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## Case Report

# Hemoptysis due to a lung metastasis of renal cell carcinoma: A case report ☆☆☆

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## ABSTRACT

A 53-year-old man with a history of surgery for renal cancer was referred to our hospital due to massive hemoptysis. Contrast-enhanced CT revealed a well-enhanced pulmonary nodule suggestive of a tumor (diameter of 16 mm), which was considered a causal lesion. Bronchial artery embolization was successfully performed and subsequently hemoptysis disappeared. However, hemoptysis recurred 6 months later, and the tumor was surgically resected. Pathological examination revealed the resected tumor was a lung metastasis of renal cell carcinoma, which directly invaded into pulmonary bronchus. Hemoptysis secondary to lung metastasis of renal cell carcinoma has rarely been reported in the literature.

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## Introduction

Hemoptysis is a common symptom observed in clinical practice. However, when bleeding becomes massive, it can occasionally lead to a life-threatening condition. Therefore, hemoptysis is managed in consideration of severity of hemoptysis and the kind and location of the causative lesions.

Hemoptysis usually occurs secondary to a variety of disorders including infection, inflammation, tumor, vascular malformation, and trauma [1]. Common diseases are tuberculosis, bronchiectasis, and primary lung cancer [2,3]. On the other hand, lung metastasis is uncommon in cases with hemopty-

sis. Metastatic tumors originating from renal tumors are rarely reported [4].

Herein, we report a rare case of massive hemoptysis secondary to lung metastasis of renal cell carcinoma (RCC), which was successfully treated by bronchial artery embolization (BAE).

## Case report

A 53-year-old man was referred to our hospital due to massive hemoptysis (approximately 200 mL/d for 1 week). His vital signs were stable, and hemoglobin level was 11.5 g per

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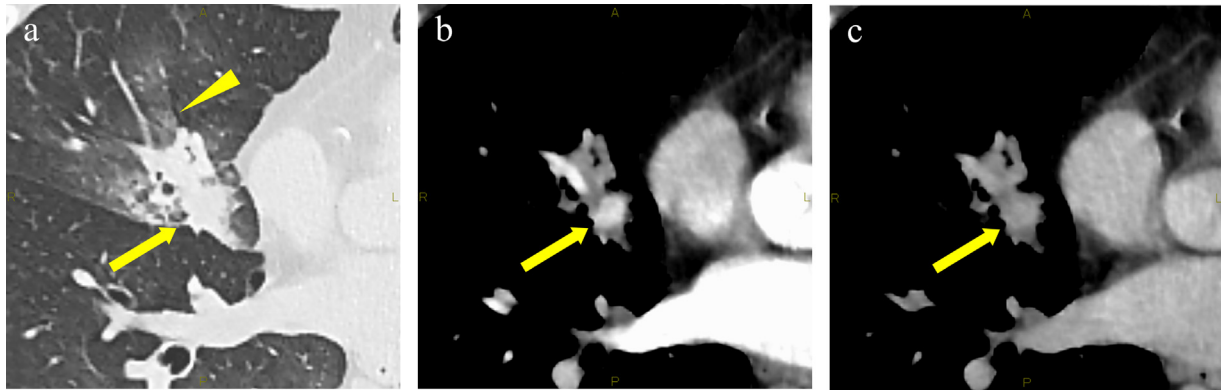
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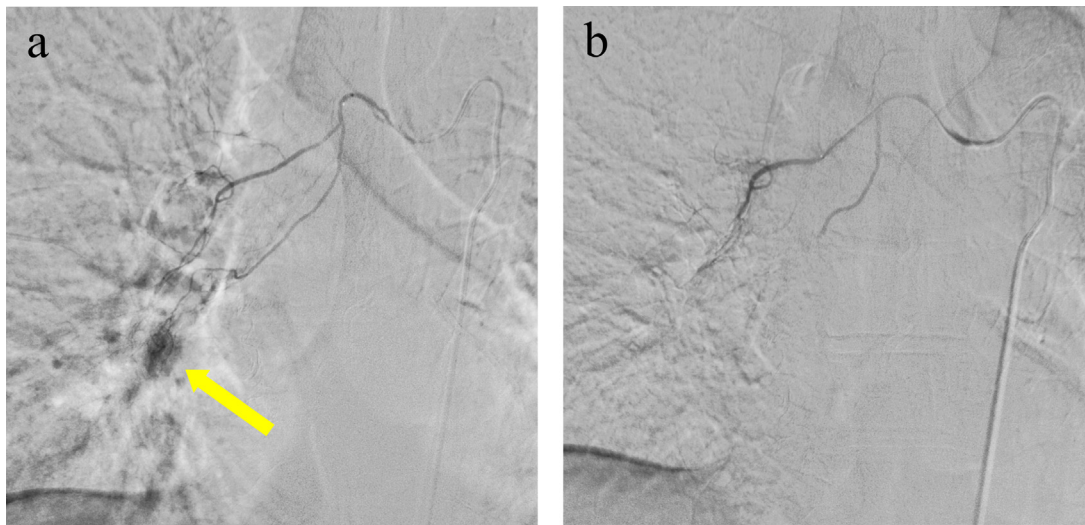
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**Fig. 1** – Contrast-enhanced computed tomography shows a 16-mm nodule (arrow) with peritumoral bleeding (arrowhead) in middle lobe of right lung (a). The nodule (arrow) has hypervascularity in early phase (b) and washout in the delayed phase (c). The lesion is suspected of a lung metastasis of renal carcinoma or vascular lesion.



