

# Pulmonary artery thrombus seen as a solitary pulmonary nodule on chest radiograph

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## ABSTRACT

**Solitary pulmonary nodule (SPN) is a diagnostic challenge for both radiologists and physicians. There have been numerous common and uncommon causes of SPN. We report a 30-year-old Indian man with pulmonary thromboembolism, where the pulmonary thrombus was seen as a SPN on the chest radiograph. To the best of our knowledge, this observation has not been published in the literature.**

**Keywords: chronic pulmonary thromboembolism, lung mass, pulmonary nodule, pulmonary thrombus, solitary pulmonary nodule**

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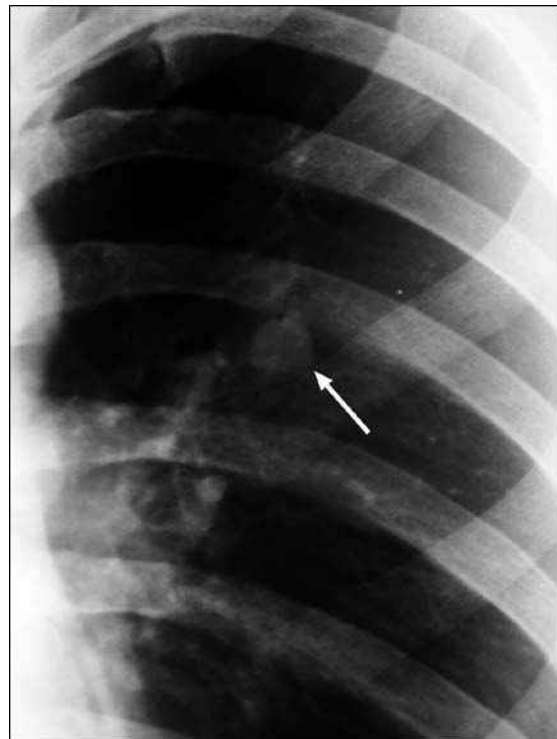
## INTRODUCTION

A nodule is defined on chest radiographs as a rounded opacity, well or poorly defined, measuring up to three cm in diameter.<sup>(1)</sup> Numerous common and uncommon causes of solitary pulmonary nodule (SPN) are known. There have been few reported cases of pulmonary infarct presenting as a subpleural SPN,<sup>(2)</sup> and to the best of our knowledge, any pulmonary thrombus seen as a SPN on a chest radiograph has not been previously reported.

## CASE REPORT

A 30-year-old Indian man presented to the medicine outpatient department with complaints of dry cough for the last three months. There was no history of fever, dyspnoea, chest pain or night sweats. Laboratory investigations revealed an elevated total leucocyte count. All other investigations were unremarkable. The patient was administered a course of antibiotics, but the cough was not relieved. He was then referred to our institution. A chest radiograph revealed a SPN in the left upper zone, in the parahilar location (Fig. 1). A granuloma due to chronic granulomatous disease (e.g. tuberculosis) was suspected. However, in view of the vascular markings leading to the nodule, a differential diagnosis of vascular malformation (e.g. arteriovenous malformation [AVM]) was also kept.

Due to the possibility of an AVM, computed



**Fig. 1** Posteroanterior chest radiograph shows a well-defined nodule in the left upper zone with a few vascular shadows (arrow) leading toward it.

tomography (CT) angiography was performed with a four-slice multidetector CT (MDCT) scanner using the following parameters: 140 kV, 60–100 mAs, a rotation time of 0.5 second and a 1-mm collimation. CT revealed a hypodense filling defect in the superior branch of the left pulmonary artery resulting in its expansion, which was suggestive of thrombosis (Fig. 2). On the lung window CT (Fig. 2b), this thrombus was seen as a linear lobulated nodule. There was a segmental decrease in vascularity in the left upper lobe due to thrombosis. There were also nodular enhancing densities near the carina, indicative of hypertrophied bronchial arteries (Fig. 2d), which suggested chronic thromboembolism.<sup>(3)</sup> Venous Doppler ultrasonography of both the lower legs did not reveal venous thrombosis. Based on the findings of the MDCT, a diagnosis of chronic pulmonary thromboembolism was made.

