Rapid resolution of Westermarck sign following successful thrombolytic therapy with tenecteplase in acute pulmonary embolism

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DESCRIPTION

A 35-year-old man presented with syncope followed by progressive shortness of breath of 6 h duration. The patient was dyspnoic and tachypnoic at presentation; he has tachycardia with blood pressure of 93/51 mm Hg. There was calf swelling with tenderness in the right leg. ECG showed sinus tachycardia with right axis deviation, right ventricular strain as manifested by T wave inversion in precordial leads and prominent S wave in lead I with Q wave and inverted T wave in lead III (S₁, Q₃, T₃ pattern). A chest X-ray showed Westermarck sign with focal area of oligoemia in the right lower lung zone with an abrupt cut-off of the right descending pulmonary artery (figure 1).

A bedside echocardiography showed dilated right atrium and ventricle, systolic pulmonary artery pressure was 50 mm Hg with moderate tricuspid regurgitation. D-dimer levels were markedly elevated at 5.6 mg/L. An urgent CT angiography of the pulmonary artery showed massive pulmonary embolism (PE) obstructing the right pulmonary artery completely and partially occluding the left pulmonary artery (figure 2). The patient was given thrombolytic therapy with intravenous tenecteplase 7000 units' bolus according to the patient's body weight. Anticoagulation was started with enoxaparin, and warfarin was started 24 h later. Doppler ultrasonography of the lower limbs showed deep venous thrombosis of the right leg.

A repeat ECG showed disappearance of S wave in lead I and partial reversal of the acute right ventricular strain and this completely normalised after 1 week. Repeat X-ray of the chest within 24 h of

Figure 2 Axial CT pulmonary angiogram illustrating large filling defect completely obstructing the right lower lobe pulmonary artery and partial filling defect in the left pulmonary artery.

thrombolysis showed normalisation of the pulmonary vasculature on the right side (figure 3). The patient remained well and was discharged on the fifth day after therapeutic international normalised ratio was obtained. Thrombophilic screening was performed, and the results showed protein C deficiency. The patient was advised to be on lifelong oral anticoagulation.

The chest X-ray is abnormal in majority of patients with PE. Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) study¹ showed that atelectasis and focal pulmonary parenchymal abnormalities are the most common X-ray findings in PE. The highly specific findings of focal oligoemia or a peripheral wedge-shaped opacity are

Figure 1 A chest X-ray showing Westermarck sign with focal area of oligoemia in the right lower zone and abrupt cut-off of the right descending pulmonary artery in the lower lobe of the right lung.

Figure 3 A chest X-ray after 24 h of thrombolysis showing resolution of the embolus as shown by normalisation of the pulmonary vasculature on the right side. Note also the decrease in size of the heart compared with previous X-ray.

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rare. The Westermarck sign describes a decrease of vascularisation at the periphery of the lungs due to mechanical obstruction or reflex vasoconstriction in PE.² It is seen in 2–5% of patients with PE. Even though sensitivity is low, this sign is highly specific for the diagnosis of PE.

Learning points

- ▶ The chest X-ray is still helpful in the diagnosis of patients presenting with acute pulmonary embolism (PE).
- ▶ The Westermarck sign is a specific radiological sign which may help in early diagnosis of acute PE.
- ▶ The Westermarck sign describes focal oligoemia of the lung due to mechanical obstruction or reflex vasoconstriction of the lobar pulmonary artery in PE.

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