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Laparoscopic partial cystectomy and urachal excision with one-year follow-up for urachal adenocarcinoma: A detailed case report

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Abstract

We present a case of a 51-year-old male with urachal adenocarcinoma, a rare bladder cancer. Initial symptoms included gross hematuria. CT and MRI identified a 3.5 x 2.4 x 2.1 cm mass at the bladder dome. The patient underwent laparoscopic partial cystectomy and urachal excision. Histopathology confirmed a well-differentiated mucin-producing adenocarcinoma. Follow-ups at 3, 6, and 12 months showed no recurrence, and the patient remained asymptomatic. This case underscores the importance of early, aggressive surgical management and highlights the need for a multidisciplinary approach to improve patient outcomes.

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Introduction

Urachal adenocarcinoma is a rare and aggressive cancer that originates in the urachus, a vestigial remnant of the allantois and part of the umbilical cord during fetal development. This small fibrous structure extends from the bladder's apex to the umbilicus and typically obliterates after birth, forming a fibrous band known as the median umbilical ligament. In some individuals, however, parts of the urachus fail to regress completely, which can lead to pathological conditions, including cancer, in adulthood [1,2].

Case presentation

A 51-year-old male sought medical attention at a urology clinic after experiencing gross hematuria. Diagnostic imaging, including ultrasound and computed tomography scans of the abdomen and pelvis, revealed a 3.5 cm mass within the urinary bladder, prompting concerns of a bladder tumor. Further evaluation indicated a lobulated soft tissue density lesion positioned at the dome of the bladder, extending into the lumen and displaying heterogeneous enhancement with arterial phase enhancement post-contrast administration. Importantly, there was no evidence of invasion into adjacent abdominal wall muscles (Appendix A).

The patient underwent a Positron Emission Tomography (PET) scan, cystoscopy, and transurethral partial resection of the mass. Histopathological examination of the excised tissue confirmed the presence of well-differentiated mucin-producing adenocarcinoma, consistent with urachal adenocarcinoma of

intestinal (or enteric) type, graded as Grade 1 (Appendix B).

Given the diagnosis, a Multidisciplinary Team (MDT) recommended a laparoscopic or robotic partial cystectomy along with urachal excision. The patient was also referred to gastroenterology to rule out intestinal malignancy. Subsequent colonoscopy results came back negative for malignancy.

Laparoscopic partial cystectomy was carried out. The surgical procedure involved creating small incisions and trocar insertions to access the abdominal cavity. An inverted V-shaped incision was made to separate the urachal remnant from the abdominal wall, with careful attention to avoid injury to surrounding structures. A partial cystectomy ensued, ensuring a 1-2 cm margin from the mass infiltrating the bladder mucosa. The excised mass, along with a portion of the normal bladder wall, was sent for histopathological examination, confirming negative margins.

Post-surgery, the patient underwent regular follow-up appointments, including cystoscopies and CT scans. These assessments revealed no evidence of tumor recurrence or abnormalities in the bladder. About one year after the operation, the patient remains free of recurrence, metastasis, or complications, highlighting the success of the surgical intervention and ongoing surveillance.

Discussion

Urachal adenocarcinoma typically presents with nonspecific symptoms such as hematuria, abdominal pain, or a palpable abdominal mass, leading to challenges in early diagnosis due to the similarity of symptoms to other conditions. Advanced imaging techniques, like CT and MRI, are crucial in determining the tumor's location and extent, especially around the bladder dome extending toward the umbilicus. Histological examination following biopsy is critical for its differentiation from metastatic cancers, with features resembling colorectal adenocarcinomas [3,4].

Both CT scans and MRIs play a pivotal role in the accurate staging and diagnosis of urachal adenocarcinoma. These imaging methods assess the extent of the tumor and its invasion into adjacent structures, crucial for planning the surgical approach. The precise tumor location along the urachus affects both surgical methods and prognosis, with high-resolution imaging ensuring adequate resection margins [5,6].

Surgery is the primary treatment modality for urachal adenocarcinoma, aiming to completely remove the tumor and any involved structures to achieve clear margins. The typical surgical approaches range from partial cystectomy to radical cystectomy, often involving the excision of the urachus and the umbilicus. For advanced stages, chemotherapy regimens are similar to those used for colorectal cancers, such as FOLFIRI (5-fluorouracil, leucovorin, and irinotecan) [7]. Radiation therapy is employed for palliative care or in cases with positive surgical margins [8].

Prognostic factors crucially include the stage at diagnosis, lymph node involvement, and metastatic presence. High expression of proliferation markers like Ki-67 and mutations in genes such as p53 are associated with poorer outcomes [9]. Early-stage disease can have a favorable prognosis with proper surgical management, whereas advanced disease presents a more challenging outlook.