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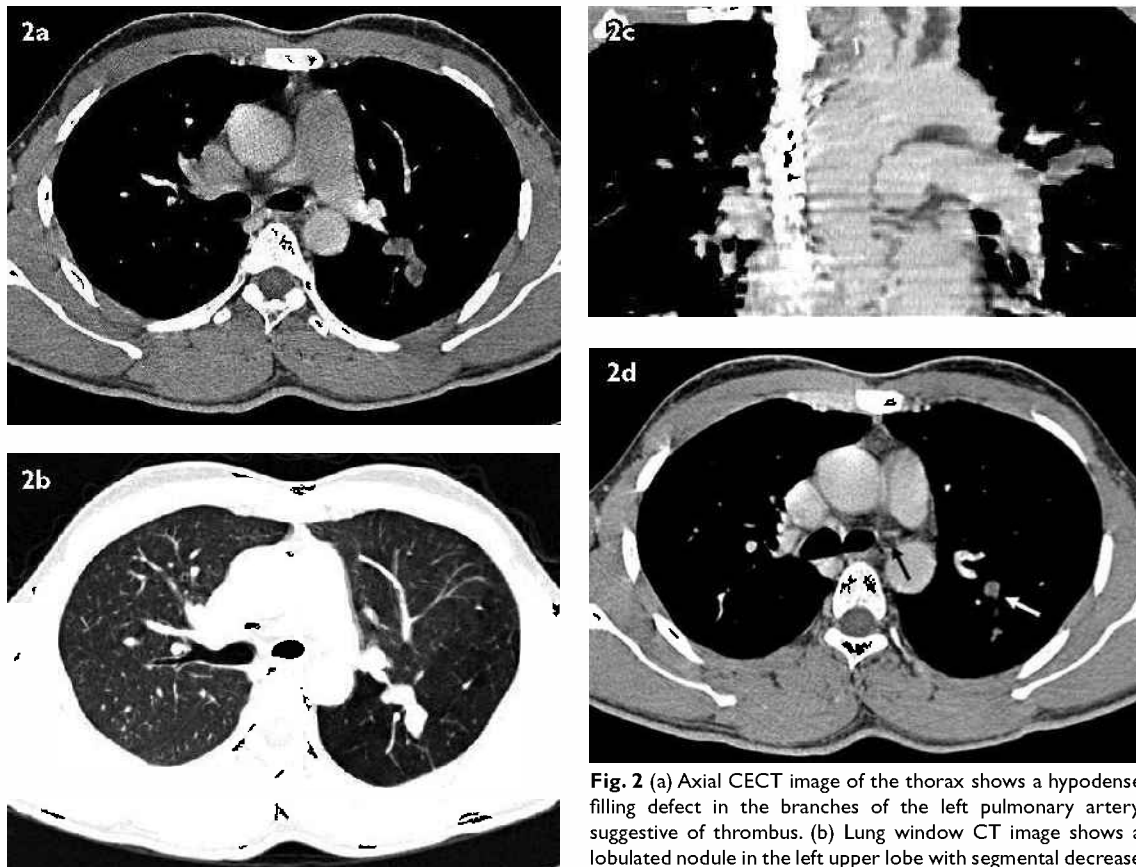
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**Fig. 2** (a) Axial CECT image of the thorax shows a hypodense filling defect in the branches of the left pulmonary artery, suggestive of thrombus. (b) Lung window CT image shows a lobulated nodule in the left upper lobe with segmental decrease in lung vascularity due to thrombus. (c) Coronal multiplanar reconstruction CT image clearly shows the thrombus in the superior branch of the left pulmonary artery. (d) CECT image taken at the cranial level shows a thrombus as a nodular filling defect (white arrow). Hypertrophied bronchial arteries (black arrow) can be seen anterior to the carina.

## DISCUSSION

There is a long list of causes of SPN.<sup>(4)</sup> Neoplastic causes include both malignant and benign neoplasms, such as bronchogenic carcinomas, solitary metastases, sarcomas, carcinoids, lymphomas, connective tissue tumours (e.g. lipomas, fibromas) and neural tumours. Infectious granulomas (e.g. tuberculosis and other bacterial infections, aspergilloma, ascaris, echinococcal cyst, bacterial abscess) and noninfectious granulomas (e.g. rheumatoid arthritis, Wegener's granulomatosis, sarcoidosis, lymphoid granulomatosis, lipid pneumonia, Behçet's disease) can also present as SPNs. Developmental lesions, such as bronchogenic, sequestration and lung cysts, and other conditions, such as haematoma, intrapulmonary lymph node, pseudotumour, amyloidoma, rounded atelectasis, mucoid impaction, progressive massive fibrosis and first costochondral costal junction, are among the other causes. Vascular lesions, which include arteriovenous malformation, pulmonary artery aneurysm and pulmonary infarct, are among the rare causes of SPN.

Previous case reports have described pulmonary infarcts presenting as a SPN, mimicking malignancy<sup>(5)</sup> in the lungs. However, our case was unique, as the pulmonary thrombus itself was seen as a nodule on the

radiograph. This observation has not been previously reported. The clinical importance of this observation is two-fold. Firstly, whenever vascular markings leading toward the nodule are found, a vascular cause should be suspected. Secondly, an observation of thrombus presenting as a SPN adds another differential to the long list of causes of a pulmonary nodule.

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