

## Case Report

# Two cases of lung metastasis originating from acquired cystic kidney disease-associated carcinoma

Akikazu Kawase<sup>1</sup>, Kazuhito Funai<sup>1</sup>, Shuhei Iizuka<sup>1</sup>, Takashi Yamashita<sup>1</sup>, Hiroaki Oiwa<sup>1</sup>, Haruhiko Sugimura<sup>2</sup>, Norihiko Shiiya<sup>1</sup>

<sup>1</sup>First Department of Surgery, Hamamatsu University School of Medicine, Japan; <sup>2</sup>Department of Tumor Pathology, Hamamatsu University School of Medicine, Japan

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**Abstract:** Case 1 involved a 70-year-old man on hemodialysis for chronic nephritis for 19 years, who had undergone left nephrectomy for acquired cystic kidney disease (ACKD)-associated renal cell carcinoma (RCC) (pT2aNOMO; stage II) 5 years earlier. An abnormal pulmonary nodule was detected on follow-up chest computed tomography (CT). We performed wedge resection of the right lower lobe, and diagnosed metastatic lung tumor originating from ACKD-associated RCC histopathologically. Case 2 involved a 52-year-old man on hemodialysis for diabetic nephropathy for 14 years, who had undergone bilateral nephrectomy for ACKD-associated RCC (pT2aNOMO; stage II) 1 year earlier. An abnormal pulmonary nodule was detected on follow-up CT. We performed wedge resection of the right lower lobe, and diagnosed metastatic lung tumor originating from ACKD-associated RCC histopathologically. Although the prognosis of ACKD-associated RCC is favorable and lung metastasis is rare, annual systemic screening appears important for good prognosis.

**Keywords:** Neoplasm metastasis, renal cell carcinoma, metastasectomy, cystic kidney diseases

## Introduction

The development of renal cell carcinoma (RCC) is the most serious complication in patients on hemodialysis. Although the risk is 100 times that of the normal population, prognosis remains favorable because tumors are usually detected on screening while still small in Japan [1, 2]. Kojima et al. found no patients with distant metastases among the 44 patients with RCC they detected on dialysis [1]. In those 44 cases, lung metastases were detected in 3 cases postoperatively [1]. Resection of lung metastasis of RCC detected on dialysis or acquired cystic kidney disease (ACKD)-associated RCC has not previously been reported. We encountered two cases of resection of lung metastasis of RCC detected on dialysis or ACKD-associated RCC, and report those two cases here.

## Case report

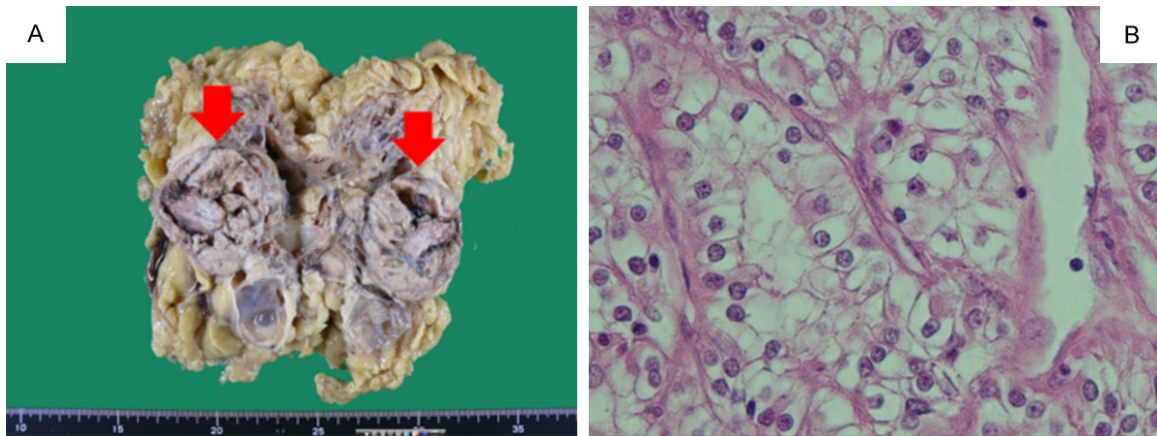
### Case 1

A 70-year-old man was admitted to our hospital in January 2013 with a nodule in the right lower

