Transfusion Camp 2023-2024
Day 3: Seminar 3A
"Patient Blood Management", developed by Dr. Charles Lafrance & Dr. Yulia Lin

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Case 1 (15 minutes)

A 64-year-old woman is being seen in preoperative clinic in preparation for an elective revision total hip arthroplasty (2022 ONTraC provincial transfusion rate 16%). She has been feeling fatigued over the past 6 months. She attributes this to her worsening hip pain. Her past medical history is significant for hypertension. Her current medications include ASA and Ramipril. Her weight is 80 kg. Her labs show the following: hemoglobin 95 g/L, MCV 75 fL, WBC 6.5 x 10^9/L, platelets 425 x 10^9/L. Her creatinine is 80 µmol/L. Her ferritin is 20 mcg/L. The surgeon has a spot for the surgery next week.

1. Which one of the following tests is indicated to investigate the cause of her anemia?
   A) GI workup including colonoscopy
   B) Hemoglobin electrophoresis
   C) Serum protein electrophoresis
   D) Vitamin B12

2. Which one of the following is the appropriate next step in her management?
   A) Delay surgery until investigations complete
   B) Delay surgery until patient iron replete
   C) Proceed with surgery next week, no interventions needed
   D) Proceed with surgery next week, start iron supplementation this week

3. Knowing that her surgery will be in the next week to 4 weeks, which one of the following is an appropriate treatment for her anemia?
   A) Feramax 150mg po OD
   B) Ferrous fumarate 300 mg po OD
   C) IV iron 300-500mg
   D) IV iron 1000-1200mg

Case 2 (15 minutes)

A 80-year-old woman (weight 65 kg) is being seen in the surgeon's office in preparation for aortic valve replacement surgery (2022 ONTraC provincial transfusion rate for elective aortic valve surgery 27%). She presented with shortness of breath on climbing 2 flights of stairs over the past three months. Her past medical history is significant for Type 2 diabetes, hypertension and hypercholesterolemia. She also had breast cancer 7 years ago for which she had surgery and radiation. She was treated for adjuvant endocrine therapy with anastrozole for five years. Her most recent angiogram did not show significant coronary artery disease. Her current medications include ASA, metformin, insulin, ramipril, furosemide, and rosuvastatin. On exam, her vitals are stable with BP 110/70. Her physical exam is unremarkable. Her labs show the following: hemoglobin 98 g/L, MCV 103 fl, WBC 9.3 x 10^9/L, platelets 250 x 10^9/L. Her creatinine is 150 µmol/L. The family doctor states that her hemoglobin has been stable at about 100 g/L for the past 2 years. The surgeon has booked her for surgery in 3 weeks.

4. Which one of the following tests would you recommend for investigation of her anemia?
   A) B12
   B) Ferritin
   C) Hemoglobin electrophoresis
   D) Transferrin saturation

5. Which one of the following is the next best step for her surgery?
   A) Consult GI for endoscopy
   B) Delay surgery until results of bone marrow biopsy known
   C) Delay surgery until patient's anemia is optimized.
   D) Optimize anemia and proceed with surgery as planned in 3 weeks.

6. Which one of the following is the best treatment for this patient's anemia?
   A) Eprex 40,000 units s.c. weekly x 3 weeks
   B) Ferrous gluconate 300 mg po OD x 3 weeks
   C) IV iron 1000-1200 mg
   D) No intervention prior to the surgery

Case 3 (20 minutes)

A 55 year old woman originally from India presents to the preoperative clinic for bilateral knee surgery (2022 ONTraC provincial transfusion rate 0%) booked in one week. Her hemoglobin is 115 g/L, MCV 85 fL, WBC 5.5 x 10^9/L, platelets 250 x 10^9/L. Her creatinine is 70 µmol/L. Her ferritin is 40 mcg/L. Her surgeon has started her on oral iron supplementation. When speaking to her, she states that in her work-up a couple of months ago for a minor surgery, she was found to have a very rare blood type. She hands you a card that she carries in her wallet that states that she has Bombay type blood. You call the blood bank to find out that Bombay type blood is an extremely rare blood type. In fact, these patients can only receive Bombay type blood. The blood bank informs you that Canadian Blood Services only has 14 frozen red blood cell units of Bombay type in their inventory.

7. Which one of the following is an appropriate management strategy for this patient?
   A) Call the Transfusion Medicine specialist at your hospital
   B) Delay the surgery to enable patient to donate 2 units of autologous PRBCs
   C) Obtain 4 units of frozen Bombay type RBCs from CBS, thaw and bring to hospital and proceed with surgery as booked
   D) Proceed with surgery

8. Which one of the following intra-operative blood conservation strategies is indicated in this case?
   A) Acute normovolemic hemodilution
   B) Intra-operative cell-saver use
   C) Perioperative tranexamic acid
   D) Transfuse plasma and rFVIIa if any bleeding encountered

9. Which one of the following is an appropriate post-operative plan for the patient?
   A) Continue oral iron supplementation
   B) Give ESAs if symptoms of anemia
   C) Minimize unnecessary phlebotomy
   D) Transfuse frozen Bombay type unit if Hgb < 80 g/L

Case 4 (20 minutes)

A 14 year old boy is admitted after being hit by a car while riding his bike. He has significant abdominal and orthopedic injuries. His family was present at the scene and advised the health care providers that the patient and the family are Jehovah's Witnesses. The patient has undergone surgery with hemodynamic resuscitation with 3-4 L of crystalloids. His labs show the following: hemoglobin 45 g/L, WBC 8.0 x 10^9/L, platelets 65 x 10^9/L. His INR is 1.5, PTT is 40 seconds. It is suspected that his laboratory values are both secondary to the acute coagulopathy of trauma and dilutional.

10. Which one of the following is an appropriate post-operative order for this patient?
    A) CBC, INR, aPTT Q8H until normalized
    B) CBC, INR, aPTT, chemistry panel daily
    C) CBC, INR, aPTT, chemistry panel every 2 days
    D) No follow up laboratory testing unless clinically indicated.

11. Which one of the following is an appropriate post-operative order for this patient?
    A) epoietin alfa 20,000 units daily x 5 days then reassess CBC
    B) epoietin alfa 20,000 units daily x 10 days, CBC daily
    C) epoietin alfa 20,000 units daily until discharge home
    D) epoietin alfa 20,000 units daily until Hgb >120 g/L

The patient has now been extubated and is awake. The clinical team feel strongly that this patient should be transfused. The parents state that he is a Jehovah's Witness and would not want him to be transfused, even in a life-threatening situation.

12. Which one of the following is appropriate when discussing transfusion with the patient and family?
    A) Ask them to speak with their Jehovah's Witness medical liaison so they can receive instruction about what their congregation dictates is acceptable.
    B) Determine the patient's decision-making capacity and wishes; then within your jurisdiction and hospital policy, determine how best to proceed.
    C) Give them a list of all the non-cellular blood products available from CBS and ask them which of them they would accept for transfusion.
    D) Given the medicolegal risks in this case ask that the hospital ethicist and risk management team be present at all meetings with the parents.