Case Report

Endobronchial Metastasis from Resected Renal Cell Carcinoma: An Unusual Presentation After Four Years

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Abstract

Endobronchial metastasis (EBM) from renal cell carcinoma (RCC) mimicking endobronchial obstruction due to bronchogenic carcinoma is rare. Total lung collapse due to EBM from RCC is even more uncommon. We report the case of a female patient who presented with cough, dyspnoea and collapse of the right lung. She gave a history of nephrectomy on the left side four years back for some malignant lesion. On bronchoscopy, a polypoidal mass was observed which completely occluded the right main bronchus with features of clear cell adenocarcinoma. Immunohistochemistry was positive for CD 10 as well as PAX-8 and negative for thyroid transcription factor-1 (TTF-1) and Napsin, suggestive of metastatic renal cell carcinoma. The patient had multiple metastases in the brain and the adrenal gland also. She was started on pazopanib and given intracranial radiation but died after two months. Our case highlights the importance of making a distinction between EBM from the primary lung cancers because the treatment modalities differ significantly. **[Indian J Chest Dis Allied Sci 2020;62:23-25]**

Key words: Renal cell carcinoma, Endobronchial metastasis, Total lung collapse, Polypoidal mass.

Introduction

Endobronchial metastases (EBM) are associated with primary tumours of breast, kidney, colon, rectum, ovary, uterus, cervix, thyroid, testes, prostate, adrenal, and skin.[1,2] Metastasis from renal cell carcinoma (RCC) most commonly occurs to the lungs, lymph nodes, bone, liver and brain.[3] Pulmonary metastases from RCC mostly manifests as nodules, but can also present as EBM.[4] Large EBM due to RCC causing complete collapse of the lung is rare. *To the best of our knowledge*, only one case of complete lung collapse due to RCC has been reported till now.[5] We report a case of complete collapse of the right lung due to EBM from RCC resected four years earlier.

Case Report

A 45-year-old female, non-smoker, presented with dry cough for six months and exertional dyspnoea for the last one month. She had no chest pain, fever, palpitations, paroxysmal nocturnal dyspnoea, hoarseness, haemoptysis or weight loss. There was a past history of nephrectomy on the left side about four years back for some malignant lesion. The patient had lost all records after the nephrectomy surgery.

On clinical examination, she was tachypnoeic with a respiratory rate of 30/min and oxygen saturation of 96% on room air.

Chest examination revealed that the trachea was deviated to the right side. Respiratory movements of the right hemithorax were decreased with absent vocal fremitus. Percussion revealed dull note and breath sounds were absent on auscultation on right hemithorax. Examination of abdomen showed a nephrectomy scar on the left side.

Chest radiograph (postero-anterior view) showed an opaque right hemithorax with ipsilateral shifting of the mediastinum (Figure 1). Contrast enhanced computed tomography (CECT) of thorax and abdomen showed a heterogeneous mass over the right hilar region causing complete collapse of the right lung along with multiple mediastinal lymphadenopathy, metastatic lesions in the liver and both adrenal glands and an absent left kidney (Figure 2). Contrast enhanced magnetic resonance imaging (MRI) of the brain showed multiple heterogeneous metastatic lesions in the right cerebral hemisphere with surrounding oedema and some midline shift (Figure 3). During flexible bronchoscopy, a white polypoidal mass was seen which completely occluded the right main bronchus (Figure 4).

Histopathology of the biopsied endobronchial mass revealed an infiltrating tumour with large areas of necrosis and features of clear cell adenocarcinoma. The tumour was strongly immunopositive for CD10 and PAX-8 and negative for Napsin and thyroid transcription factor-1 (TTF-1), suggestive of metastatic renal cell carcinoma (Figure 5).

Immunohistochemistry of the endobronchial tissue stained negatively for Napsin and TTF-1 (Figure 5E), that ruled out the possibility of primary endobronchial tumour of the lung.

