Gallium Imaging in Pulmonary Artery Sarcoma
Mimicking Pulmonary Embolism: Case Report

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Primary pulmonary artery sarcoma provides perfusion–ventilation images, as well as arteriographic studies, that can suggest pulmonary embolism. The awareness of atypical correlation among the studies for pulmonary embolism can lead to an early suspicion of pulmonary artery tumor. Imaging with \(^{67}\text{Ga}\)-citrate may facilitate earlier diagnosis.


Primary pulmonary artery neoplasia is a rare entity that mimics the findings of pulmonary embolism in the early clinical course. The following case of pulmonary artery leiomyosarcoma illustrates the opportunity for early diagnosis and surgical intervention. Imaging with \(^{67}\text{Ga}\)-citrate was used, apparently for the first time, to aid in the diagnosis.

CASE REPORT

A 42-year-old white woman presented with left pleuritic pain. During the year before, she had had three similar episodes, one of which included a pleural effusion that was serous, with negative cytology. There was no history of phlebitis and the patient was not on oral contraceptives. Physical examination was noncontributory. Complete blood count, urinalysis, and electrocardiogram were normal. Arterial blood gases revealed a pH of 7.4, pCO\(_2\) of 40, pO\(_2\) 84, and an O\(_2\) saturation of 96.3%. A chest roentgenogram showed relative hyperlucency in the left upper zone and a small pleural reaction at the left base. The cardiac silhouette was normal, and a midthoracic scoliosis convex to the right was present (Fig 1A). Pulmonary perfusion imaging with \(^{99m}\text{Tc}\)-albumin revealed a segmental defect in the left lower zone and poor perfusion in the left upper zone, but a \(^{133}\text{Xe}\) ventilation study was normal. A small defect was also seen at the right base anteriorly (Figs. 2A and 2B). Intravenous pyelography and bilateral venography were normal.

The diagnosis of pulmonary embolism was made and the patient was started on intravenous heparin. Pulmonary angiography, performed because of recurrent symptoms, revealed convex intra-arterial filling defects obstructing the pulmonary artery of the left lower lobe and partially occluding several branches of the left upper lobe artery (Fig. 1B). At this time, studies of the vena cava and both iliac venous systems were normal.

After angiography, the patient was placed on Coumadin and was followed as an outpatient. Followup perfusion images remained unchanged on the left, but an upper lobe pulmonary arteriogram revealed a convex intra-arterial filling defect (arrow). (C) Chest roentgenogram shows two masses in left lung (arrows).

FIG. 1. (A) Chest roentgenogram reveals relative hyperlucency in left upper zone and blunted left costophrenic angle. (B) Pulmonary angiogram shows large convex intra-arterial filling defect (arrow). (C) Chest roentgenogram shows two masses in left lung (arrows).
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myeloma. Such ported genogram; monale. Presented pulmonary sound and pulmonary taken patient unusual in pulmonary artery angiogram, primary pulmonary artery neoplasia, and bronchogenic neoplasm invading the pulmonary artery. A positive $^{67}$Ga-citrate scan at this time was instrumental in indicating malignancy, since none of the clinical signs indicated infected hematoma. Prokop, among others, has found normal $^{67}$Ga images in patients with clinically proven hematomas that were not infected (personal communication, 1976). Thoracotomy was undertaken when the densities rapidly increased in size.

We wonder whether $^{67}$Ga-citrate imaging would have been positive in our patient at the time when the tumor appeared to be entirely within the lumen of the left pulmonary artery. Mori et al. studied $^{67}$Ga accumulation relative to cell types and noted 100% (3/3) positivity in fibro- and myosarcomas (6). Mishkin et al. found no $^{67}$Ga uptake in five angiographically proven cases of pulmonary embolism (7).

In a recent study, Siemsen et al. reported that $^{67}$Ga-citrate imaging was positive in 88% (109/124) of thoracic lymphomas, 85% (60/71) of pulmonary carcinomas, and 100% (6/6) of pulmonary abscesses. Pulmonary embolism and hematoma were not included in their study of 575 cases. Siemsen et al. state that the gallium study may be positive before the chest roentgenogram, and that lesions over 2 cm in diameter may show uptake (8).

Thus, $^{67}$Ga-citrate imaging appears to have great potential in differentiating primary or secondary pulmonary artery tumor from pulmonary embolus. Gallium imaging is recommended in cases with the presumed diagnosis of pulmonary embolus whenever a clinical finding or a pulmonary perfusion study is atypical.
REFERENCES


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