

PULMONARY EDEMA AFTER RAPID TRANSFUSION OF FFP

A case history by Jim Perkins, M.D. (© 2009)

The beginning of the story

An 82 year old woman who was on warfarin for atrial fibrillation and history of stroke was visiting her daughter in a state bordering her own. Her primary physician sent her to a laboratory to have her prothrombin time (PT) monitored. The INR was 11.06, but the result did not get faxed to the physician because the laboratory was in the process of installing a new computer system. Two weeks after the test, the patient's husband called the physician with the result, and she told him to take the patient to the nearest emergency room for a repeat evaluation of her PT/INR.

Past Medical History

The patient had adult onset diabetes mellitus, being treated with a low dose of insulin and multiple oral hypoglycemic agents. Compliance and glucose control were not optimal. Two cataracts had been removed, and her renal function was abnormal (creatinine = 1.2mg/dL, normal 0.5-1.0; albuminuria).

Cardiovascular problems included longstanding hypertension and atrial fibrillation. She was on digoxin for control of her heart rate. The stroke at age 74 had left no residual neurologic deficits. The patient had a myocardial infarction at age 80 and at age 81 was admitted to the hospital with acute pulmonary edema due to congestive heart failure (CHF) and developed respiratory failure requiring 24 hours of ventilation. Her ejection fraction was 25%.

Course

In the emergency room of the local hospital she was noted to have no evidence of bleeding. Her lungs were clear and her cardiac examination was normal, except for distant heart sounds. Her PT was 102.5 (INR 9.6). The patient was admitted to the hospital under the care of a local physician, who consulted with the emergency room doctor by telephone.

Two units of Fresh Frozen Plasma (FFP) were ordered.

Question:

1. Is FFP indicated for this patient? Is there anything else you might want to do for the patient?

The patient was admitted at 18:26. At 20:50 verbal orders were entered for 2 units of FFP and an order was placed for the prothrombin time to be repeated in the morning. No vitamin K was ordered.

The first unit of FFP was started at 23:10 and finished at 23:40. No change in vital signs or other adverse reaction was noted. The second unit was started at 23:45 and completed at 00:35. Again there was no significant change in vital signs. The units weighed 360 gm each. Her IV fluid rate was 25mL/hr.

At 01:20, the patient complained of anxiety and chest pain, and the nurse noted her to be short of breath with pale, cool, and clammy skin. Auscultation revealed “wheezy and wet” lungs throughout all lobes. Oxygen saturation was 88-89% on room air. The patient was tachycardic at 100, up from 64/min at the end of the transfusion, but the blood pressure and temperature were unchanged at 102/62 and 97.2 respectively. The physician was called. She placed a voice order for furosemide, 40mg IVP, oxygen, and albuterol.

At 01:30 the patient was noted to be unresponsive to verbal and painful stimuli, with minimal respiratory effort and frothy white sputum at the mouth. Resuscitation was initiated, and she was intubated.

A portable chest x-ray performed at 01:45 demonstrated diffuse bilateral pulmonary infiltrates.

Question:

2. What is the differential diagnosis of this transfusion reaction? Are there any laboratory values which could help make a diagnosis?

A prothrombin time on a blood sample taken at 01:55 was 22.7 seconds (INR= 2.12). The WBC count was 8,900/ μ L.

The patient transferred to the intensive care unit and a full resuscitation was initially attempted, including multiple countershocks for what appeared to be ventricular tachycardia. However, the family requested that the resuscitation be stopped, based on the patient’s wishes expressed after the previous episode of pulmonary edema. Therefore further resuscitation was discontinued, and the patient was extubated at 02:46. She was pronounced dead at 02:50.

An autopsy demonstrated pulmonary edema, intra-alveolar hemosiderin-laden macrophages, severe coronary artery disease with patchy myocardial fibrosis, and arteriolonephrosclerosis. The microscopic description of the lung mentions that there is no evidence of pneumonia. The pathologist’s impression of the cause of death was pulmonary edema due to iatrogenic fluid overload with the FFP contributing.

Question:

3. In view of this new data would you change your answer to either of the previous questions? What is your diagnostic impression?