Extremely Rapid Resolution of a Pulmonary Embolus*
Report of a Case

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Spontaneous resolution of acute pulmonary emboli, documented by pulmonary arteriograms, has been previously reported.\(^4\) The interval between diagnosis and resolution has varied, but the earliest previously reported was seven days.\(^3\) In the case to be reported, resolution of one embolus occurred in 30 hours.

Case Report

A 64-year-old housewife was admitted to the hospital on April 6, 1966, following a fall which resulted in a severely comminuted intertrochanteric fracture of the left hip. She was treated by open reduction and internal fixation on April 7, 1966. Her postoperative course was uneventful until the evening of April 16, 1966, when she experienced sudden onset of right-sided pleuritic chest pain with associated apprehension, dyspnea and diaphoresis. Her temperature was slightly elevated to 100.6°F.; however, the blood pressure and pulse remained normal. Auscultation of the chest revealed right-sided pleural friction sound.

A roentgenogram of the chest revealed a small right-sided pleural effusion. The electrocardiogram demonstrated minor non-specific ST segment and T wave changes.

Pulmonary embolism was suspected, and pulmonary arteriogram confirmed the presence of multiple pulmonary thromboemboli as demonstrated in Fig. 1. The catheter was left in place and the patient treated with intravenous sodium heparin 50 mg every four hours. Three additional pulmonary arteriograms were done at 30, 39 and 76 hours respectively (Fig. 2, 3 and 4). The most striking finding is the resolution of the embolus in the pulmonary artery to the right lower lobe in 30 hours. Of equal importance is the fact that while one embolus resolved, other emboli in the same environment did not.

The patient was continued on anticoagulant therapy, utilizing sodium heparin for ten days, followed by sodium warfarin for the remaining period of hospitalization. At the time of discharge, 38 days after admission, she had no cardiorespiratory symptoms.

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Figure 1: Initial pulmonary arteriogram done at 2:00 a.m. on April 17, 1966. Arrow 1—occlusion of pulmonary artery to basilar segments of right lower lobe. Arrow 2—small saddle embolus at bifurcation of right main pulmonary artery. Arrow 3—occlusion of tertiary branch of pulmonary artery in first division of vessel to right upper lobe.
FIGURE 2: Second pulmonary arteriogram done 30 hours following initial study. Arrow 1—near complete resolution of embolus in pulmonary artery to right lower lobe. Tertiary branch distal to original embolus still occluded. Arrow 2—embolus at bifurcation of right main pulmonary artery unchanged but more apparent. Arrow 3—embolus unchanged. Arrow 4—embolus in pulmonary artery to right middle lobe now apparent because of less rotation.

COMMENTS

This case report presents angiographic evidence that resolution of a pulmonary embolus can occur in 30 hours. It also demonstrates that other emboli in the same patient, in the same lung, do not resolve in the same period of time. What then accounts for this difference? Although it is impossible to present scientific proof for this phenomenon, it may be profitable to speculate. Because each of the emboli are essentially in the same environment, the difference in their behavior is most likely due to differences in their respective composition. This difference is most likely due to variations in their maturity or degree of organization.

The least organized embolus, such as a fresh fibrin clot, would be the most susceptible to lysis. The problem then in pre-

dicting speed of resolution depends upon knowing the age or degree of organization of the individual embolus. While the episode of embolization to the lung can be fairly accurately documented, the onset of peripheral thrombus is insidious, and it is this event which determines the amount of organization of the embolus. In the case presented, the embolus which resolved first was either the least organized of the venous thrombus to embolize, or the most recent embolus. Fortunately, it is usually the least mature portion of the thrombus which embolizes.

Spontaneous lysis of pulmonary thromboemboli depends not only on the degree of organization of the embolus, but also on the level of activity of the intrinsic fibrinolytic system, which varies with a great variety of known and unknown factors. It may be that individuals with high levels of intrinsic fibrinolytic activity do not suffer from pulmonary emboli. It is then interesting to speculate that if the fibrinolytic system could be stimulated when the patients are in need of protection, many pulmonary emboli might be prevented. The basic pathology of this disease may be directly related to the intrinsic fibrinolytic system.

It is most likely that the vast majority of acute pulmonary emboli spontaneously resolve in varying periods of time. If it were otherwise, we should be deluged with patients suffering from pulmonary insufficiency secondary to this disease which has been reported as the most common pulmonary disease in the hospitalized patient. Any agents which would hasten this natural process of resolution would, of course, be quite helpful.

References


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