

HEMOGLOBINURIA IN THE OPERATING ROOM
Case Study by Jim Perkins, M.D. (©2009)

R.W. was a 10 month old boy with hydrocephalus having cranioplasty. The blood bank received a call from the anesthesiologist, who related that the patient had started passing red urine soon after starting a transfusion. The patient had received 30mL of RBCs from a 70 mL aliquot, and had a slight increase in temperature to 100°F. The anesthesiologist asked what he should do.

1. What directions should you give to the anesthesiologist at this point?

The anesthesiologist was asked to perform an immediate clerical check on the unit. He was also asked to return to the blood bank both the transfused unit and the second aliquot from the same unit, maintained in the temperature controlled cooler. Finally, a post-transfusion blood sample and a urine sample were requested.

2. What tests should be performed now?

The blood bag (a pediatric transfer bag) was returned without attached fluids. There were no clerical errors noted in the blood bank. The urine was red; urinalysis yielded the following results:

- 2+ protein
- 3+ occult blood
- + nitrate
- 0-5 RBCs/hpf

The post-transfusion plasma was cherry red. The DAT on the post-transfusion patient RBCs was negative. Repeat typing of the patient and unit confirmed that both were group O, and repeat antibody screens and crossmatches were negative.

3. What do you think is going on here? Is there any further investigation that should be done?

An aliquot was removed from the unit, diluted with saline, centrifuged, and examined for hemolysis. Gross hemolysis was present in the partially transfused unit, although the hematocrit was not markedly lower than expected.

4. What would you do now?

A visit to the operating room revealed that the unit had been warmed by placing it in a beaker of hot tap water. The temperature of the water from the tap was later checked and found to be 57°C. A standard blood warmer was standing next to the operating table.

The method of infusion was also discussed. Aliquots had been withdrawn from the unit into a syringe and infused through the "piggyback" connector on the patients IV through a 22 gauge needle. The IV line was also 22 gauge. The line contained normal saline.

5. What therapy would you suggest?

Surgery was stopped. Saline was given at one and one half times the maintenance rate which resulted in a good urine output. Furosemide was also administered.

Postoperative laboratory data:

BUN/Creat = 7/0.6

Hematocrit = 25

The urine became progressively lighter over the course of the night and appeared clear by the next morning, but it still registered 3+ for occult blood by urine "dipstick".

A blood count on the first post-operative day revealed a hematocrit of 20. A urinalysis later in the day revealed 1+ occult blood.

6. Why might the hematocrit have continued to drop?