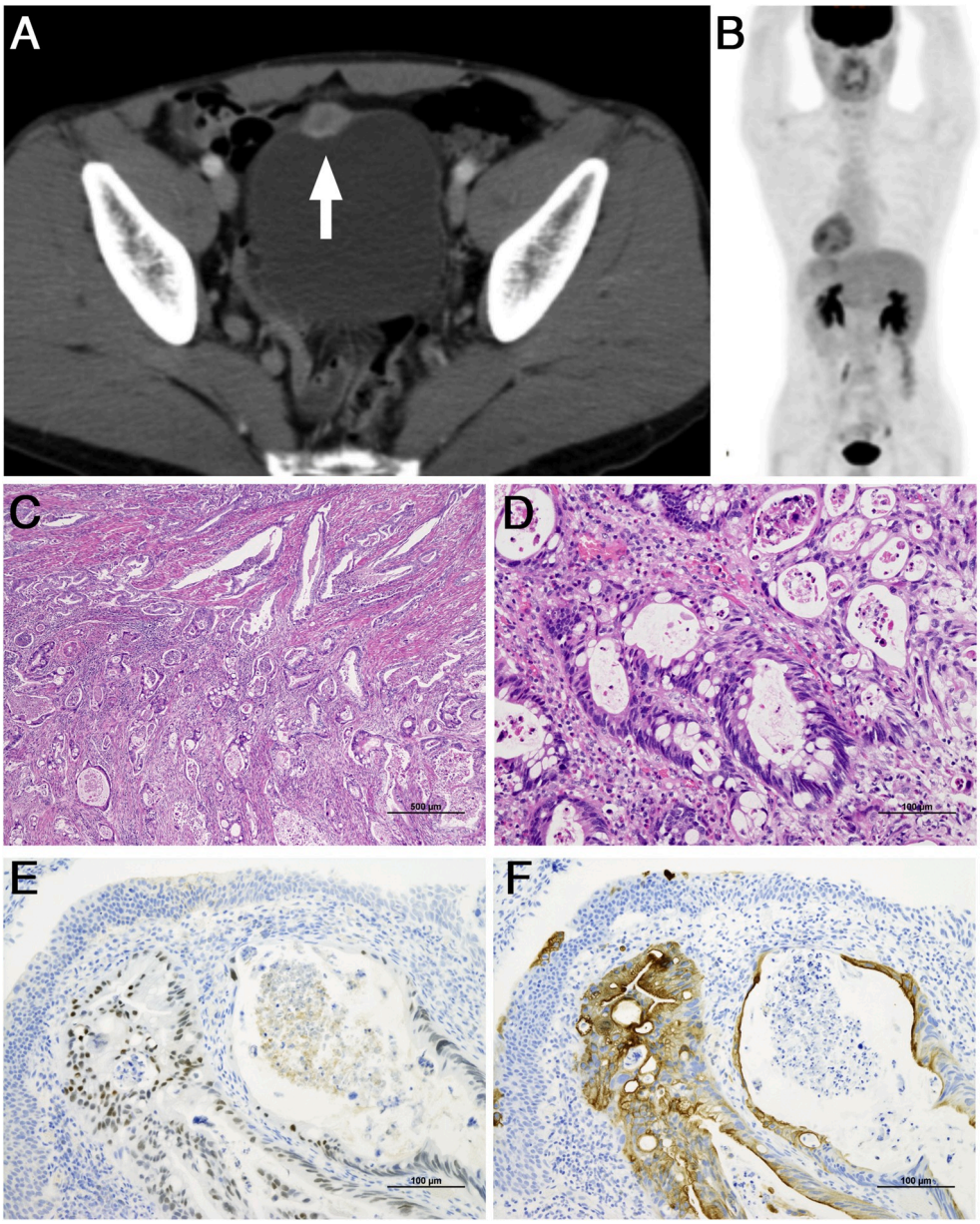

Fig. 1. A. Pretreatment contrast-enhanced computed tomography (CT) showing a 3-cm mass (arrow) on the anterior wall of the urinary bladder. **B**. Whole body 18F-FDG-PET showing no abnormal uptake. **C–F.** Representative photomicrograph of transurethral resection (TUR) specimen with hematoxylin and eosin stain (**C** and **D**) and immunohistochemical stains for anti-CDX2 (**E**) and anti-CK7 (**F**) antibodies. Bars indicate 500 µm (**C**) and 100 µm (**D–F**).

prognostic factors for postoperative survival.

