

## CASE REPORT

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# Single lung metastasis of urothelial carcinoma can be cured by surgical resection with long-term survival

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## ABSTRACT

**Introduction:** Metastatic urothelial carcinoma is unlikely to be cured.

**Case Report:** We present a case of urothelial carcinoma (UC) with lung metastasis which was cured after resection. A 57-year-old male who was found to have a mass in the right renal pelvis involving the right ureter and urinary bladder. Biopsies from the renal mass and the bladder showed papillary UC with no invasion to the lamina propria (pTa). He underwent a right radical nephroureterectomy, pelvic lymphadenectomy, and cystoprostatectomy with ileal loop conduit urinary diversion. A growing metastatic mass in the upper lobe of the left lung was found five years later. It was resected. On follow-up, he has no evidence of metastasis four years after surgery.

**Conclusion:** Pulmonary metastasis from urothelial origin can have cavitory appearance on computed tomography (CT) and can happen after more than five years of primary tumor resection. Long-term follow-up is necessary for detection of late metastasis that can be resected if solitary pulmonary with possible long-term survival.

**Keywords:** Lung metastasis, Malignancy, Tumor, Urothelial carcinoma

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## INTRODUCTION

Urothelial carcinoma (UC) of the upper urinary tract is uncommon and accounts for only 5–10% of UCs, and can present with concurrent bladder cancer in 17% of cases [1]. Patients with upper tract urothelial carcinoma (UTUC) and bladder cancer usually present with painless hematuria. The diagnosis is often delayed, as the symptoms are similar to various other benign conditions such as urinary tract infection, prostatitis, or calculi. Optimal surgical management for low-risk UTUC is nephron sparing surgery as possible in contrast to radical nephroureterectomy for high-risk disease. Distant metastases of UTUC are liver, lung, mediastinum, and bones [2]. However, there have been few cases of late pulmonary metastasis of upper urinary tract urothelial carcinoma [3]. We describe a patient who was found to have late onset pulmonary metastasis of urothelial origin five years after surgery. Pulmonary metastasis was detected as multiple thin-walled cystic lesions on follow-up CT, which is an uncommon radiological manifestation of such metastases [4, 5]. The patient is alive and well 4 years after metastasectomy, a finding that shows possibility of cure with long-term survival after surgical resection of late solitary pulmonary metastases of UC origin [6].

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## CASE REPORT

A 57-year-old male was presented with gross hematuria. He was a smoker. In CT imaging, he was found to have a mass in the right renal pelvis with other lesions involving the right ureter with hydronephrosis and multiple large lesions in the urinary bladder (Figure 1A–C). Cystoscopy showed extensive papillary growth covering most of the bladder surfaces that was partially resected, being beyond adequate complete resection. Histopathology showed UC in the right renal pelvis and bladder (non-invasive papillary UC). There was no evidence of distant metastasis initially. A bladder biopsy showed a high grade papillary UC with no invasion to the lamina propria (pTa). The patient underwent right radical nephroureterectomy, cystoprostatectomy, paracaval lymphadenectomy, bilateral pelvic lymph node dissection extending to common iliacs, and ileal loop conduit urinary diversion. The histopathological examination of the specimen revealed low-grade papillary UC involving the renal pelvis, the right ureter, and bladder (pTa, pNo) with all lymph nodes were negative for malignancy. On follow-up CT scans of the chest, abdomen, and pelvis he had no recurrence or metastasis until five years later, when he was found to have a growing mass in the upper lobe of the left lung with no abdominal metastases and no evidence of contralateral metachronous UTUC. The lung mass was irregular in shape and its maximum diameter reached 3 cm with central bubble and cavitation (Figure 2). The provisional diagnosis was lung adenocarcinoma.

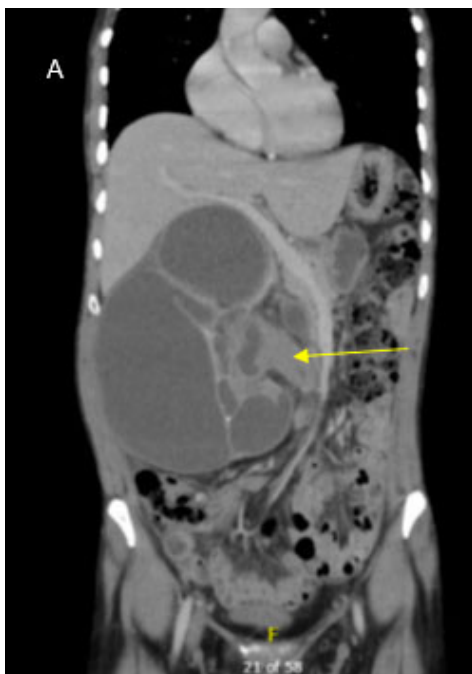


Figure 1: Pre-operative images: (A) Enhanced CT coronal section showing severe right hydronephrosis with soft tissue mass in the renal pelvis and upper ureter. (B) Enhanced CT axial section showing urinary bladder mass with calcification. (C) CT axial section in delayed phase showing thickening of bladder wall with filling defect.