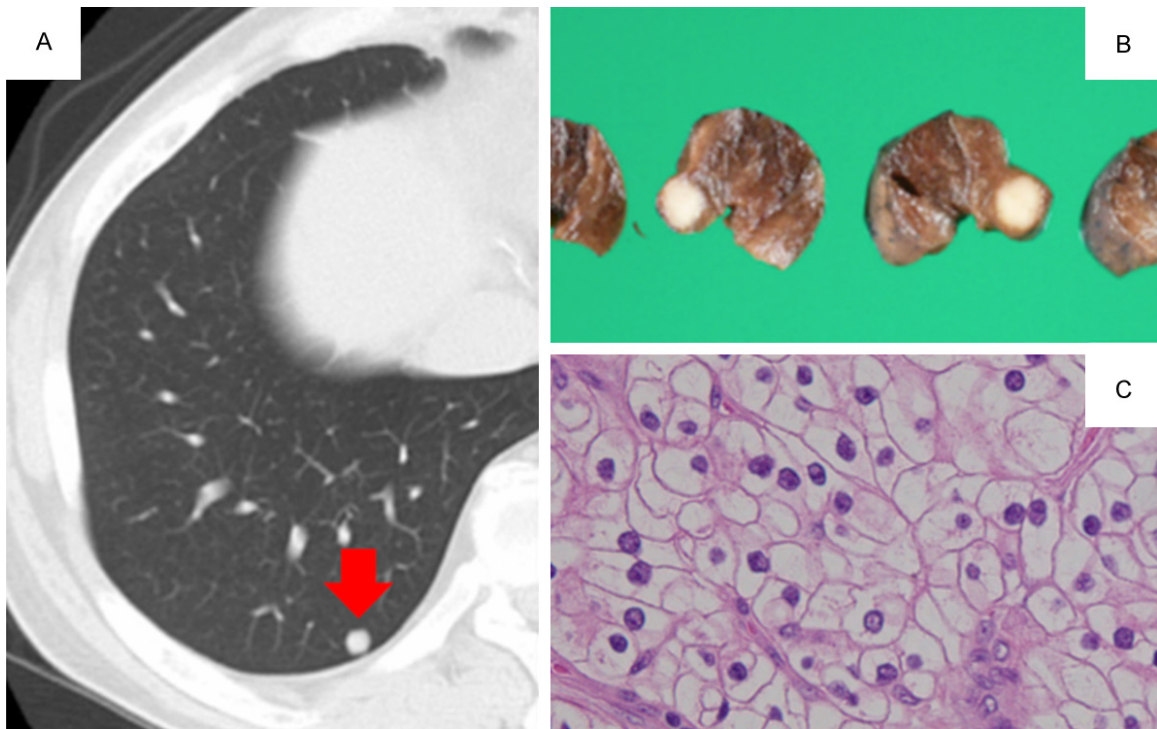
pulmonary lobe. He was on hemodialysis for chronic nephritis from 1994, and underwent left nephrectomy for RCC in 2008. Macroscopically, background kidney was shrunken with numerous cysts, and primary tumor was a well-defined, grayish white nodule, 7 cm in diameter (**Figure 1A**). Microscopically, primary tumor revealed mainly a solid tumor consisting of atypical cells with clear cytoplasm (**Figure 1B**). So the tumor was diagnosed as ACKD-associated RCC. Pathological stage of the RCC was pT2aNOMO; stage II. An abnormal pulmonary nodule was detected on follow-up chest computed tomography (CT) and showed gradual enlargement, so our division was consulted. CT demonstrated a well-defined, solid, round, 8-mm nodule, in segment 9 of the right lower lobe (**Figure 2A**). CT suggested the nodule represented a metastatic lung tumor, benign tumor, low-grade malignant tumor or primary lung carcinoma. Surgery was performed by video-assisted thoracoscopic surgery. We performed wedge resection of the right lower lobe.

