


## Endobronchial metastases from a primary embryonal carcinoma

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### Keywords

Cryosurgery, embryonal carcinoma, endobronchial metastases, endobronchial tumour.

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### Introduction

Lung metastases from extrapulmonary malignancies are observed frequently in clinical practice; by contrast, endobronchial metastases (EBMs) from extrapulmonary malignancies are rare and may have distinct histopathological etiologies [1–3]. Primary lung cancer is the most common cause of endobronchial tumours. Extrapulmonary malignancies that are frequently associated with metastases to the central airways include tumours of breast, colorectal, renal, or thyroid origin [2–5]. Although mediastinal lymphadenopathy is frequently observed in association with testicular seminoma, EBMs from embryonal carcinomas are extremely rare [4,5]. In this report, we present a case of EBM from a primary embryonal carcinoma.

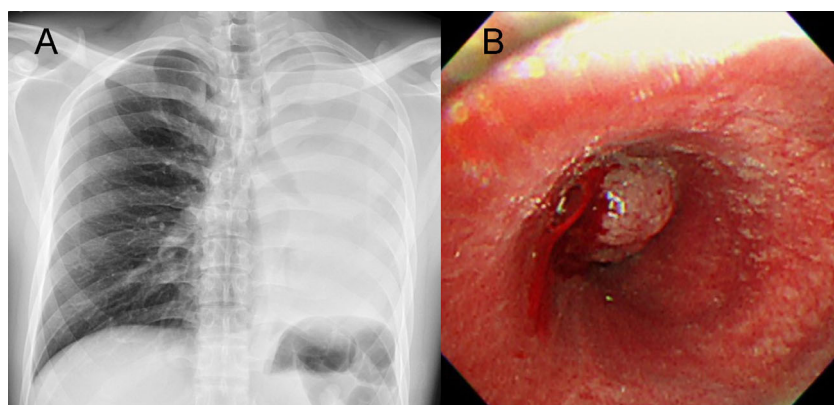
### Case Report

A 24-year-old man with no relevant past medical history presented to our hospital with a chief complaint of shortness of breath lasting for several days. Upon questioning, the patient revealed that he experienced cough,

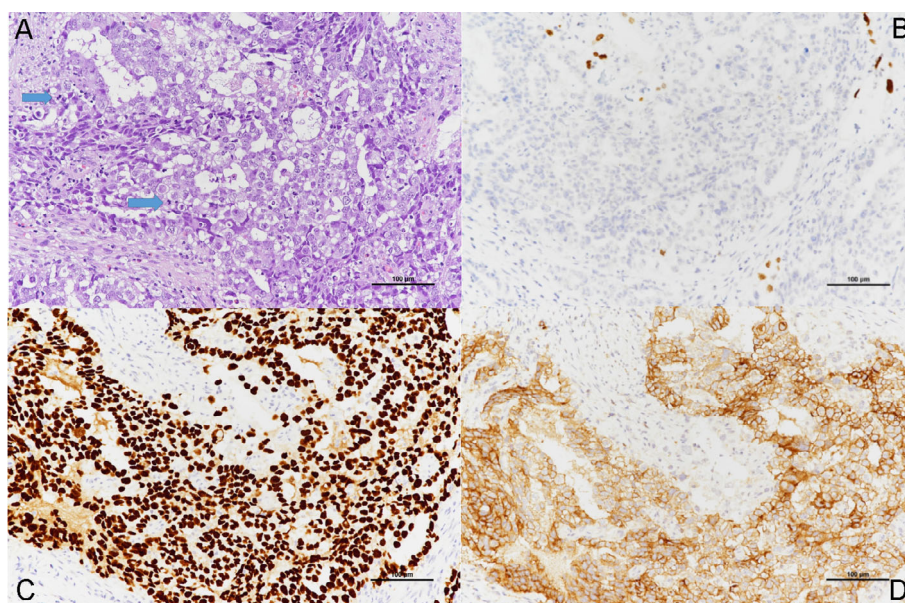
### Abstract

We report the case of a 24-year-old man who presented with chief complaints of shortness of breath and haemoptysis; chest radiography revealed complete collapse of the left lung. Bronchoscopy revealed an endobronchial tumour with complete obstruction of the left main bronchus. Cryosurgical excision was performed; tissue pathology confirmed the diagnosis of metastatic embryonal carcinoma. The patient underwent a right orchiectomy followed by a bleomycin + etoposide + cisplatin (BEP) chemotherapy regimen.

