Perioperative Approach to Anticoagulants and Hematologic Disorders

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KEYWORDS

• Preoperative evaluation • Coagulopathy • Coagulation disorder • Hemophilia
• Von Willebrand disease • Thrombocytopenia • Immune thrombocytopenia
• Drug-induced thrombocytopenia

KEY POINTS

- History and physical examination should guide further evaluation of bleeding risk rather than routine blood testing.
- Use a risk prediction model, such as the Caprini risk assessment, to stratify preoperative patients for their risk of postoperative venous thromboembolism (VTE) and prescribe therapies based on this risk. Patients with increased risk of bleeding may warrant mechanical prophylaxis as opposed to pharmacologic prophylaxis.
- Warfarin should be stopped 5 days before most major surgeries except in those patients having minor procedures (eg, certain dermatolgic surgeries and cataract surgeries) that can be performed while on warfarin.
- Apply evidence-based American College of Chest Physicians (ACCP) guidelines for the perioperative management of antithrombotic therapy and tailor bridging therapy depending on the risks and benefits.
- Target-specific oral anticoagulants (TSOACs) are indicated for VTE prophylaxis after major joint replacement, after VTE treatment, and for stroke prevention in atrial fibrillation. Given the various indications, dosages, and pharmacokinetics, it is important to review these details prior to prescribing them for patients.

COAGULATION DISORDERS

Accurate history and physical examination precede any assessment. To assess the risk of perioperative bleeding, a preoperative history should include questions that identify[1]

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- Excessive bruising
- Excessive bleeding
  - For longer than 3 minutes after brushing teeth
  - Frequent nose bleeds
  - Prolonged bleeding after cuts
  - After dental extractions, surgery, or childbirth
- History of occult or frank gastrointestinal or genitourinary tract blood loss
- Family history of hemophilia or a coinherited hematologic disorder
- Personal history of liver disease, hypersplenism, renal dysfunction, or hematologic or collagen vascular disease
- Current or recent use of medications that interfere with hemostasis

Physical examination should focus on signs of excessive bleeding, such as petechiae, hematomas, and purpura. In addition, signs of cirrhosis, such as jaundice, scleral icterus, and spider angiomata, may alert a clinician to potential postoperative bleeding complications.[1]

Assessment of Perioperative Bleeding Risk

The history and physical examination should guide further evaluation, rather than routine blood testing.[1–3] Recent American Society of Anesthesiologists (ASA) guidelines[4] noted coagulation abnormalities

- In 0.06% to 21.2% of asymptomatic or unselected patients, which led to 0% to 4% of cancellations or changes in management perioperatively
- In 3.4% to 29.1% of selected or indicated patients, with no reported changes in clinical management

Therefore, ASA guidelines do not recommend routine coagulation testing preoperatively in asymptomatic or nonselected patients; for the at-risk patients (bleeding disorders, renal or liver dysfunction, and type and invasiveness of procedure) undergoing regional anesthesia, insufficient data were available for the ASA to provide a recommendation.

Commonly obtained tests to assess bleeding risk include prothrombin time (PT), activated partial thromboplastin time (aPTT), and platelet count. PT and aPTT are tests were developed to test the integrity of the coagulation pathway, not designed to predict perioperative bleeding.[1,2] Abnormal platelet count, whether thrombocytopenia (<150,000) or thrombocytosis (>440,000), has been associated with higher risk of perioperative bleeding.[1] Other available tests include bleeding time, platelet function monitoring, thrombin time (TT), reptilase time, fibrinogen, and D dimer.[2]

For patients with an indication, the following provides an approach to common abnormalities that may be encountered preoperatively.

Assessment of the Coagulation Pathway

Approach to prothrombin time abnormality

PT reflects the extrinsic and common coagulation pathways.[5] It reflects the time it takes platelet-poor plasma to form a clot in the presence of tissue thromboplastin and calcium. Although there are different methods to report PT, the most accepted measurement is the international normalized ratio, which standardizes the results across different thromboplastin test reagents; normal range is 0.9 to 1.2. If PT (or aPTT) is prolonged, it should first be confirmed with a repeat peripheral blood sample.[2,5] Once confirmed, a systematic approach should be used (**Fig. 1**).