

45year Old Male Patient with Chest Pain

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Received: June 02, 2017; **Published:** June 13, 2017

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Abstract

Chronic pulmonary emboli are mostly as a partial resolution of acute pulmonary thromboembolism.

Abbreviations: PE: Pulmonary Embolism; CECT: Contrast Enhanced Computerized Tomography; CTPA Computerized Pulmonary Angiography; CT: Computerized Tomography

Investigation

X-ray chest frontal projection

X-ray chest Frontal projection: Enlarged both hila, more on left side and right infra hilar soft tissue opacity. Otherwise lung fields are clear with clear costophrenic angles. Heart size not enlarged.

CT chest with contrast recommended for better evaluation and characterization

Ct with contrast reveals: Axial Images with coronal and sagittal reconstruction with soft tissue and bone window. Diffuse eccentric thickening of bilateral main pulmonary artery of the initial surface, more on right side (post stenotic dilatation) which extends to major lower lobar (inferior) pulmonary arteries, more on right side with luminal narrowing of right main pulmonary artery with patent lumen on both sides. No acute thrombosis. Decreased diameter of distal segmental pulmonary arteries. Calcification of wall of right main pulmonary artery.

Discussion

Majority of acute pulmonary emboli resolve without any residual changes or complications. In few cases acute PE does not resolve and result in obstruction of the pulmonary vascular bed. The result is vascular stenosis, which may lead to severe pulmonary hypertension and cor pulmonale [1]. Presentation of patients with chronic PE could be non-specific, variable or related to complications of acute PE as development of pulmonary hypertension. Chronic thromboembolic pulmonary hypertension often is identified during the diagnostic work-up in patients with unexplained pulmonary hypertension or routine check X-ray or other diagnostic work-up and radiologists must be aware of its radiologic manifestations because it is a treatable cause of pulmonary hypertension in some patients. Incidence of chronic thromboembolic pulmonary hypertension in the general population is not yet clear and may be

underestimated. Recent prospective epidemiologic data indicate an incidence of approximately 4% after acute symptomatic pulmonary thromboembolism. Recently increasing in number of patients undergoing chest computed tomography (CT) who might have complaint of previous episode of pulmonary embolism (either known or unsuspected), incompletely resolved emboli are an increasingly common finding on chest CT images [2,3].

Symptoms are nonspecific and are related to the development of pulmonary hypertension. The vascular involvement is a main predictor of the severity of pulmonary hypertension. In the majority of symptomatic patients, more than 40% of the pulmonary vascular bed is obstructed [4].

Radiographic features

- a. CTPA
- b. Vascular CT signs include
 - c. Direct pulmonary artery signs
 - d. Complete obstruction
 - e. Partial obstruction
 - f. Eccentric thrombus
 - g. Calcified thrombus – calcific pulmonary emboli
 - h. Pulmonary arterial bands/pulmonary arterial webs
 - i. Post stenotic dilatation
 - j. Parenchymal signs (often non-specific on their own): Scars Mosaic perfusion pattern
 - k. Focal ground-glass opacities
 - l. Bronchial anomalies

Differentiation of Acute and Chronic Thromboembolism

Chronic pulmonary thromboembolism is discovered often during CT pulmonary angiography performed to rule out acute PE in a patient who presents with dyspnea or acute chest pain with other relevant clinical laboratory findings. Acute and chronic thromboembolism many time coexist. In cases of acute complete obstruction, the diameter of the pulmonary artery may be more due to impaction of the thrombus by pulsatile flow. On other hand, in chronic thromboembolic disease, the diameter of the vessel beyond to a complete/partial obstruction is significantly/relatively narrowed (Figures 1-3).

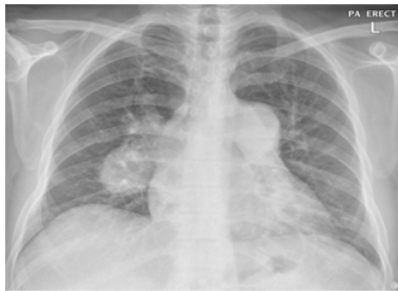


Figure 1: X-ray chest Frontal projection: Enlarged both hila, more on left side and right infra hilar soft tissue opacity. Otherwise lung fields are clear with clear costophrenic angles. Heart size not enlarged.

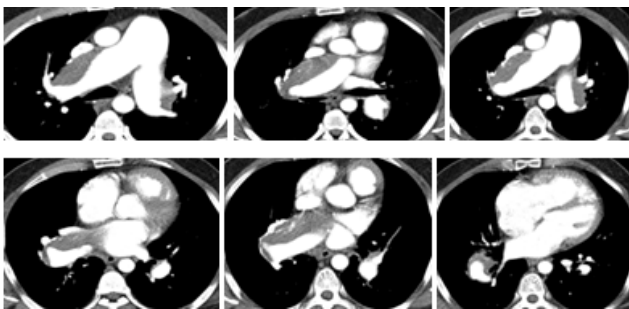


Figure 2: CT Chest with IV contrast Axial Images: Diffuse eccentric thickening of bilateral main pulmonary artery of the intimal surface, more on right side (post stenotic dilatation) which extends to major lower lobar (inferior) pulmonary arteries, more on right side with luminal narrowing of right main pulmonary artery with patent lumen on both sides. No acute thrombosis. Decreased diameter of distal segmental pulmonary arteries.

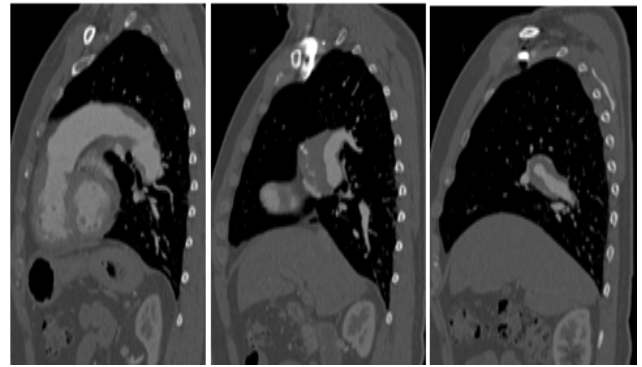


Figure 3: CT Chest with IV contrast sagittal Images in bone window depicts calcification better. Diffuse irregular eccentric thickening of right main pulmonary artery which extends to major lower lobar (inferior) pulmonary arteries, with luminal narrowing of right main pulmonary artery with patent lumen. No acute thrombosis. Peripheral calcification on right side.

Conclusion

Chronic thromboembolic pulmonary hypertension is clearly more common than it was thought previously. It often has been misdiagnosed because patients present with nonspecific symptoms. Awareness of the radiologic imaging features are essential to diagnosed timely. Because chronic thromboembolism is potentially curable, timely diagnosis may reveal better outcome in cases that are treatable. CT and or MR angiography play a key role in diagnosis and helpful for management of chronic thromboembolic pulmonary hypertension.

References

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