Hampton's hump, Westermark's sign and Palla's sign in acute pulmonary thromboembolism: a rare concurrence

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DESCRIPTION

A 40-year-old male, non-smoker, presented with cough and right-sided pleuritic chest pain of 10 days and fever of 1-day duration. His previous medical and surgical history was unremarkable. There was no history of significant illness in the family. General physical examination and vital signs were normal. There was no oedema or tenderness of both lower limbs. There were fine inspiratory crepitations over the right infrascapular and infraaxillary areas.

His haemogram showed normocytic normochromic anaemia. The haemoglobin concentration was 94 g/L. There was leucocytosis (total white blood cell count, 11 600/mm³) and raised erythrocyte sedimentation rate (ESR) (75 mm/hour). Chest radiograph (figure 1) revealed a lateral wedge-shaped opacity (Hampton's hump) and a focal area of oligemia in the right lower zone (Westermark's sign), along with a prominent right descending pulmonary artery (Palla's sign).^{1 2} Lower limb Doppler studies revealed near complete thrombosis of right peroneal veins, though D-dimer was normal (2.2 µg/mL). ECG and echocardiography were normal. CT pulmonary angiogram (CTPA) (figure 2) showed a filling defect in the posterior basal segmental artery of the right lower lobe. The

Figure 2 CT pulmonary angiogram showing a filling defect (white arrow) in the posterior basal segmental artery of the right lower lobe.

patient was not willing for further evaluation. We initiated low-molecular weight heparin and bridged it to oral anticoagulants. His symptoms subsided, and he was doing well on follow-up.

There are descriptions of the co-occurrence of Westermark's and Palla's signs, Hampton's hump and Palla's signs, as well as Hampton's hump and Westermark's signs in acute pulmonary thromboembolism (PTE).²⁻⁵ However, to the best of our knowledge, the concurrence of Hampton's hump, Westermark's sign and Palla's sign in the same patient have not been reported. The physicians used chest radiographs as the imaging modality to diagnose PTE until a few decades back. However, with the widespread availability of CTPA, the

Figure 1 Chest radiograph (posterior–anterior view) showing a lateral wedge-shaped opacity (white arrow) in the right lower zone (Hampton's hump), a focal area of oligemia (space between white arrow heads) in the right lower zone (Westermark's sign) and a prominent right descending pulmonary artery (black arrow) (Palla's sign).

Learning points

- ▶ Hampton's hump, Westermark's sign and Palla's signs are radiological signs described in pulmonary thromboembolism (PTE); Hampton's hump indicating pulmonary infarction distal to the thrombus.
- ▶ CT pulmonary angiogram remains the gold standard in the diagnosis of PTE, but it is may not always be feasible due to clinical instability of the patient or renal insufficiency.
- ▶ The various diagnostic modalities like D-dimer estimation and lower limb Doppler studies can often be contradictory and misleading: prompt recognition of radiological signs can aid early confident decision-making.

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importance of chest radiograph in the diagnosis of PTE became less. Though CTPA remains the gold standard in the diagnosis of PTE,⁶ it may not always be feasible to perform it due to clinical instability of the patient or renal insufficiency that precludes the use of contrast agents. Moreover, diagnostic modalities like D-dimer, ECG and lower limb venous Doppler studies may often be contradictory and confusing. In our case, the patient had no definite triggers for a thromboembolic event; clinical scores suggested a low probability of pulmonary embolism and D-dimer was not high. The clinicians relying on conventional guidelines alone, in such scenarios, may end up missing the diagnosis. Hence, a thorough understanding and prompt recognition of these radiological signs can aid early confident diagnosis.

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