

Transfusion Medicine Boot Camp for Non-Physician Prescribers

Materials based on Transfusion Camp 2017-2018 with permission from Dr. Yulia Lin and TM Boot Camp Medical Staff

Morning Seminar on Day 3

Bleeding Assessment and Anticoagulants/Antiplatelets

Case 1

You are seeing a 37 year old woman for elective breast reduction surgery. Her past medical history is as follows: 1) tonsillectomy age 7: required return to OR at 24 hours for surgical hemostasis and 1 unit transfusion PRBCs; 2) G3A1L2: prolonged bleeding following spontaneous pregnancy loss at 13 weeks and required D&C and 2 units PRBC transfusion; and 2 uncomplicated C sections. Her current medications: daily multivitamin.

You are concerned about the bleeding that she has had with previous procedures.

1. Which one of the following is the appropriate next step in investigation for a possible bleeding disorder?
 - A. Check labs: INR, aPTT, CBC
 - B. Take more thorough history of bleeding symptoms
 - C. Ask about family history of bleeding disorders
 - D. Check labs: FVIII, FIX

Further history reveals that she has never had dental extraction. She has had menorrhagia since menarche, symptoms improved with OCP but she is previously iron deficient. She endorses easy bruising. Her mother had similar problems.

2. Which one of the following is the appropriate next step in patient management?
 - A. Book OR, note need for careful surgical hemostasis
 - B. Check labs: FVIII, FIX
 - C. Refer to a hematologist
 - D. Check labs: CBC, INR, aPTT

The patient is seen by a hematologist who uses a validated bleeding assessment tool (BAT) to assess the patient's bleeding phenotype. The patient's score on the BAT indicates that she likely has a bleeding disorder. Initial laboratory investigations reveal the following:

- CBC within normal limits
 - INR, aPTT within normal limits
 - Von Willebrand Factor antigen 0.28 u/mL (N=0.45-1.80)
 - Von Willebrand Factor activity 0.30 u/mL (N=0.45-1.80)
 - FVIII 0.45 u/mL (N=0.5-1.49)
3. Given the patient's history and lab findings are consistent with von Willebrand's disease, why did she not experience bleeding with her two Cesarean sections?
 - A. The obstetrician was very careful about surgical hemostasis because of her bleeding history
 - B. Von Willebrand Factor levels are hormone-responsive and increase with pregnancy and use of hormone-containing medications

- C. Ceasarean sections are low risk for bleeding surgeries and excessive hemorrhage would not be expected even in a patient with a bleeding disorder
 - D. Women are routinely treated with DDAVP prior to operative deliveries and this medication is known to increase levels of von Willebrand factor
4. Following consultation with the hematologist, the patient still wishes to proceed with breast reduction surgery. Which one of the following is true about peri-operative management of this patient?
- A. According to international guidelines, her surgery should be done early in the day and early in the week
 - B. She will need factor concentrate infused before surgery, but will not require further therapy post-operatively
 - C. National and international guidelines indicate that as long as the hematologist's recommendations are followed the patient can be operated on in the surgeon's private OR
 - D. Given that her von Willebrand factor levels and FVIII levels are both decreased, she will require factor replacement with two different products

Case 2

An 82 year old female is scheduled for semi-urgent neurosurgery for resection of a meningioma. Pre-operative testing shows APTT is >110 seconds (N= 26 to 35 seconds). Her INR is 0.9 and CBC is normal.

- 5) Which one of the following represents an appropriate approach to initial investigation?
- A. Check factor levels VIII, IX, XI, and vWF
 - B. Take complete history including bleeding history and drug history
 - C. Repeat testing to confirm findings
 - D. Order peri-op plasma transfusion, no further investigation needed

The patient has an extensive surgical history including previous appendectomy, cholecystectomy, hysterectomy and bilateral knee repairs. She has had 3 normal pregnancies with uncomplicated vaginal deliveries. Her most recent surgery was 5 years ago. None of the surgeries or deliveries were complicated by bleeding.