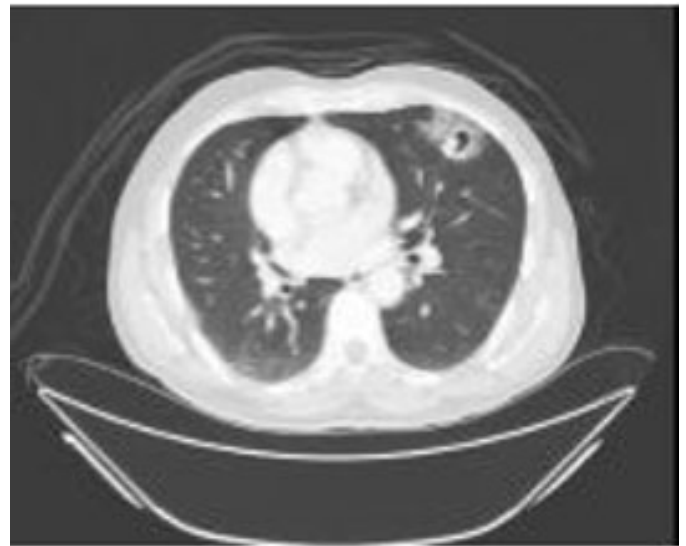


Figure 2: Post-operative CT axial section (lung window) showing cavitary nodule and ground-glass appearance with interlobular septal thickening.

Then, he underwent a left lung upper lobectomy and mediastinal lymph node dissection as treatment for expected lung adenocarcinoma. The histopathological exam of the mass revealed metastatic UC. On follow-up, he has been doing well and had no evidence of recurrence of metastasis on imaging four years after surgery.

## DISCUSSION

The lung is one of the most common sites of distant metastasis from UC. Usual patterns of pulmonary involvement include multiple nodules, a solitary mass, or interstitial micronodules [3]. The spread of UC primarily due to the regional lymphatics. Distant metastasis typically does not occur in the absence of penetration of the deep muscular layer of the bladder by tumor. The most common sites of distant metastases are liver, lung, mediastinum, bone, and adrenal gland [2]. The differential diagnosis of multiple pulmonary cavities is not extensive. More common causes include bacterial, fungal, and parasitic infections and immunologic disorders. Metastatic UC is rarely cited as a cause of cavitary metastases [5]. In our case, a 3-cm slowly growing metastatic lesion in the upper lobe of the left lung was detected on follow-up CT scan five years after the surgery. Although lung metastasis of 3 cm or greater is considered a significant poor prognostic factor, this patient is still alive and well four years after metastasis resection. The progression free survival after pulmonary metastasis resection with curative intent is around 26% [6]. The longer the time to recurrence was found to be associated with better survival [7]. The long survival after metastasectomy in our case could be attributed, in part, to the late presentation of a solitary pulmonary metastasis.

Whether the origin of the pulmonary metastasis in our case is upper tract or bladder is not clear as there are no clear poor prognostic risk factors whether clinical/imaging or histopathological (grade, stage, lymph nodes) could be identified in either.

## CONCLUSION

Pulmonary metastasis from urothelial origin can have cavitary appearance on CT and can happen after more than five years of primary tumor resection. Long-term follow-up is necessary for detection of late metastasis that can be resected if solitary pulmonary with possible long-term survival.

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## Author Contributions

Ahmed Mousa Almuhanna – Conception of the work, Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all

aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Ahmed K Alshammari – Design of the work, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Sukainah M Almuhanna – Design of the work, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mohamed A Gomha – Design of the work, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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## Conflict of Interest

Authors declare no conflict of interest.

## Data Availability

All relevant data are within the paper and its Supporting Information files.

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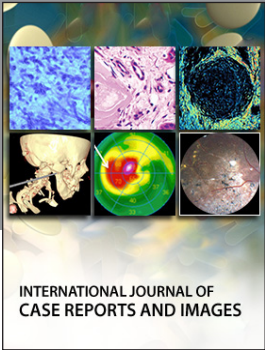
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