haemoptysis, shortness of breath, and occasional chest pain for the past several days. He reported no fever, chills, cold sweats, weight loss, or decreased appetite. A chest radiograph at admission revealed complete collapse of the left lung (Fig. 1A). Computed tomography (CT) was notable for left pleural masses, an endobronchial tumour obstructing the left main bronchus, and complete collapse of the left lung, and a soft tissue mass lesion in the right scrotum. Bronchoscopy revealed an endobronchial tumour obstructing the left main bronchus (Fig. 1B). The endobronchial tumour was excised with bronchoscopic cryosurgery; a follow-up chest radiograph revealed some improvement in the status of the left lung. Immunohistochemical staining of the tumour tissue revealed that the cells were thyroid transcription factor-1 (TTF-1)-negative, sal-like protein 4 (SALL4)-positive, and cluster of differentiation 30 (CD30)-positive. These findings were consistent with a final diagnosis of metastatic embryonal carcinoma (Fig. 2). We checked the levels of tumour markers in the patient, including those of alpha-fetoprotein (AFP), beta-human chorionic gonadotropin (B-hCG), and lactate dehydrogenase (LDH). Each tumour marker was found to be



**Figure 1.** Chest radiograph and bronchoscopic view of the endobronchial metastases (EBM). (A) Complete collapse of the left lung on chest radiograph. (B) Bronchoscopic view of the endobronchial tumour within the left main bronchus.



**Figure 2.** Tumour pathology of metastatic embryonal carcinoma. (A) Embryonal carcinoma with a complex glandular growth pattern. The characteristic large, cohesive, and highly pleomorphic tumour cells with moderate amounts of amphophilic cytoplasm, overlapping nuclei, vesicular chromatin, and frequent mitoses are shown (as indicated by the arrows; original magnification: 200 $\times$ ). (B) Immunohistochemical staining with anti-thyroid transcription factor-1 (TTF-1) highlighting cells in the alveolar space (original magnification: 200 $\times$ ). (C) Immunohistochemical staining with anti-sal-like protein 4 (SALL4) revealed diffuse nuclear staining (original magnification: 200 $\times$ ). (D) Immunohistochemical staining with anti-cluster of differentiation 30 (CD30) highlighting diffuse membranous staining (original magnification: 200 $\times$ ).

present in high levels: AFP = 2605.78 ng/mL, B-hCG = 467.41 mIU/mL, and LDH = 937 IU/L. The patient underwent a right orchiectomy followed by a BEP (bleomycin + etoposide + cisplatin) chemotherapy regimen.

## Discussion

We report here the case of a young man with an EBM from a primary embryonal carcinoma who presented shortness of breath and haemoptysis; chest radiography at presentation revealed complete collapse of the left lung.

Lung metastases from extrapulmonary malignancies are reported relatively frequently in clinical practice; however, EBMs from extrapulmonary malignancies are rare [1–3]. Primary lung cancer is the most common cause of endobronchial tumours. Likewise, many kinds of extrapulmonary primary tumours have been associated with EBM, primarily breast, colon, and renal carcinomas [2–4]. EBMs from testicular seminomas are also extremely rare. The majority of testicular tumours arise from testicular germ cells, and are frequently composed of multiple cell types (i.e. mixed-type tumours); most of these are