She was started on pazopanib (800mg per day), a selective multi-targeted receptor tyrosine kinase inhibitor

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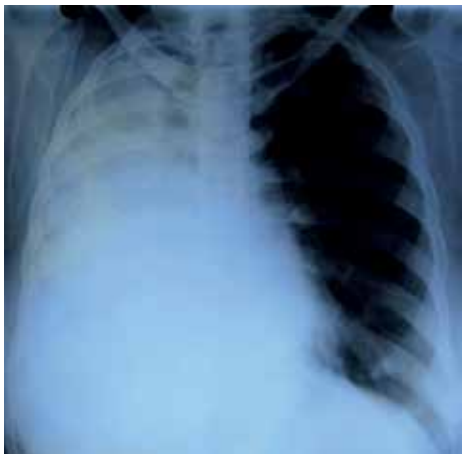

Figure 1. Chest radiograph (postero-anterior view) showing an opaque right hemithorax with shift of the mediastinum to the ipsilateral side, suggestive of right lung collapse.

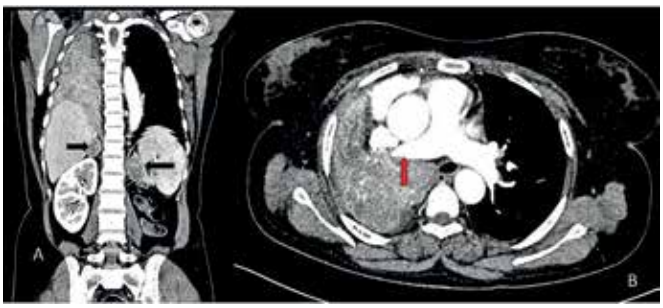

Figure 2. Contrast enhanced computed tomography of thorax and abdomen along the coronal plane (A) showing complete collapse of the right lung, heterogeneous masses in bilateral adrenal glands suggestive of metastases (black arrows) and an absent left kidney and transverse section of thorax (B) showing a large heterogeneous mass in the right hilar area involving the right main stem bronchus resulting in complete collapse of the right lung and encasement of the right pulmonary artery (red arrow).

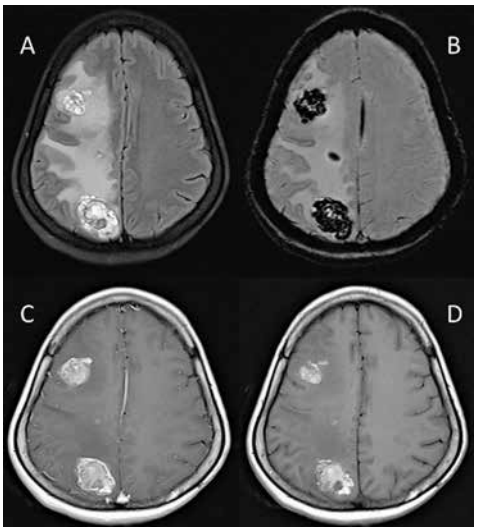

Figure 3. Magnetic resonance imaging of the brain with contrast showing multiple T2 heterogeneous intensity lesions in the right hemisphere with a midline shift towards the left. The lesions have moderate perilesional oedema with blooming on SWI (B) and hyperintense appearance on T1 (D), suggestive of haemorrhagic metastases.

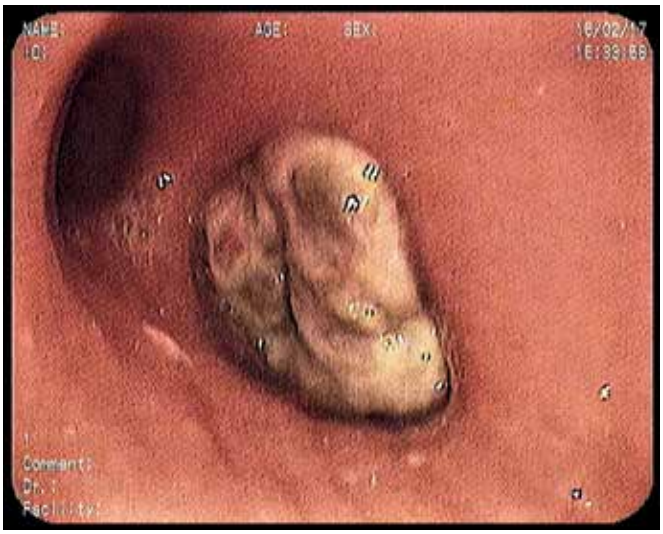

Figure 4. Flexible bronchoscopy image at carina showing complete occlusion of the right main bronchus by a large whitish polypoid mass.