Taken together, complete resection and lower pathological grade seem to be key factors for the successful surgical management of primary urachal adenocarcinoma. It is assumed that those principles can be applied to metastasectomy as well. The patient in the present case developed small, solitary pulmonary lesions metachronously, which allowed for complete surgical removal. Additionally, these lesions were not pathologically high grade. Therefore, the authors believe that this patient has an excellent tumor-free prognosis.

In the present case, based on the genetic similarity of urachal and colorectal adenocarcinoma, this patient received adjuvant chemotherapy with capecitabine plus oxaliplatin (XELOX) regimen after the first metastasectomy. This did not prevent the development of a second metastasis identified only 8 months after completion of the XELOX therapy. Therefore, no adjuvant chemotherapy was given after the second metastasectomy, which yielded long-term disease-free survival. The role of perioperative systemic chemotherapy in surgeries for primary or metastatic lesions of urachal carcinoma is unclear. No large-scale clinical trials of chemotherapy in combination with surgical treatment for urachal carcinomas have been reported. Among the very limited literature describing effective chemotherapy for urachal adenocarcinoma, a meta-analysis by Szarvas et al.[5] pointed to the potential efficacy of 5-fluorouracil combined with cisplatin, which produced a radiographic response rate of approximately 40%.

Conclusion

We report the case of a man with urachal adenocarcinoma and recurrent pulmonary metastases who achieved long-term disease-free survival after two successful metastasectomies. Surgical removal of