Macroscopically, the tumor was a well-defined, white nodule, 7 mm in diameter (**Figure 2B**).

## Lung metastasis of ACKD-associated RCC



**Figure 1.** A. Macroscopic photograph of primary RCC with the shrunken, cystic background kidney of case 1. B. Microscopic photograph of primary RCC of case 1.

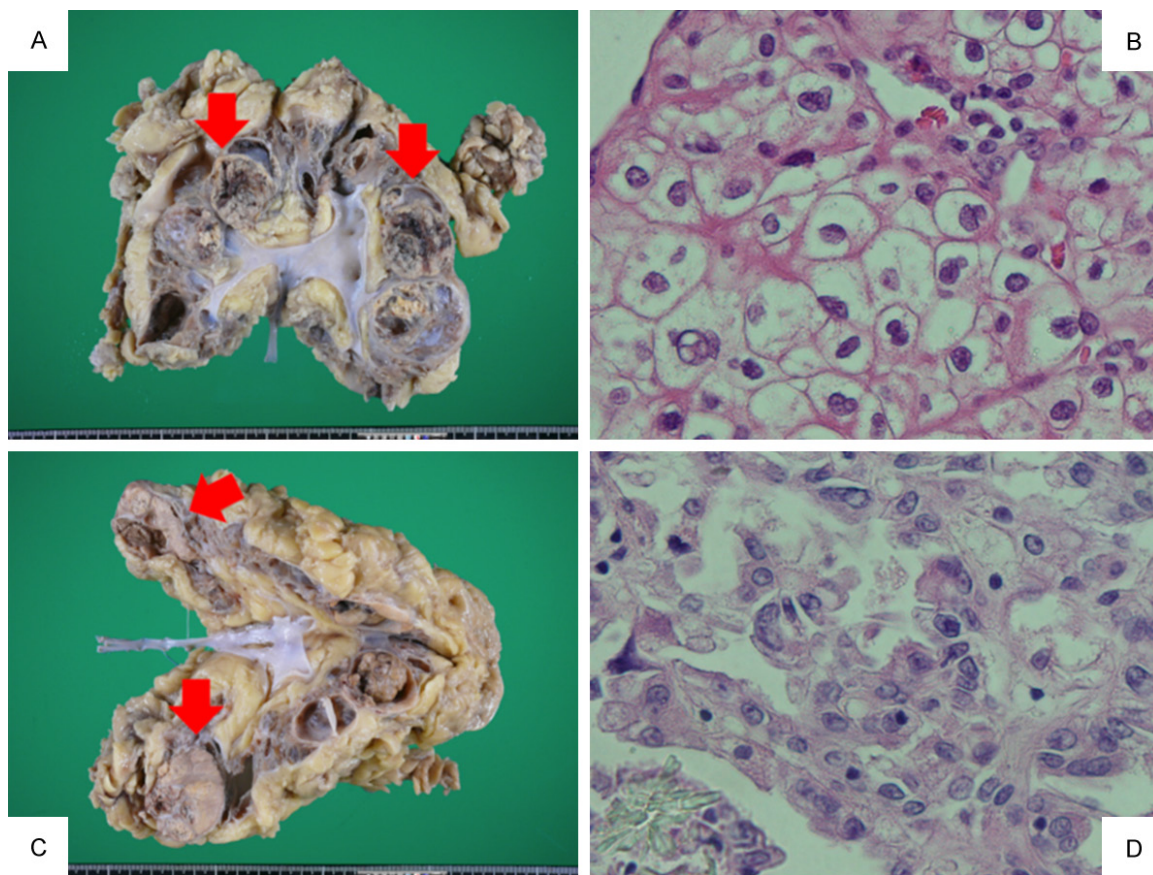


**Figure 2.** A. Chest CT of case 1. B. Macroscopic photograph of metastatic lung tumor of case 1. C. Microscopic photograph of metastatic lung tumor originating from RCC of case 1.

