

Perioperative Antithrombotic Medication Management for Patients with Cardiac Stents

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ABSTRACT

The perioperative management of antithrombotic agents in patients who have a cardiac stent presents a dilemma. Mismanagement of these agents in the perioperative period is associated with increased morbidity, mortality and cost of care. In one incident, a patient suffered from acute stent thrombosis and died on the morning of his elective procedure due to the early discontinuation of their antithrombotic medication. We developed a practical decision-support algorithm based on current guidelines from the American College of Cardiology, Society for Cardiovascular Angiography and Interventions and The American College of Chest Physicians. The goal of the decision-support algorithm was to evaluate baseline performance and to aid providers in the appropriate perioperative management of these agents. To evaluate baseline performance we performed a prospective surveillance study through the surgical preparatory screening phone calls, then hand reviewed medical records of twenty-two patients to determine perioperative management of Aspirin and Plavix. We found that 95% of cases were non compliant with the recommended guidelines. Further studies are needed to evaluate if baseline performance can be improved.

INTRODUCTION AND BACKGROUND

Coronary artery disease currently affects 16 million people and continues to be the leading cause of death in the U.S.(1) . A common method of treatment is through percutaneous coronary artery intervention (PCI) and stenting. In 2005, an estimated 1,265,000 PCI procedures were performed.(1) Of these patients, it is estimated that five percent will undergo non-cardiac surgery within one year of stent placement.(2) As a result, the number of patients with PCI who present for non-cardiac surgery is increasing and management of these patients in the perioperative period is an important and contemporary challenge. (3)

Elective and emergent surgery is associated with increased morbidity and mortality among patients taking antithrombotic agents. Guidelines from the American College of Cardiology, American Heart Association, Society for Cardiovascular Angiography and Interventions, and the American College of Chest Physicians provide recommendations for the management of antithrombotic agents during the perioperative period. Nevertheless, a gap exists in the translation of these guidelines into routine clinical practice. As a result, patients can suffer significant preventable harm.

INTRODUCTION AND BACKGROUND (cont)

At Johns Hopkins, we have identified several patients that have had early and inappropriate discontinuation of perioperative antithrombotic agents or failure to restart these medications when indicated. At least two patients died, two patients suffered a stroke with residual deficits, and one patients planned surgery was cancelled on the day of surgery.

The Perioperative Anti-Platelet and Anticoagulation Management Task Force is a multidisciplinary team including representatives from multiple divisions (surgery, anesthesia, patient safety, risk management, hematology, cardiology, pharmacology, information technology, surgical scheduling) working to improve adherence with current guidelines for management of antithrombotic agents during the perioperative period. The task force is focused on improving care coordination and developing systems based operational processes to support guideline implementation. Specifically, the taskforce summarized current guideline recommendations and developed decision support tools (Figure 1) to evaluate baseline performance and help guide providers with the appropriate perioperative antithrombotic medication management for patients with cardiac stents.

METHODS

Utilizing the pre-op screening phone calls, we conducted prospective surveillance to identify patients on antithrombotic agents, including Aspirin and Plavix scheduled to undergo elective non-cardiac surgery. We then hand reviewed individual medical records to determine the current approach to the perioperative management of Aspirin and Plavix. We used descriptive statistics to summarize current performance compared to current guideline recommendations.

Antiplatelet Bridging for Patients with Cardiac Stents

For low bleeding risk surgical procedures, interruption of antiplatelet therapy is typically not necessary
(See Table 1 for low risk procedures)

Common Antiplatelet Regimens and Minimum Duration Stent Implantation*	
Bare Metal Stent (BMS)	Aspirin 81 mg plus Clopidogrel 75 mg daily or Prasugrel 10 mg daily or Ticagrelor 90 mg twice daily for 1 month
Drug Eluting Stent (DES)	Aspirin 81 mg plus Clopidogrel 75 mg daily or Prasugrel 10 mg daily or Ticagrelor 90 mg twice daily for 12 months

*For Low Risk Patients (See Below for High Risk Features)

- For Elective Procedures
 - Postpone procedure until minimum duration of dual antiplatelet therapy is complete
- Please consult Cardiology **14 days** prior to procedure to develop a plan for antiplatelet management for the following patients
 - Surgery required prior to minimum duration of antiplatelet therapy (see above)
 - Complex coronary anatomy with intervention
 - Proximal Left Anterior Descending (LAD) stent
 - Left Main (LM) Stent
 - Stent placement at bifurcation of arteries
 - Overlapping stents
 - Long stents
 - Small diameter
 - Any episodes of stent thrombosis
- If minimum antiplatelet duration met and patient deemed low risk, stop antiplatelet according to table below

Antiplatelet	Holding Time
Clopidogrel	5 days
Prasugrel	7 days
Ticagrelor	5 days
Ticlopidine	10-14 days

- Continue low-dose aspirin (81mg) throughout the periprocedure period for all patients.
 - Surgical Exceptions (aspirin may be held for maximum of 5 days)
 - Posterior Chamber of Eye
 - Spinal Canal
 - TURP
 - Intracranial
- For urgent surgery or minimum duration of antiplatelet therapy reached, but patient deemed high risk of thrombosis, initiate intravenous bridge therapy according to below tables in concert with Cardiology Consult
- Post-operative initiation of antiplatelet therapy should begin as soon as adequate hemostasis is achieved. Patients can be restarted on their home dual antiplatelet therapy. A loading dose of their antiplatelet can be considered.

Antiplatelet	Loading Dose
Clopidogrel	300 or 600 mg
Prasugrel	60 mg
Ticagrelor	180 mg
Ticlopidine	500 mg

References

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RESULTS

We collected information on 22 cardiac stent patients who were scheduled to undergo a variety of elective non-cardiac surgeries in a three-month period (May 2011 through July 2012) (Table 1). Of these, 50% (11/22) of patients were evaluated by an anesthesia consult or the JHH preoperative evaluation clinic prior to surgery. The remaining patients had their preoperative evaluation outside of JHH.

Table 1: Types of non-cardiac surgeries

Surgical Specialties included in our study	Number of cases included
General Surgery	4
Otolaryngology	6
Plastic	1
Colorectal	3
Urology	7
Oncology	1

Overall, 1 out of 22 patients had appropriate perioperative management of their antithrombotic agents. Management of Aspirin and Plavix was not consistent with current guideline recommendations for the vast majority (95%) of patients (Table 2).

Table 2: Perioperative Compliance with Guideline Recommendations

Perioperative Compliance	
Overall	5% (1/22)
Aspirin	9% (2/22) stopped ASA <5 days
Plavix	30% (3/10) stopped Plavix <5 days

Current practice regarding the management of antithrombotic agents varied widely (Table 3). In addition, 32% (7/22) of patients were discharged home without resuming their preoperative Aspirin therapy; 50% (5/10) of patients were discharged home without resuming their preoperative Plavix therapy. One patient experienced a myocardial infarction in the postoperative period.

Table 3: Perioperative management at baseline

	Stopped (Preop)	Re-started Postop (Range)
Aspirin	9 days (2-29)	4 days (0-14)
Plavix	13 days (6-37)	5 days (1-14)

FUTURE DIRECTIONS

Our team is in the process of writing manuscript about our findings that we hope to have published by BMJ Quality & Safety. We look towards this publication and future outreach to change perioperative medication management of patients with cardiac stents.

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