HEMOLYSIS AFTER PLATELET TRANSFUSION

Case Study by Jim Perkins, M.D. (© 2009)

A 67 year old woman with a 10 month history of multiple myeloma had been in the hospital for a month with pseudomonas pneumonia and sepsis, complicated by respiratory failure. She had a history of malignant pericardial effusion, renal failure, and hypercalcemia. Treatment this hospitalization had included multiple antibiotics (tobramycin and ceftazidine), 2 weeks of mechanical ventilation, parenteral nutrition, and multiple blood products, including 11 units of RBCs, 8 units of apheresis platelets ("single-donor platelets"), and 2 units of FFP.

Two weeks after extubation the patient developed a severe fungal tracheitis and was re-intubated for upper airway obstruction. Ceftazidine was discontinued. Tracheotomy was performed, amphotericin was started, and a biopsy of her tracheal pseudomembrane was scheduled. Because the patient had a platelet count of 24,000, the procedure was to be preceded the night before by transfusion of 2 units of single-donor platelets.

The patient was group A, Rh(D) negative with a history of anti-D which was no longer detectable. The first unit of platelets was group O, Rh negative; it was started at approximately 2100 and was completed without incident. The second unit of platelets was group A, Rh negative and was started at approximately 2300.

Within 15 minutes of the start of her second platelet transfusion, the patient developed a rigor, and her temperature rose from 98 to 99^0F. The transfusion was stopped and a transfusion reaction was reported.

Transfusion reaction workup confirmed that the patient was group A and the platelet units had blood types as labeled (1^{st} unit group O, 2^{nd} group A). The plasma was red and the DAT had increased in strength as follows:

	Polyspecific AHG	anti-IgG	anti-C3
Pre-	1+	w+	0
Post-	2+	2+	0

An eluate contained anti-A, and free anti-A could be demonstrated in the serum. Culture of the group A platelet unit, during the transfusion of which the reaction had occurred, was negative; the bag from the first unit of platelets was not available for culture. Review of the previous transfusions indicated that the patient had also received group O single-donor platelets 3 days and 2 days before the reaction. The unit of group O platelets had been drawn at a blood center in Florida. The blood center was contacted and asked to perform anti-A titers on the donor's "pilot" sample. These are shown below:

	Test phase		
	IS	RT, 30"	37^o, 30"
Titer	128	512	256

Three days after the reaction a patient blood specimen was sent to the Blood Center of Wisconsin to investigate the possibility of a ceftazidine/RBC antibody; this was ruled out.

The course of some pertinent laboratory values is shown in the next table:

Day	Time	Hgb/Hct	Plts	Tbili/ Dbili	LDH	BUN/Cr
Admission		8.7/24.6	16,000	0.4/0.3	273	45/2.1
-4			15,000	1.1/0.6	412	57/1.9
-3	1719	Transfused group O platelets				
-2	1023	Transfused group O platelets				
0 (reaction)	0613	9.5/26.9	24,000			56/1.8
	2100	Transfused group O platelets				
	2300	Group A platelets started; interrupted by reaction				
+1	0042		60,000			
	0558	6.7/19.5	43,000	7.1/4.8	1414	70/1.3
	1147	6.8/18.9	45,000			
	Transfused 2U A-neg RBCs					
+2	0553	9.4/27	30,000	5.7/4.3	1285	80/1.7
+3	0536	6.9/19.1	18,000			
	No evidence of ceftazidine/RBC antibody (BCW reference lab)					
	Transfused 2U A-neg platelets					
+4	0959	7.5/21.3	91,000	13.8/9.1		135/1.8
	Transfused 2U O-neg RBCs					
+5	0606	7.3/20.3	52,000	10.5/8.5	561	142/1.8
+6	0533	6.5/18.3	26,000	5.6/3.9	459	134/1.9
	Transfused 2U O-neg RBCs					
+8	0824	6.9/20.1	10,000	3.0/2.1	406	122/2.1

The patient recovered from this episode without apparent morbidity but died weeks later of her multiple medical problems.

Study Questions

1. What manifestations of a transfusion reaction were seen in this case?

2. What is the differential diagnosis?

3. Why did the reaction occur while the compatible unit was being given?