The literature, rich with case studies, underscores the variations in clinical presentation, treatment responses, and outcomes, providing invaluable insights. There is a pressing need for more comprehensive studies and international registries to develop standardized treatment protocols. Collaborative efforts are vital for improving diagnosis, customizing treatment approaches, and enhancing overall prognosis [10,11].

Conclusion

Urachal adenocarcinoma, though rare, necessitates a comprehensive, multidisciplinary approach to treatment due to its complexity. The growing body of literature, mainly from case reports and small series, emphasizes the importance of understanding its molecular biology to explore potential genetic drivers and develop targeted therapies that could significantly improve treatment outcomes for this challenging cancer. Continued documentation and research are crucial for advancing treatment strategies. In this case study, we present a 51-year-old male patient who was diagnosed early and managed with an early surgical approach, maintaining remission and negative findings during follow-up cystoscopies 12 months post-operatively.

Appendix A

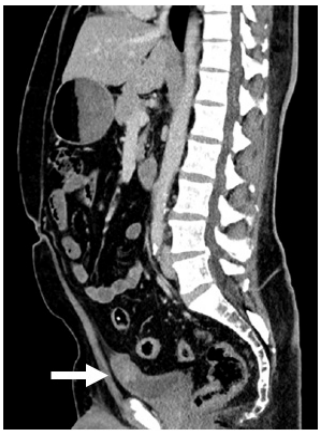

Figure 1: Computed tomography with contrast, sagittal reconstruction showing urachal remnant and expansile lesion that is irregular on the midline of the meso hypogastrium region, with heterogeneous contrast enhancement (arrow).

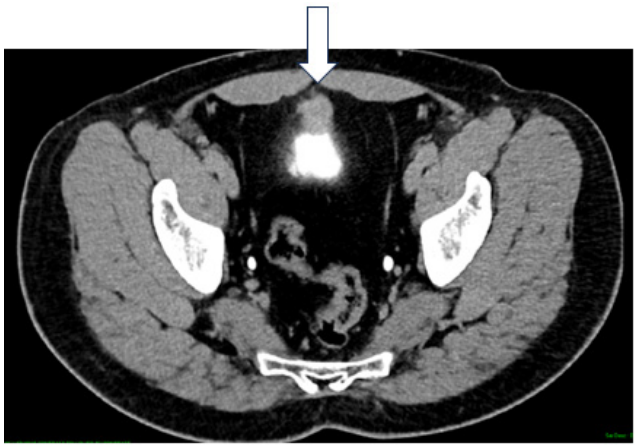

Figure 2: Computed tomography, axial section showing urachal remnant and a mass with heterogeneous contrast enhancement in the meso hypogastrium region at the anterosuperior midline for the apex of the bladder (arrow).

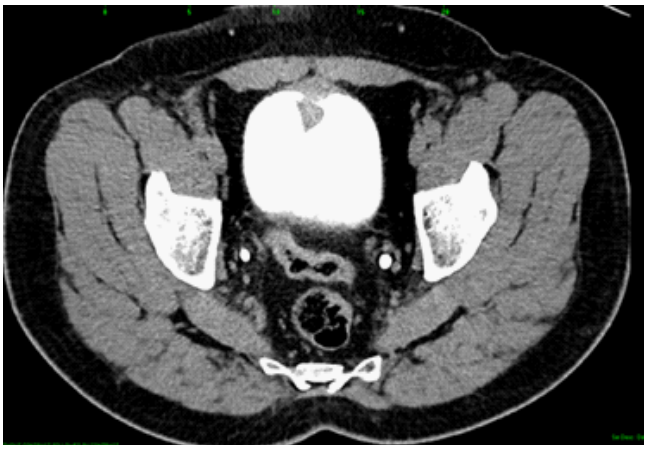

Figure 3: Computed tomography, axial section showing urachal remnant and a clear view of the extension of the mass invading the urinary bladder in the meso hypogastrium region.

Appendix B:

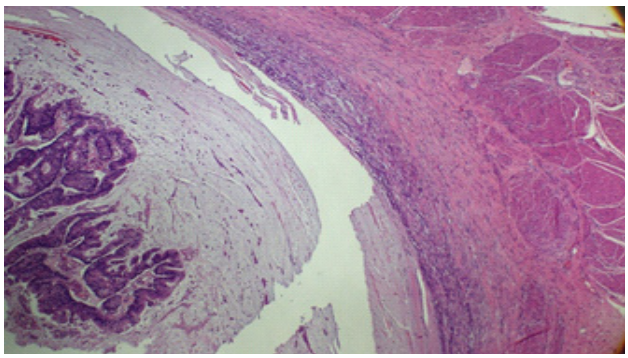

Figure A: Dysplastic intestinal type glands seen in abundant mucin in the deep muscular layer (Hematoxylin and eosin stain, scanner view 4x).

