



## PULMONARY PUZZLES

## A case of progressive breathlessness post partum

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## CLINICAL PRESENTATION

A 35-year-old woman presented with rapidly progressive dyspnoea (WHO functional class III) two months after normal vaginal delivery at term, with no other symptoms. On examination, she was normotensive, with a raised jugular venous pressure, right ventricular (RV) heave, a prominent pulmonary second heart sound and mild pitting leg oedema. Oxygen saturations were 90% on air with a clear chest on auscultation. There was a single enlarged supraclavicular lymph node.

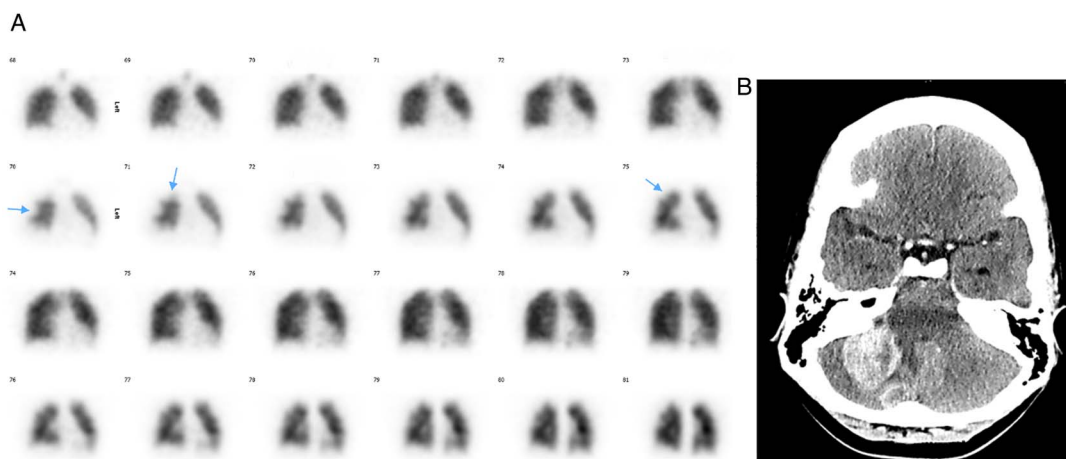
ECG showed sinus tachycardia with right axis deviation. Renal and liver function were normal but brain natriuretic peptide and D-dimer were raised. Chest radiograph showed clear lungs and enlarged proximal pulmonary arteries, with no filling defects or parenchymal disease evident on CT pulmonary angiogram (CTPA). Transthoracic echocardiogram revealed signs of severe pulmonary hypertension (PH) with severely impaired RV function. Right heart catheterisation confirmed

precapillary PH with a mean pulmonary artery pressure of 39 mm Hg, pulmonary wedge pressure of 13 mm Hg, cardiac output of 2.1 L/min and pulmonary vascular resistance of 12.4 Wood units, without reversibility to inhaled nitric oxide.

At this point, assessment was thought to reflect 'moderate risk' chronic thromboembolic PH (CTEPH). She was anticoagulated, and commenced on upfront combination PH therapy<sup>1</sup> with a phosphodiesterase inhibitor (tadalafil) and endothelin receptor antagonist (macitentan). She developed increasing frontal headache, thought to be a consequence of PH therapy. Her headache persisted, despite weaning PH therapies, with associated vomiting but no localising neurological signs, and a CT of the head was performed.

## QUESTION

What is the underlying diagnosis, as suggested by the images below (figure 1A, B)?



**Figure 1** (A) Ventilation perfusion (VQ) scan at presentation showing multiple small peripheral subsegmental defects in the apical, anterior and posterobasal segments of the right lung. Perfusion in much of the left lung is well maintained. The ventilation images show relatively homogeneous distribution of tracer in both lungs. (B) CT of the head with intravenous contrast showing several high-density lesions in the posterior fossa, which enhance strongly post administration of intravenous contrast, with surrounding oedema.

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## ANSWER

CT of the head suggested brain metastases, and the diagnosis of choriocarcinoma was later confirmed on supraclavicular lymph node core biopsy. PH was initially thought to reflect distal CTEPH until the diagnosis of malignancy evolved, with likely pulmonary tumour embolism (PTE) relating to choriocarcinoma.<sup>2,3</sup> The finding of a raised D-dimer (outside the immediate post-partum period) with severe PH, a normal CTPA and distal perfusion defects on ventilation perfusion (VQ) scan is suggestive of tumour microemboli<sup>4</sup> and should raise the suspicion of malignancy.

Malignancy-induced PH due to tumour microemboli comprises a likely spectrum of PTE and pulmonary tumour thrombotic microangiopathy (PTTM), and the distinction between PTE and PTTM is only possible following histological examination. In PTE, coagulated tumour cells obstruct pulmonary arteries. In PTTM, additional fibrointimal proliferation occludes pulmonary arteries, lymphatics and veins. PTTM is usually associated with carcinomas, often gastrointestinal adenocarcinomas, and is uniformly fatal.<sup>4,5</sup> PTE can resolve depending on the chemosensitivity of the underlying tumour.<sup>2</sup>

Choriocarcinomas may be gestational or non-gestational in origin and are potentially very chemosensitive.<sup>6</sup> Prompt diagnosis is therefore crucial to enable access to chemotherapy. Our patient had an excellent initial response to emergency cisplatin-based chemotherapy, with improvement in tumour markers and PH, although stable perfusion defects on repeat VQ. Two months following diagnosis, she developed resistance to second-line chemotherapy, suggesting that this was a non-gestational tumour and the PH suddenly worsened. She died of a PH crisis 3 months after the initial diagnosis. Genetic analysis confirmed a non-gestational tumour.<sup>6</sup>

Clues to the diagnosis of PTE/PTTM in this case included the presence of a raised serum D-dimer without proximal filling defects on CTPA but distal defects on VQ, with rapid onset severe PH, and the history of recent pregnancy. The use of tumour markers in a patient presenting with PH is not

routine, but the finding of grossly raised serum and urine  $\beta$  human chorionic gonadotropin may have led to an earlier diagnosis in this case, as previously reported.<sup>2</sup> Choriocarcinoma is also reported following spontaneous abortions and especially in women with previous hydatiform moles,<sup>6</sup> which may be relevant if risk stratifying other young women in this situation. This case emphasises the importance of consideration of malignant aetiology in a patient presenting with PH, and the potential impact of prompt diagnosis upon oncological outcomes.

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