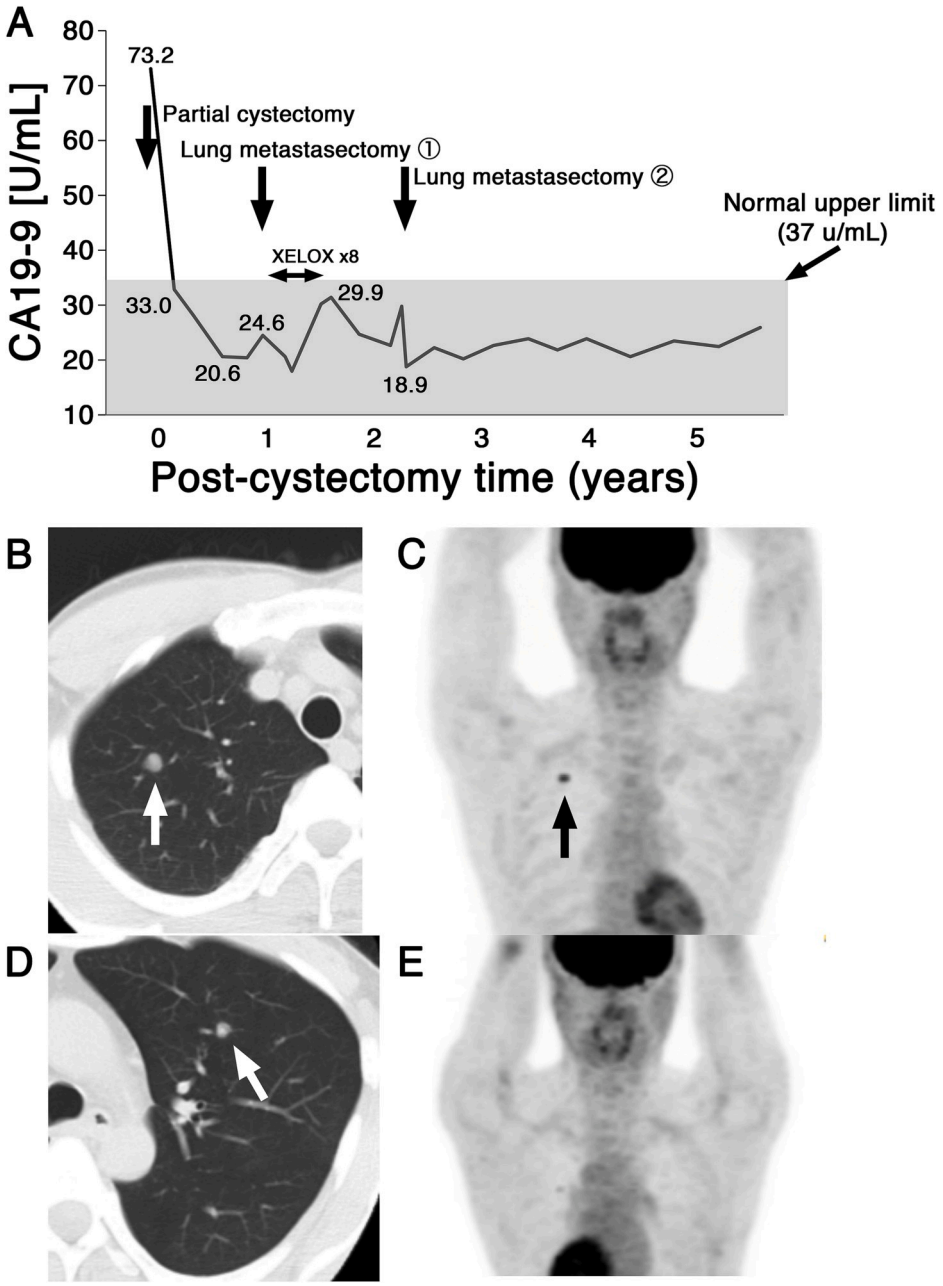

Fig. 2. **A**. Clinical course of the present case with regard to serum CA19-9 levels. **B, C**. CT scan (**B**) and whole body 18F-FDG-PET (**C**) showing a solitary metastatic lesion on the right lung (arrows), which was resected by lung metastasectomy 1 shown in (**A**). **D.** CT scan showing a solitary metastatic lesion on the right lung (arrows), which was resected by lung metastasectomy 2 shown in (**A**). **E.** The lesion was not identified by whole body 18F-FDG-PET.

Table 1
Reports on successful surgical resection of recurrent urachal adenocarcinoma..

Author (Year) [PMID]	Age (years), sex	Site of metastasis	Time to recurrence*	Pathological grade (Differentiation)	Surgical margin	Perioperative chemotherapy (Number of cycles)	Outcomes
Kajita 1 (2000) [11215196]	30, male	Local, peritoneal wall	7 years	N.S.	N.S.	None	Recurrence, 8 years
		Local	8 years	N.S.	N.S.	None	Disease free, 9 years
Kajita 2 (2000) [11215196]	54, female	Local	2 years	N.S.	N.S.	None	Recurrence, 1 year
		Local	1 year	N.S.	N.S.	None	Disease free, 14 years
Kawakami (2001) [11549502]	30, female	Lung, Ovary	9 months	Well	Negative	Adjuvant 5-FU + Dox + VP16 (2)	Recurrence, 11 months
		Local	11 months	Well to moderate	Negative	None	Recurrence, 15 months
		Lung	15 months	Well to moderate	Negative	Neoadjuvant and adjuvant 5-FU + CDDP + IFNα (total 3)	Disease free, 8 years
Hasegawa (2005) [15852675]	34, female	Lung	2 months	Well	Negative	Neoadjuvant Pac + CBDCA (3)	Disease free, 14 months
Yang (2015) [25337842]	53, male	Skin	5 years	N.S.	Negative	None	Disease free, 7 months
Present case	48, male	Lung	13 months	Moderate	Negative	Adjuvant XELOX (6)	Recurrence, 17 months
		Lung	17 months	Moderate	Negative	None	Disease free, 3 years

*Time from the previous surgery

N.S., not stated; 5-FU, 5-fluorouracil; Dox, doxorubicin; VP-16, etoposide; CDDP, cisplatin; IFNα, interferon α; Pac, paclitaxel; CBDCA, carboplatin; XELOX, capecitabine plus oxaliplatin

metastatic lesions may be considered a beneficial treatment option if complete resection is expected.

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Conflict of interest and disclosure statement

The authors of this manuscript have no conflicts of interest or competing interests to report.

Declaration of competing interest

None.

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