Histological examination revealed a solid tumor consisting of atypical cells with clear cytoplasm (**Figure 2C**). Immunohistochemically, the neoplastic cells reacted positively for RCC marker and CD10, but showed negative results for CK7, CK20, TTF-1 and napsin A. This tumor was therefore diagnosed as metastatic lung tumor originating from ACKD-associated RCC.

### Case 2

A 52-year-old man was admitted to our hospital in March 2013 with a nodule in the right lower pulmonary lobe. He had been on hemodialysis for diabetic nephropathy from 1999, and underwent bilateral nephrectomy for ACKD-associated RCC in 2012. Macroscopically, back-



**Figure 3.** A. Macroscopic photograph of right primary RCC with the shrunken, cystic background kidney of case 2. B. Microscopic photograph of right primary RCC of case 2. C. Macroscopic photograph of left primary RCC with the shrunken, cystic background kidney of case 2. D. Microscopic photograph of left primary RCC of case 2.

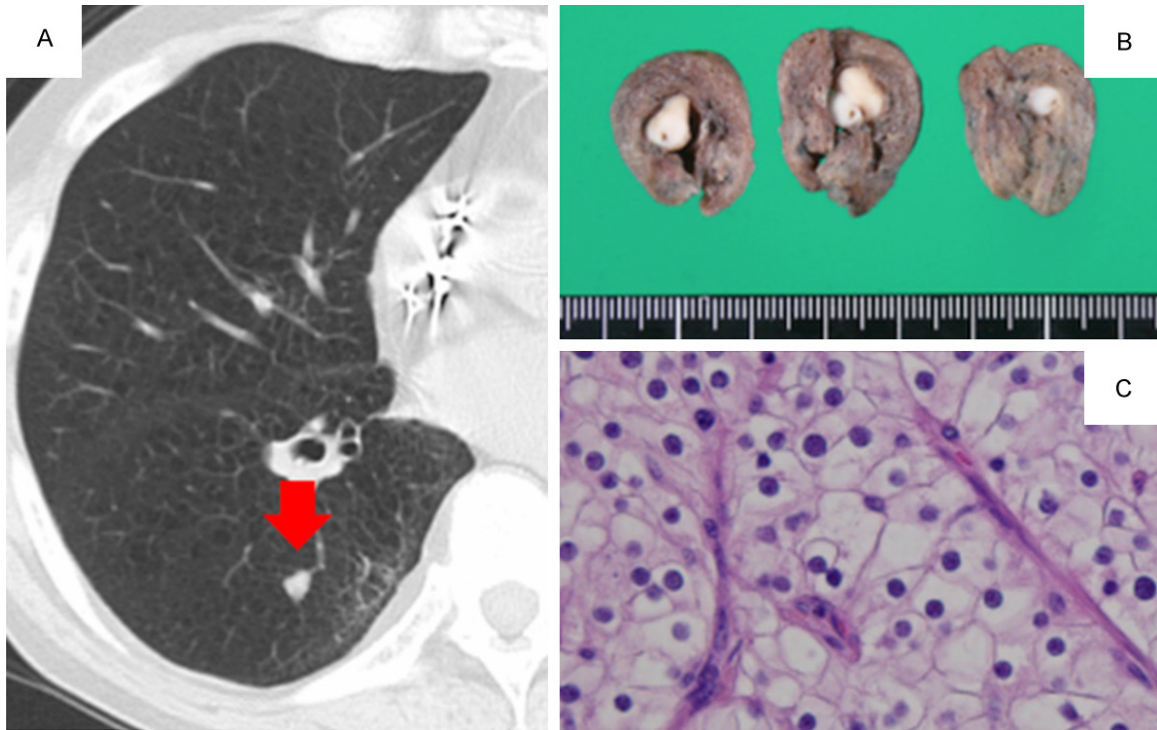
ground bilateral kidneys were shrunken with numerous cysts, primary tumor was a well-defined, grayish white nodule, 59 mm in diameter (**Figure 3A**), and primary left tumor was a well-defined, grayish white nodule, 45 mm in diameter (**Figure 3C**). Microscopically, primary tumor of right kidney revealed mainly a solid tumor consisting of atypical cells with clear cytoplasm (**Figure 3B**), and primary tumor of left kidney revealed mainly a solid tumor consisting of atypical cells with eosinophilic cytoplasm (**Figure 3D**). So the tumors were diagnosed as ACKD-associated RCCs. Pathological stage of the right RCC was pT2aNOMO; stage II, and pathological stage of the left RCC was pT1NOMO; stage I. An abnormal pulmonary nodule was detected on follow-up CT and showed gradual enlargement, so our division was consulted. CT demonstrated a well-defined, solid, round, 8 mm in diameter, in segment 10 of the right lower lobe (**Figure 4A**). CT suggest-