**Fig. 2** – Right bronchial angiography shows an enhanced nodule (arrow) with no extravasation (a). The findings suggest the nodule is not a vascular lesion, but a tumor suspected of a lung metastasis of renal cell carcinoma. The nodule was successfully embolized with gelatin sponge particles (b). The tumor was diagnosed pathologically as a lung metastasis of renal cell carcinoma.

deciliter. The patient had a history of surgery for renal cancer (76 mm in size), which was limited to the left kidney. The tumor was successfully resected 2 months before, and pathologically diagnosed as clear RCC. The patient had no history of bronchiectasis or cystic fibrosis, and no past exposure to tuberculosis, nontuberculous mycobacteria, or aspergillus.

Contrast-enhanced computed tomography (CE-CT) showed a nodule 16 mm in size with peritumoral hematoma in the middle lobe of the right lung (Fig. 1a). The nodule had well-enhancement in the arterial phase of CE-CT and washout in the venous phase (Figs. 1b and c). We considered the nodule was causing hemoptysis and suspected tumor or a vascular lesion including arterial-venous malformation, aneurysm, or varix. We performed embolization to stop hemoptysis.

Right bronchial arteriography revealed a nodule in the middle lobe of the right lung was enhanced, but there was no ex-

travasation, arterio-venous shunt, or intensive enhancement of the lesion (Fig. 2a). These findings suggested the nodule was not a vascular lesion but a tumor. We suspected lung metastasis of renal cell carcinoma. We successfully embolized the tumor and the right bronchial artery with gelatin sponge particles. Angiography after BAE showed the nodule was not enhanced (Fig. 2b). Subsequent pulmonary arteriography did not reveal any abnormalities.

After BAE, hemoptysis disappeared and the patient was discharged 8 days later; however, hemoptysis recurred 6 months after BAE with regrowth of the tumor. Then, the middle lobe of the right lung was resected with a thoracoscope, and the tumor was diagnosed pathologically as lung metastasis of renal cell carcinoma, which directly invaded into pulmonary bronchus.

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## Discussion

We described a case with massive hemoptysis due to lung metastasis of RCC. Hemoptysis usually develops by infectious diseases or primary lung cancer [5]; however, there have been few reports of lung metastasis as a causal disorder of hemoptysis [6]. As hemoptysis must be managed depending on the kind of causal disorder, lung metastasis should be considered as one of the differential diagnoses of hemoptysis [7].

CT is established as a diagnostic tool to provide useful information regarding several lung diseases. CE-CT is not always used for cases with hemoptysis and non-CE-CT is often used to identify causal disorders. A previous study reported lung metastasis of RCC is more enhanced than primary lung carcinoma [8]. In the present case, the lung nodule was well-enhanced in the arterial phase, and we observed washout in the venous phase. The pattern of enhancement of the lung nodule was similar to that of typical RCC [9]. This CE-CT finding suggests the importance of including lung metastasis of RCC in the differential diagnosis of hemoptysis.

As hemoptysis from lung metastasis of RCC is rare, it remains unclear whether BAE is an efficient and safe treatment for such a disorder. However, the present case suggests that BAE is useful to manage hemoptysis due to lung metastasis of RCC.

In conclusion, we demonstrated a rare case of hemoptysis due to lung metastasis of RCC. CE-CT was a useful diagnostic method for the inclusion of metastatic lung tumor in the differential diagnosis of hemoptysis.

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## IRB approval

Institutional review board in the institution approved the publication of this case.

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## Patient consent

We obtained written and informed consent for the publication of this case from the patient.

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