Perioperative Management of Antiplatelet Therapy

Thrombosis Canada
Thrombose Canada

Objective:

To provide guidance to clinicians, based on the American College of Chest Physicians Clinical Practice Guideline (2022) and the ESC Guidelines on cardiovascular assessment and management of patients undergoing non cardiac surgery (2022) for the perioperative management of patients on antiplatelet therapy who require non-cardiac or cardiac surgery.

Background:

Antiplatelet drugs are commonly used in the primary and secondary prevention of cardiovascular disease. Patients receiving antiplatelet therapy have a broad range of cardiovascular risk depending on the clinical indication for treatment.

With over 200 million noncardiac surgical procedures performed worldwide each year, clinicians face unique challenges regarding the perioperative management of patients with coronary artery disease who are receiving acetylsalicylic acid (ASA) alone; P2Y12 inhibitor (clopidogrel, prasugrel, ticagrelor) alone; or any combination of ASA and a P2Y12 inhibitor. Clinicians must balance the risks of major adverse cardiovascular events associated with interrupting these therapies against the risk of bleeding from continuing these therapies in the perioperative period. Additionally, other factors including the pharmacokinetic actions of antiplatelet drugs and the optimal timing of surgery in patients with coronary stenting must be considered. The latter group of patients requires special consideration due to the increased risks and significant mortality of stent thrombosis.

Risk Stratification for Perioperative Thrombosis and Bleeding

Risk stratification for thrombosis and bleeding is largely empiric in patients who are receiving antiplatelet therapy. Patients considered at highest risk for cardiovascular events in the perioperative period include those with; recently (i.e. within one year) implanted bare metal stents (BMS) or drug-eluting stents (DES), recent myocardial infarction (MI), carotid ulcerating plaque, aortic ulcerating plaque, systemic embolism or stroke. Patients at low risk for perioperative cardiovascular events are those taking antiplatelet therapy for primary prevention of MI, limb ischemia or stroke. Clinicians must balance these risks against the associated risks of perioperative bleeding (listed in Table 1).

Diagnostic Testing, Arthrocentesis, and Minor Dental, Skin and Eye Procedures

Patients undergoing arthrocentesis, minor dental (extraction, root canal), eye (cataract) or skin (biopsy, skin cancer excision) procedures, as well as low bleeding risk diagnostic procedures, can continue ASA without interruption. Less is known about the safety of continuing P2Y12 inhibitors (clopidogrel, ticagrelor,

prasugrel) around minor procedures when taken as monotherapy. It is reasonable to continue them before the procedure. If patients are also taking ASA (dual antiplatelet therapy), the P2Y12 should be discontinued prior to surgery (clopidogrel for 5 days and ticagrelor for 3-5 days, prasugrel for 7 days) while ASA is continued.

Patients having a diagnostic test associated with a higher risk for bleeding should be managed like higher risk surgeries, as outlined below.

Management of Patients without Coronary Stents Undergoing Elective or Non-Urgent Noncardiac Surgery

The Perioperative Ischemic Evaluation (POISE) 2 randomized control trial evaluated the perioperative antiplatelet drug management in noncardiac surgery. This placebo-controlled trial assessed immediate pre-operative ASA initiation (200 mg) or ASA continuation in 10,010 patients with known or at risk for coronary artery disease. It demonstrated that continuing/initiating ASA did not reduce the risk for non-fatal MI or death (7.0% vs 7.1%; RR 0.99; 95% CI: 0.86-1.2), a finding observed in both initiation and continuation strata, but increased the risk for major bleeding (4.6% vs 3.8%; RR 1.2; 95% CI: 1.01-1.50).

The PEP trial involved 17,444 patients who required hip fracture or hip/knee joint replacement. Patients were randomized to receive ASA or placebo started preoperatively and continued for 35 days. ASA use was associated with a decreased risk for VTE (RR 0.71; 95% CI: 0.54-0.94) and did not affect the risk for MI (RR 1.57; 95% CI: 0.93-2.65) or stroke (RR 1.13; 95% CI: 0.69-1.85) but conferred an increased risk for major bleeding (2.9% vs 2.4%; P=0.04).

Initiating ASA before surgery to reduce perioperative cardiovascular events is not recommended.

Decision to continue ASA preoperatively should take bleeding risk of the surgical procedure into account. In patients receiving ASA who are undergoing elective non-cardiac surgery, we suggest ASA continuation over ASA interruption in surgeries with low to moderate risk of perioperative bleeding (table1).

ASA should be continued in patients undergoing carotid endarterectomy or and those with recent acute coronary syndrome or stroke.

ASA should be continued in patients with coronary stents to reduce the risk of stent thrombosis and MI (refer to section below).

Perioperative ASA continuation might also be reasonable for surgical interventions to prevent local thrombosis (e.g. lower extremity bypass or arterial aneurysm repair).

Consider ASA interruption in select patients undergoing a non-cardiac surgery associated with a high-bleeding risk. If ASA interruption is adopted, we suggest interruption for 7 days.

In patients with an indication for chronic ASA, we suggest resumption when the risk of bleeding related to surgery has passed. It is recommended to restart anti-platelet therapy within 24 hours post-surgery if adequate hemostasis has been achieved.