ed the nodule represented a metastatic lung tumor, benign tumor, low-grade malignant tumor or primary lung carcinoma. Surgery was performed by video-assisted thoracoscopic surgery. We performed wedge resection of the right lower lobe.

Macroscopically, the tumor was a well-defined, white nodule, 6 mm in diameter (**Figure 4B**). Histological examination revealed a solid tumor consisting of atypical cells with clear cytoplasm (**Figure 4C**). Immunohistochemically, the neoplastic cells reacted positively for RCC marker and CD10, but showed negative results for TTF-1 and napsin A. The tumor was therefore diagnosed as metastatic lung tumor originating from ACKD-associated RCC.

#### Discussion

Although the risk of RCC in hemodialysis patients is 100 times that of the normal popu-



**Figure 4.** A. Chest CT of case 2. B. Macroscopic photograph of metastatic lung tumor of case 2. C. Microscopic photograph of metastatic lung tumor originating from RCC of case 2.

lation, prognosis is favorable because tumors are generally detected by screening while still small in Japan [1, 2]. Kojima et al. reported finding no patients with distant metastasis among the 44 patients with RCC detected on dialysis [1]. In these 44 cases, lung metastases were detected postoperatively in 3 cases [1]. In those 3 cases, surgical resection was not performed, so the diagnosis was made clinically. We pathologically diagnosed 2 cases of lung metastasis originating from ACKD-associated RCC. Although the prognosis of ACKD-associated RCC was favorable and lung metastasis is rare, annual systemic screening appears important for patients with this disease.

The 5-year survival rate for patients with kidney or renal pelvis cancer with distant metastasis was 12% according to Cancer Statistics, 2015 [3]. On the other hand, 5-year survival rate of patients who underwent metastasectomy for lung metastasis originating from RCC was 34-58% in some reports [4-11]. Recently, systemic therapy for advanced RCC is changing dramatically because of appearance of new agent that target VEGF pathway or mTOR pathway [12], these new agents are not always used

in all RCC patients on dialysis because of criteria for use or adverse event. Metastasectomy may thus represent the most important therapy for patients with lung metastasis originating from RCC, especially in dialysis patients.

#### Disclosure of conflict of interest

None.

**Address correspondence to:** Dr. Kazuhito Funai, First Department of Surgery, Hamamatsu University School of Medicine, 1-20-1, Handayama, Higashi-ku, Hamamatsu, Shizuoka 431-3192, Japan. Tel: +81-53-435-2276; Fax: +81-53-435-2272; E-mail: kfunai@hama-med.ac.jp

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## Lung metastasis of ACKD-associated RCC

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