Successful surgical management of recurrent urachal adenocarcinoma: A case report

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Abstract

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. 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 umbilicus and bladder dome (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.

References

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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%. 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 and genetics 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. Ashley et al. 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. identified macroscopically complete resection and the pathological grade as independent predictors of survival.
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 capcitabine 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. 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.](image)
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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References
1. Mylonas KS, OM P, Ziegas IA, El-Kabab L, Nasioudis D. Malignant urachal neoplasms: a population-based study and systematic review of literature. Urol Oncol. 2017;35:33 e11–33 e19.
2. Collazo-Lorduy A, Castillo-Martin M, Wang L, et al. Urachal carcinoma shares genomic alterations with colorectal carcinoma and may respond to epidermal growth factor inhibition. Eur Urol. 2016;70:771–775.
3. Ashley RA, Inman BA, Sebo TJ, et al. Urachal carcinoma: clinicopathologic features and long-term outcomes of an aggressive malignancy. Cancer. 2006;107:712–720.
4. Bruins HM, Visser O, Ploeg M, Hulsbergen-van de Kaa CA, Kiemeney LA, Witjes JA. The clinical epidemiology of urachal carcinoma: results of a large, population based study. J Urol. 2012;188:1102–1107.
5. Szarvas T, Modos O, Niedworok C, et al. Clinical, prognostic, and therapeutic aspects of urachal carcinoma-A comprehensive review with meta-analysis of 1,010 cases. Urol Oncol. 2016;34:388–398.

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 |
| Kajita 2 (2000) [11215196] | 54, female | Local | 2 years | N.S. | N.S. | None | Recurrence, 1 year |
| Kawakami (2001) [11549502] | 30, female | Lung, Ovary | 9 months | Well | Negative | Adjuvant 5-FU + Dox + VP16 (2) | Recurrence, 11 months |
| Hasegawa (2005) [15852675] | 34, female | Lung | 2 months | Well | Negative | Neoadjuvant and adjuvant 5-FU + CDDP + IFNα (total 5) | Disease free, 8 years |
| 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 |
| Present case | 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.