

Transfusion Reactions

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### Case 1

An 88 year-old group O+ man with chronic lymphocytic leukemia (CLL) presented to ER with a 2d history of weakness, oliguria, and chills.

He has a history HTN, CAD, and CHF;

His outpatient medications are ASA, furosemide, ramipril, & metoprolol.

In ER, BP is 92/60. He is given 1L NS, antibiotics, and antipyretics.

His diuretic and antihypertensives are held.

CBC shows Hb 79 g/L; one month prior his Hb was 100 g/L.

2 units RBC were ordered, each to be given over 1h. A 21 day old unit is hung.

Pre-transfusion      HR 121, BP 100/60, T 37.3 O<sub>2</sub> sat 100% R/A

After 1st unit:      HR 140, BP 127/72, T 37.3 O<sub>2</sub> sat 78% R/A;

→97% on 2L/min NP.

The 2<sup>nd</sup> unit is cancelled.

His JVP is at the angle of the jaw, his chest fields have crackles, and bipedal pitting edema is up to the knees. CXR shows bilateral infiltrates with cardiomegaly, in keeping with pulmonary edema.

1. Which of the following might have been his *best defense* against TACO?
  - A. Fresh (<14 day old) RBC
  - B. Pre-transfusion furosemide
  - C. CLL treatment to recanalize obstructed pulmonary lymphatics
  - D. Slower administration of the unit (over 3-4h instead of 1h)
2. Which one of the following is true of TACO?
  - A. An RBC unit is more "TACO-genic" than a platelet transfusion
  - B. Fever with a suspected TACO argues for another diagnosis
  - C. It is the 2<sup>nd</sup> commonest cause of transfusion-related death
  - D. It is the 2<sup>nd</sup> commonest cause of respiratory transfusion reactions

## Case 2

You are called to the hematology ward to review an 87 year old woman admitted with febrile neutropenia after myeloma therapy. She is a grand multipara (G8) with hypertension.

She experienced fevers, rigors, and tachycardia following a 7-day-old platelet transfusion.

	Pre-transfusion	Post-transfusion
HR	75	110
BP	104/62	130/80
Temp	37.3°C	39.9 °C
RR	16	30
SpO2	98% (room air)	95% (room air)

Labs:

Pre-transfusion: Hb 68, WBC 0.2, platelets <10

Patient blood group A, RHD positive

Platelets transfused: Group O, day 7, single donor apheresis collection

3. Which one of the following is indicated at this time for investigation and management of this patient?
- repeat CBC, LDH, creatinine, PT/aPTT, and urinalysis
  - review chart (temperature trends, antibiotics, cultures)
  - repeat G&S, do DAT, culture patient & residual product
  - no investigation needed; already admitted with febrile condition

Repeat blood group, IAT, and DAT all negative.

Repeat CBC was unchanged.

LDH, bilirubin, and haptoglobin were all within normal limits.

The product and the patient's cultures were all negative.

Review of her chart reveals that she presented with fever 4 days ago and was started on piperacillin/tazobactam. She defervesced over the last 2 days.

4. Which one of the following is recommended to prevent future febrile reactions in this patient?
- plasma volume reduction (PVR) of platelet products
  - pre-medication with acetaminophen
  - washing of RBC and platelet cellular products
  - no interventions recommended

### Case 3

An athletic 17 year old male with ALL is undergoing induction chemotherapy (day 3 of the Dana Farber protocol, with no infusion reactions yet).

His CBC today shows WBC 0.4, plt <10, Hb 69.  
He is ordered 1 adult dose of platelets and 1u RBC.

The platelet transfusion is completed and the RBC unit is hung.  
After 100mL of RBC have been transfused, the patient becomes febrile, dyspneic, tachypneic, and his spO2 drops to 78% on room air.

The transfusion is stopped and he transfers to the ICU.  
He is given furosemide and salbutamol with no effect, and requires intubation.  
CXR shows new bilateral infiltrates.

5. Which one of the following is the most likely diagnosis?
  - A. type 1 (“definite”) TRALI
  - B. type 2 (“possible”) TRALI
  - C. chemotherapy-related ARDS
  - D. atypical pneumonia due to immune compromise
  
6. The patient’s parents are upset and want to know why this happened and what can be done to prevent it from happening again.
  - A. IVIG and steroid will mitigate recurrence risk
  - B. irradiation of cellular products prevents TRALI
  - C. antihistamine, acetaminophen, and furosemide reduce severity
  - D. supportive care is mainstay; most recover within 48-96 hours
  
7. Based on what is known about TRALI, which of the following is the strongest measure by which to protect other recipients?
  - A. placing an alert in the patient’s allergy profile
  - B. reporting the suspected TRALI to blood bank
  - C. launching an incident report
  - D. informing the Transfusion Transmitted Injuries Surveillance System (TTISS)

## Case 4

A 52 year old male was in the OR for a 4-vessel CABG.

He received a 400mg dose of protamine at 17:15,  
then 1 dose of platelets, 2u FP, and 1u RBC.

As he was coming off bypass pump, he developed an extensive urticarial rash (75% TBSA) with shock (BP 70-80/40) and bradycardia (20-80).

He had no known history of allergies and no prior exposures to blood products.

He was bolused phenylephrine 40 mcg IV with dopamine at 3 mcg/kg/min IV & norepinephrine at 0.1 mcg/kg/min IV.

He was also given diphenhydramine 50 mg IV + hydrocortisone 100 mg IV.

There were no respiratory/oxygenation changes, with P/F ratio remaining >300 with FiO<sub>2</sub> 30 – 50% during mechanical ventilation, which was continued, as he had significant airway and peri-orbital angioedema.

On transfer to the CVICU at 19:15, he was hypothermic (33.1C), and required ongoing boluses, pressors, and inotropes for a period of 12h.

8. Which one of the following investigations yields a result most likely to guide future transfusion advice to the patient?
- A. CBC, PT, aPTT, fibrinogen
  - B. culture patient and blood products
  - C. baseline IgA level and presence of anti-IgA IgG
  - D. repeat blood group, IAT, and DAT

He recovers and is extubated on POD1.

He is discharged home on POD7 after an uneventful post-operative course.

Laboratory testing reveals evidence of IgA deficiency (on a pre-transfusion specimen) and post-reaction detection of anti-IgA IgG in the patient's serum.

Two years later he is back, needing a hip replacement.

9. Which strategy would you adopt for this case?
- A. cancel surgery
  - B. bloodless surgery
  - C. fractionated blood substitutes
  - D. stock 2u washed RBC ± 4u IgA-deficient donor FP

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