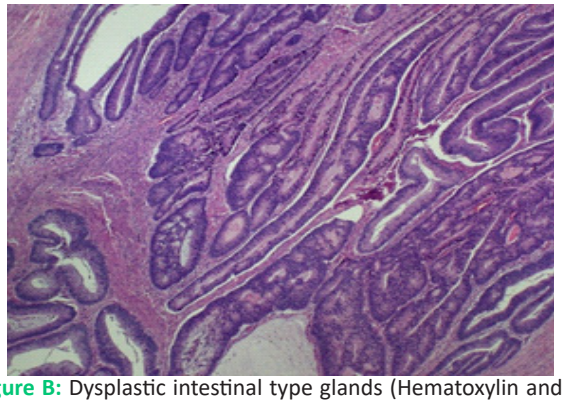

Figure B: Dysplastic intestinal type glands (Hematoxylin and eosin stain, low power view 10x).

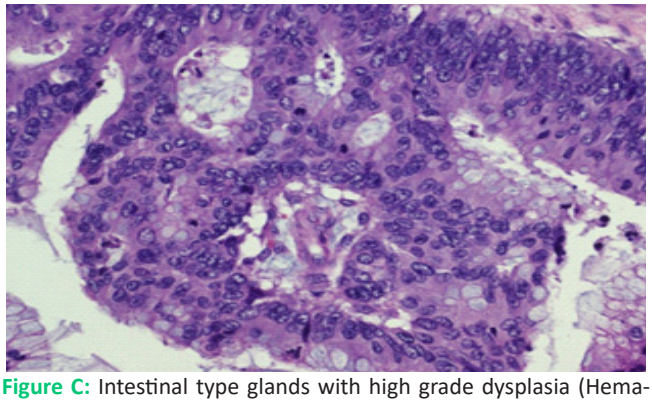

Figure C: Intestinal type glands with high grade dysplasia (Hematoxylin and eosin stain, high power view 40x).

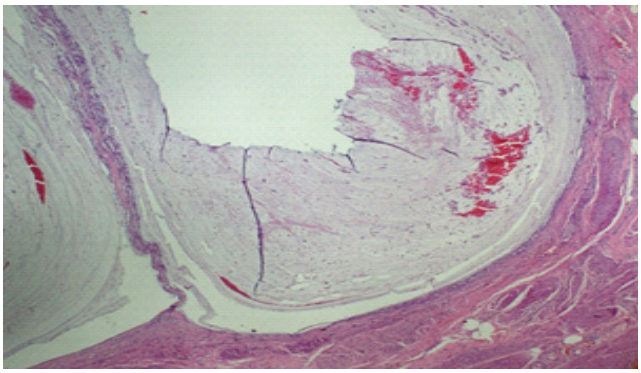

Figure D: Mucin pool seen in the deep muscular layer (Hematoxylin and eosin stain, scanner view 4x).

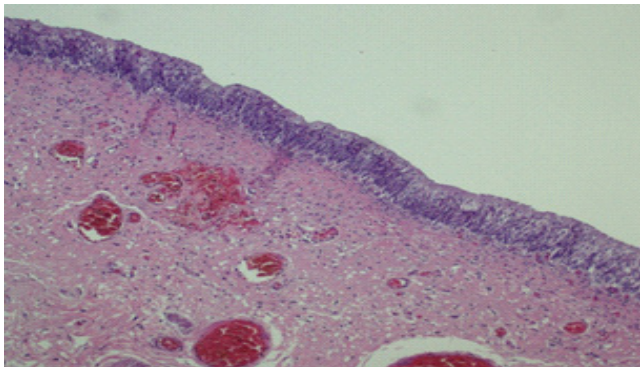

Figure E: Normal overlying urothelium (Hematoxylin and eosin stain, scanner view 4x).

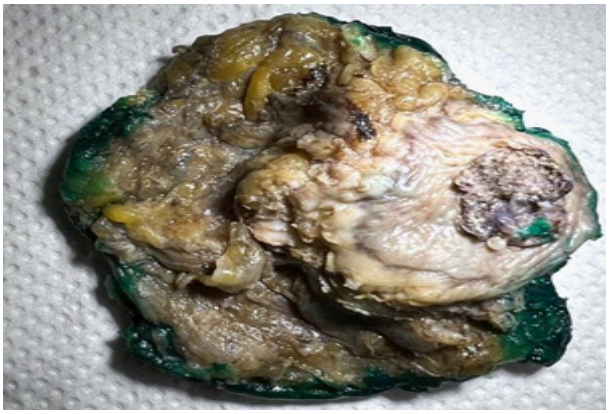

Figure F: Gross picture of the excised urachus with the tumor.

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