Transfusion Camp 2021-2022
Day 3: Seminar 3A, January 21, 2022
"Perioperative Bleeding Assessment", Originally developed by Dr. Elianna Saidenberg. Modified by Dr. Zachary Liederman

---

Case 1

You are seeing a 52-year-old woman for elective hip replacement. Past medical history is significant for hypertension. When asked about other comorbidities, the patient casually notes that she had some bleeding in the past, but does not think it was really unusual or severe. Her current medications are hydrochlorothiazide and a daily multivitamin. She has two children.

1) Which one of the following is the appropriate next step in perioperative bleeding risk assessment?
   A. Ask about family history of bleeding disorders
   B. Check labs: INR, aPTT, CBC
   C. No further assessment required, patient is ok to proceed to OR
   D. Take more thorough history of bleeding symptoms

Spoiler alert (reading ahead may provide answers to earlier questions)

Her comprehensive bleeding history is as follows 1) tonsillectomy age 7: required return to OR at 24 hours for surgical hemostasis and 1 unit transfusion RBCs; 2) G3A1L2: prolonged bleeding following spontaneous pregnancy loss at 13 weeks and required D&C and IV iron; and 2 uncomplicated C sections. Currently post menopause. Previously menstrual cycles were regular and lasted for 7 days with 3 heavy days where she changed pads every 2 hours. She feels that this history is not unusual since her mother and sisters had similar problems. Despite her mother and sisters having similar bleeding symptoms, no one in her family has been assessed for a bleeding disorder.

2a) What is the patient's bleeding score using the Condensed MCMDM-1 Bleeding Questionnaire?

2b) 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. Check labs: von Willebrand Factor multimer analysis
D. Refer to a hematologist

Spoiler alert (reading ahead may provide answers to earlier questions)

The patient is assessed by a hematologist. 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)

3a) The patient's history and lab findings are consistent with von Willebrand's disease type 1 (VWD). Why did she not experience bleeding with her two Ceasarean sections?

A. Cesarean sections are low risk for bleeding and excessive hemorrhage would not be expected in a patient with a non-severe bleeding disorder
B. During pregnancy there is a compensatory increase in factors IX and XI which help mitigate bleeding at delivery
C. Von Willebrand Factor levels are hormone-responsive and increase with pregnancy and use of hormone-containing medications
D. The patient received oxytocin which is known to increase levels of von Willebrand factor

Advanced follow up question 1: Which VWD patients would not be expected to correct during pregnancy?

Advanced follow up question 2: Why is the patient's aPTT normal if her FVIII level is low?

4) Following consultation with a hematologist, the patient still wishes to proceed with hip replacement. Which one of the following is **false** 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 at a hemophilia treatment centre
B. As her von Willebrand factor levels and FVIII levels are both decreased, she will require factor replacement with two different products
C. She will need factor concentrate infused before surgery and again in the post-operative period
D. She should receive DVT prophylaxis

Case 2

A 24-year-old male is scheduled for aortic valve replacement. Past medical history is significant for bicuspid aortic valve and only medication is Enoxaparin 40 mg daily for DVT prophylaxis (started on admission). Pre-operative testing shows APTT is 45 seconds (N= 26 to 35 seconds). A repeat test confirms the same PTT.

The resident on call remembers transfusion camp and completes a comprehensive bleeding assessment. MCMDM-1 Bleeding Questionnaire score is 0 (including no bleeding following wisdom teeth removal). They consult hematology for additional recommendations.

5) You are rotating through general hematology. Which one of the following represents the best next step?
   A. Stop Enoxaparin and repeat testing in 1 day
   B. Administer vitamin K 10 mg and repeat testing in 1 day
   C. Order 50:50 mixing study
   D. No further testing is required as the bleeding score is 0

Spoiler alert (reading ahead may provide answers to earlier questions)

A 50:50 mixing study is done and does not correct.

6) Which one of the following is most likely to confirm a diagnosis?
   A. Fibrinogen level
   B. Factors VIII and IX
   C. Lupus anticoagulant (non-specific inhibitor) testing
   D. Factor VIII inhibitor test

Advanced follow up question: Does a normal PTT exclude a lupus anticoagulant?

Case 3

A 28 year old G1A0L0 is followed for an uncomplicated pregnancy. A CBC performed at 20 weeks GA shows a platelet count of 109 $x10^9$/L. She has only one previous laboratory test result, done when she was investigated for possible infectious mononucleosis 4 years prior. At that time her platelet count was 297 $x10^9$/L. MCMDM-1 score is 1 based on easy bruising.

7) Which one of the following is the most appropriate next step in investigation of this patient's laboratory abnormality?
   A. Platelet antibody studies to investigate for possible immune thrombocytopenia
   B. Repeat CBC in 2 weeks to determine platelet count trend
   C. Test family members to determine if patient has a hereditary platelet disorder
   D. Assess for Type 2b VWD as cause of thrombocytopenia

Spoiler alert (reading ahead may provide answers to earlier questions)

The patient has CBC done every 2 weeks. When she is at 24 weeks GA her platelet count has decreased to 79x10^9/L. She has no bleeding symptoms and ultrasound shows no fetal or placental abnormalities. The patient is referred to a hematologist. Serologic investigations for infectious and autoimmune conditions associated with thrombocytopenia are done and are all negative.

A diagnosis of ITP is made. She continues to have CBC done every 2 weeks with a plan to increase frequency of monitoring to weekly at 34 weeks.

At 32 weeks GA the patient's platelet count has dropped to 48x10^9/L

8) What should the patient be counselled about delivery at this time?
   A. Vaginal delivery is unsafe for the mother at a platelet count less than 50x10^9/L
   B. Vaginal delivery is unsafe for the fetus due to the risk of neonatal ITP
   C. Patient should have labour induced within 2 weeks given the risk of further deterioration of platelet counts
   D. Neuraxial anesthetic is relatively contraindicated at a platelet count below 50x10^9/L

9) The patient indicates that she wishes to have the option of epidural or spinal anesthetic. Which one of the following is the best management plan.
   A. Advise the patient that an epidural or spinal anesthetic will not be possible.
   B. Rituximab 375 mg/m^2 IV x 4 doses
   C. Prednisone 1 mg/ kg po daily x 14-21 days
   D. IVIG 0.4 g/kg x 1

Advanced follow up question: Describe the pros and cons of prednisone versus dexamethasone for this patient?

The patient is started on prednisone with good effect. At 36 weeks GA she presents to hospital in early labour, her platelet count is 88 x10^9/L.

10) Which one of the following is the best management with regards to epidural/ spinal anesthetic?
   A. Provide IVIG to increase her platelet count to at least 100x10^9/L ensuring that she can have an epidural anesthetic within 2-4 hours.
   B. Provide a platelet transfusion before insertion and removal of epidural catheter/ spinal anesthetic.
   C. Strongly advise against an epidural or spinal anesthetic since her platelet count is below 150x10^9/L.
   D. Proceed with epidural/ spinal anesthetic.

Advanced follow up question: How does a diagnosis of ITP impact decisions around DVT prophylaxis?

Advanced follow up question 2: How would management change if the patient presented with placental abruption with fetal distress requiring urgent delivery and platelet count was 15 x10^9/L.