**Table 1. Reports of previous cases of EBMs.**

		Location	Diagnostic method	Pathology
Öztürk et al. [1]	Case 1	The orifice of right upper lobe	Fibreoptic bronchoscopy	Mixed GCT
	Case 2	Right main bronchus	Fibreoptic bronchoscopy	Mixed GCT
Moreira-Meyer et al. [4]		Left main bronchus (100%), main carina, and right main bronchus (60%)	Videobronchoscopy	Embryonal carcinoma
Özsu et al. [5]		The orifice of the right upper lobe and right intermediary lobe	Fibreoptic bronchoscopy	Testicular seminoma
Turan et al. [6]		Right intermediate bronchus	Rigid bronchoscopy	Somatic-type GCT
Varkey et al. [7]		Left main bronchus	Bronchoscopy	Embryonal carcinoma
Our case		Left main bronchus	Fibreoptic bronchoscopy and cryosurgery	Embryonal carcinoma

EBM, endobronchial metastases; GCT, germ cell tumour.

embryonic carcinomas (50%) or seminomas (30–40%). There are only a few published reports of primary testicular embryonic carcinomas resulting in EBMs [1,4–7].

The most common symptoms of endobronchial tumours are haemoptysis and coughing, with shortness of breath and wheezing reported less frequently. However, some patients are asymptomatic [5]. In our patient, symptoms on presentation included haemoptysis and shortness of breath.

Results from chest radiography in patients with EBM can be quite variable, and may include mediastinal lymphadenopathy, hilar masses, atelectasis, and multiple pulmonary nodules; chest radiographs may also be normal on presentation [6]. Our patient presented with complete collapse of the left lung that was revealed initially by chest radiography.

However, the full diagnosis cannot be made based only on symptoms and chest radiographs; it can be difficult to distinguish between primary lung cancer and tumours of extrapulmonary origin based on these findings alone. To confirm the diagnosis, we obtained a bronchoscopic biopsy specimen to examine the tumour tissue. The flexible bronchoscopy (fibreoptic bronchoscopy) can be performed under sedation without general anaesthesia as compared with rigid bronchoscopy. The former is a simple technique, which is well tolerated and most commonly performed as an outpatient day procedure [8]. The patient underwent bronchoscopic cryosurgery under sedation in our bronchoscopy room to excise the tumour; the final pathology report confirmed the diagnosis of metastatic embryonal carcinoma.

We had evaluated the presence of AFP, B-hCG, and LDH tumour markers. Elevated AFP levels can be secreted by germ cell tumours (GCTs), including embryonal carcinoma, yolk sac tumour, or teratoma. In GCTs, detectable

B-hCG elevation is observed in both seminomas and non-seminomas. The serum level of LDH was directly correlated with tumour burden in non-seminomatous GCTs, which is also useful for the surveillance of patients with advanced seminoma [9]. The tumour markers in our patient showed elevated levels of AFP, B-hCG, and LDH. This was compatible with the diagnosis of embryonal carcinoma. Moreira-Meyer et al. also evaluated the patient tumour markers, and found elevated levels of AFP (55.97 ng/mL) and B-hCG (59.56 mIU/mL). The elevated levels of both tumour markers contribute to the diagnosis of metastatic embryonal carcinoma [4]. Özsu et al. only evaluated the patient's B-hCG level, which was found to be elevated (8.64 mIU/mL) and the final diagnosis was metastatic testicular seminoma [5].

On comparison with previous case reports (Table 1), ours was the first case in which the tissue was obtained using cryosurgery. Other reports obtained tissue samples using forceps biopsy alone or forceps biopsy combined with argon plasma coagulation (APC) to control bleeding. Cryobiopsy provided us with enough sample to perform more extensive immunohistochemical staining. Cryobiopsy has more successful diagnostic results than forceps biopsies due to larger and high-quality (artefact-free) samples. Haemorrhage was observed to be similar during both procedures [10]. Further study on this topic will be needed to evaluate which of the diagnostic methods result in superior outcomes.

In conclusion, EBMs from primary GCTs, notably those associated with total or partial collapse, are extremely rare. We have presented this case to emphasize the importance of distinguishing EBM from primary lung carcinoma and to report the first case in which metastatic embryonal carcinoma was diagnosed by bronchoscopic cryosurgery.

## Disclosure Statement

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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