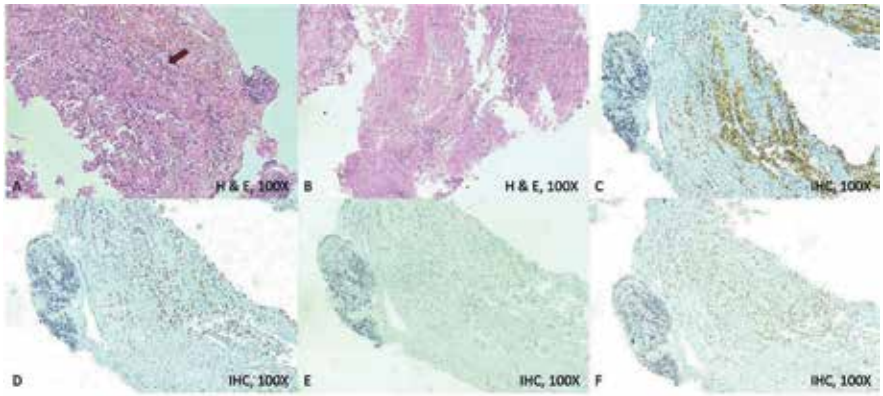

Figure 5. Light microscopic examination showing an infiltrating tumour comprising of clear cells (arrow) (A) and necrosis (B). Immunohistochemistry shows expression of CD 10 (diffuse, membranous) (C) and PAX 8 (diffuse nuclear). Immunostaining for TTF1 (E) and Napsin (E) were negative.

that blocks tumour growth and inhibits angiogenesis, for advanced renal cell carcinoma and referred for intra-cranial radiation therapy for the multiple cerebral metastases. She had received whole brain radiation of 30Gy divided in 10 fractions.

After about two months of follow-up, she was re-admitted in the intensive care unit in a very poor general condition with loss of consciousness. Subsequently, she died after three days, despite all supportive care.

Discussion

The various pulmonary manifestations of RCC include, metastatic disease, pulmonary and tumour embolism, arterio-venous fistula and para-neoplastic features, such as cough and diaphragmatic palsy. The metastatic manifestations include parenchymal, pleural, endobronchial, nodal metastasis or pleural effusion.[4] Although pulmonary metastasis from RCC is mostly in the form of solitary or multiple nodules, it can also manifest with metastasis to the pleura, endobronchial tissue, sternum and ribs.[6,7] EBM is defined as bronchoscopically visible non-pulmonary tumour, involving the proximal central bronchus or sub-segmental bronchi with a lesion histologically similar to that previously demonstrated by the primary tumour.[8] Breast, colorectal and renal carcinomas are commonly associated with EBM, however, other extrapulmonary sites involved with EBM include ovary, thyroid, uterus, testis, nasopharynx, prostate, adrenal glands and skin.[1,2]

Sivaramakrishna *et al*[9] retrospectively followed up 209 of 343 patients operated for initially localised RCC. Of these 39 had developed metastasis with lungs being the commonest site (37%), followed by bone (22%), liver (19%) and brain (8%).[9] Sorensen[1] reviewed the literature from 1962 to 2002 and reported 204 cases of EBM from 20 different primaries of which 34 were RCC with a median recurrence time of 35 months. Kim *et al*[2] retrospectively reviewed 18 cases of EBM over a period of 10 years at a single hospital of which two were RCC with haemoptysis as their presenting symptom. Our patient presented with cough and dyspnoea four years after getting diagnosed with RCC.

Recurrence of RCC after resection usually depends upon the advanced stage of the disease at the time of initial presentation. According to the four developmental modes of EBM as described by Kiryu *et al*,[8] our case was of type I with direct metastasis to the bronchus. The other modes were type II, where bronchial invasion is by a parenchymal lesion; type III, where bronchial invasion is by mediastinal or hilar lymph node metastasis and type IV, where peripheral lesions extended along the proximal bronchus.[8]

In conclusion, renal cell carcinoma commonly metastasises to the lungs but rarely as EBM causing complete atelectasis of one lung. Our case presented with a large heterogeneous mass involving the right main bronchus resulting in complete collapse of the right lung. In our clinical practice, endobronchial lesion causing collapse of lung is mostly due to primary malignancy of the lung. However, there should always be a clinical suspicion of EBM, which calls for a meticulous history and physical examination so that an extra-thoracic primary lesion is not overlooked. Our case highlights the importance of making a distinction between EBM from the primary lung cancers as the treatment modalities differ significantly.

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