Management of Patients with Coronary Stents Undergoing Elective or Non-Urgent Noncardiac Surgery

A sub-study of the POISE-2 trial involving 470 patients with previous percutaneous coronary intervention (PCI) and cardiac stents revealed that for every 1000 patients with prior PCI, perioperative ASA will prevent 59 myocardial infarctions but cause 8 major bleeds. It is, therefore, viewed that in patients with prior PCI undergoing noncardiac surgery, perioperative ASA may be more likely to benefit than harm patients.

A retrospective study of 20,590 patients with coronary stents who underwent non cardiac surgery, demonstrated that the risk for adverse cardiovascular outcomes appeared highest in the initial 6 weeks after stent placement (8%-10%) and appeared to plateau at 6 months (1%-2%) and remain stable at 24 months.

Clinicians must consider the timing of surgery and perioperative dual antiplatelet (DAPT) management in patients being treated with DAPT after PCI with a BMS or DES.

In patients with a previous PCI (≥ 12 months), it is recommended to continue ASA peri-operatively if the bleeding risk allows.

It is recommended to delay **ELECTIVE NCS** until 6months after elective PCI and 12 months after an ACS.

Following an elective PCI, it is recommended to delay time-sensitive NCS until a minimum of 1 month of DAPT treatment has been given.

Before time-sensitive NCS, in high-risk patients (STEMI, ACS) with a recent PCI (within the last 6 to 12 weeks), DAPT duration of at least 3 months should be considered. We recommend that management of antiplatelet therapy be discussed between the surgeon, anesthesiologist, and cardiologist.

	Timing of Non-cardiac Surgery	Perioperative Antiplatelet Management
PCI Patients with a Bare Metal Stent	Recommended to delay surgery for at least 1 month after PCI	ASA should be continued perioperatively. Clopidogrel should be withheld 5 days preoperatively, and prasugrel 7 days preoperatively, and ticagrelor 3-5 days preoperatively
		P2Y12 inhibitor should be restarted as soon as it is deemed safe by the surgeon
PCI Patients with a Drug Eluting Stent	Recommended to delay surgery for at least 3 months after PCI. If semi-urgent surgery is required, surgery should be delayed at least 1 month after PCI with a DES.	ASA should be continued perioperatively. Clopidogrel should be withheld 5 days preoperatively, and prasugrel 7 days preoperatively, and ticagrelor 3-5 days preoperatively
		P2Y12 inhibitor should be restarted as soon as it is deemed safe by the surgeon

Management of Patients Requiring Elective or Semi-Urgent CABG after Acute Coronary Syndrome (ACS)

Coronary artery bypass grafting is associated with a high risk of bleeding with potentially significant consequences (i.e. cardiac tamponade, death). An interdisciplinary assessment of the risks of coronary

thrombotic complications and risk of perioperative bleeding should be performed with the surgeon, interventional cardiologist, attending physician / cardiologist and the patient.

Treatment	Semi-urgent CABG	Elective CABG
ASA	ASA should be continued in all patients with ACS who require CABG	
Ticagrelor	Suggested to discontinue a minimum of 48-72 hours prior to surgery to minimize the risk of bleeding.	Recommended to be discontinued ideally 5 days prior to surgery.
Clopidogrel	Suggested to discontinue a minimum of 48-72 hours prior to surgery to minimize the risk of bleeding.	Recommended to be discontinued ideally 5 days prior to surgery.
Prasugrel	Suggested to discontinue a minimum of 5 days prior to surgery to minimize the risk of bleeding.	Recommended to be discontinued ideally 7 days prior to surgery.

Table 1: Risk of Perioperative Bleeding

LOW/VERY LOW RISK	MODERATE RISK	HIGH RISK
• Cataract surgery • Dermatologic procedures (e.g. biopsy) • Gastroscopy or colonoscopy without biopsies • Coronary angiography (using radial arterial approach) • Permanent pacemaker insertion or internal defibrillator placement (if bridging anticoagulation is not used) • Selected procedures with small-bore needles (e.g. thoracentesis, paracentesis, arthrocentesis) • Dental extractions (1 or 2 teeth) • Endodontic (root canal) procedure • Subgingival scaling or other cleaning	• Abdominal surgery (e.g. cholecystectomy, hernia repair, colon resection) • Other general surgery (e.g. breast) • Other intrathoracic surgery • Other orthopedic surgery • Other vascular surgery • Non-cataract ophthalmologic surgery • Coronary angiography (using femoral artery approach) • Gastroscopy or colonoscopy with biopsies • Selected procedures with large-bore needles (e.g. bone marrow biopsy, lymph node biopsy) • Complex dental procedure (e.g. multiple tooth extractions)	• Any surgery or procedure with neuraxial (spinal or epidural) anesthesia • Neurosurgery (intracranial or spinal) • Cardiac surgery (e.g. CABG, heart valve replacement) • Major vascular surgery (e.g. aortic aneurysm repair, aortofemoral bypass) • Major orthopedic surgery (e.g. hip/knee joint replacement surgery) • Lung resection surgery • Urological surgery (e.g. prostatectomy, bladder tumour resection) • Extensive cancer surgery (e.g. pancreas, liver) • Intestinal anastomosis surgery • Reconstructive plastic surgery • Selected procedures involving vascular organs (e.g. kidney biopsy, prostate biopsy) or high bleed risk intervention (e.g. pericardiocentesis, spinal injection, polypectomy)

Other Relevant Thrombosis Canada Clinical Guides

- Acetylsalicylic Acid (ASA®)
- Clopidogrel (Plavix®)
- Prasugrel (Effient®)
- Ticagrelor (Brilinta®)

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