- 6) Which one of the following is an appropriate plan for laboratory investigation of this patient?
- A. Check factor levels VIII, and vWF
 - B. Order lupus anticoagulant testing
 - C. Order 50:50 mixing study
 - D. Check factor XII level

Case 3

A 65 year old female is in the preoperative clinic in preparation for surgery for a left knee arthroplasty. She had an idiopathic DVT 1 year ago, requires indefinite anticoagulation and is taking Rivaroxaban 20 mg daily. She has hypertension and is taking ASA daily for primary prophylaxis of cardiovascular events, mild renal insufficiency (creatinine clearance 60 ml/min) secondary to hypertension and has mild hepatic dysfunction secondary to NASH (PT, APTT are normal). BMI is 30 kg/m².

7. Which one of the following is known to increase this patient's risk of peri-operative bleeding?

- a. She is taking ASA 81 mg daily for primary prophylaxis
- b. She has mild renal insufficiency secondary to hypertension
- c. She has mild hepatic dysfunction secondary to NASH
- d. She has a BMI of 30 kg/m²

8. Which one of the following is the recommended strategy for pre-operative management of her anticoagulation?

- A. Discontinue Rivaroxaban last dose 5 days pre-op, bridge with heparin
- B. Discontinue Rivaroxaban last dose 4 days pre-op, no bridging needed
- C. Discontinue Rivaroxaban last dose 3 days pre-op, no bridging needed
- D. Discontinue Rivaroxaban last dose 2 days pre-op, no bridging needed

9. The patient's surgery is uneventful, with minimal intra-operative blood loss. She has achieved hemostasis. Which one of the following is the recommended strategy for post-operative anticoagulation in this patient?

- A. Resume Rivaroxaban at usual dose on day 2 post op if no evidence of bleeding
- B. Resume Rivaroxaban at usual dose when there is no evidence of bleeding
- C. Resume Rivaroxaban at prophylactic dose on day 1 post operatively
- D. Resume Rivaroxaban at prophylactic dose when there is no evidence of bleeding

10. 72 hours after surgery, you are called as it has been discovered that instead of the 20 mg of rivaroxaban she has been administered 20 mg bid for 2 days. The PT is 20 seconds (9.7-11.8) and APTT is 45 seconds (20-32). Which one of the following is an appropriate management plan?

- A. Assess patient and order CBC, creatinine, determine the creatinine clearance, if no evidence of bleeding no need for any change in management
- B. Assess patient and order CBC, creatinine, determine the creatinine clearance, if no evidence of bleeding hold rivaroxaban for 24 hours and then resume
- C. Assess patient and order anti-Xa level, if supratherapeutic anti-Xa level, hold rivaroxaban for 24 hours
- D. Use another anticoagulant

11. Alternate ending: 72 hours after surgery, you are called as it has been discovered that instead 20 mg of rivaroxaban she has been administered 20 mg bid for 2 days. The PT is 20 seconds (9.7-11.8 s) and APTT is 45 seconds (20-32). She begins to have hematemesis and is hypotensive (60/30 mm Hg). You aim to maintain hemoglobin > 70 g/L while bleeding and consult for endoscopic management. Which one of the following is an appropriate management plan?

- A. If rivaroxaban given within last 2 hours consider charcoal to remove the drug, administer tranexamic acid 1 g iv then 1 g iv over 8 hours, administer prothrombin complex concentrate (PCC) 50 U/kg maximum 3000 U iv or according to hospital policy.
- B. If rivaroxaban given within last 2 hours consider dialysis to remove drug, administer tranexamic acid 1 g iv administer PCC 50 U/kg maximum 3000 U iv or according to hospital policy.
- C. If rivaroxaban given within 7 hours, administer andexanet.
- D. If rivaroxaban given within 6 hours, give frozen plasma to reverse anti-coagulant effect.