

## HEMOLYSIS AFTER PLATELET TRANSFUSION: ANSWERS

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

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

*This patient developed fever and a shaking chill (“rigor”) soon after initiation of the transfusion of the second of two units of platelets. The direct antiglobulin test increased in strength and hemoglobinemia was noted in the patient’s plasma. The hemoglobin level dropped from 9.5 to 6.7 gm/dL, and there was an increase in the bilirubin and LDH levels.*

2. What is the differential diagnosis?

*Fever with or without a rigor occurring during or soon after transfusion is most often due to the patient’s underlying medical problems or to a febrile non-hemolytic transfusion reaction (FNHTR). FNHTRs are caused by the interaction of donor WBCs with recipient antibodies directed against them, or by cytokines that are released from donor leukocytes into the plasma/anticoagulant supernatant during storage. Less common causes of fever at the time of transfusion include hemolytic transfusion reactions (HTRs), bacterial contamination of a blood component, and transfusion-related acute lung injury (TRALI).*

*There were multiple indications that this patient experienced an immediate HTR. Because of the rarity of so-called “minor side” hemolysis due to the anti-A in a platelet donor’s plasma it was thought possible that the patient had a FNHTR and concurrent drug-induced hemolytic anemia. Therefore, a study was done to rule out a ceftazidime/RBC antibody. Anytime a transfusion reaction is suspected it’s important to consider the possibility that the presenting manifestations have some other cause other than the transfusion.*

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

*When a reaction occurs during a transfusion of multiple units it is important to consider whether the reaction may in fact be due to a preceding unit or units. Fever is thought to be due to cytokine generation/release in both anti-HLA-mediated FNHTRs and in HTRs. It takes time both for the cytokine level to increase and then for the body to respond to the increased levels of inflammatory cytokines by raising the temperature set point. Thus there is typically a delay between initiation of the transfusion and development of fever. In this case the delay was sufficient for completion of the offending unit and initiation of the second.*