Peri-endoscopic Management of Antithrombotics & Anticoagulants

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Objectives

- Review **Bleeding Risk**: Endoscopic Procedures and Interventions
- Risk Stratification of Low & High risk **Thrombotic Conditions** Encountered in Clinical Practice
- Review **Newer** AntiPlatelet Therapy Options and **Novel Oral** AntiCoagulants
- Discuss current concepts & best practice principles based on available data

Balancing Risk of GI Bleeding vs Risk of Thromboembolic Events

GI Bleeding @ Endoscopy

Thromboembolic Event
Anti-Thrombotic Agents

• Anticoagulants
  – Warfarin
  – Heparin
  – Low molecular weight heparin
  – Novel Oral AntiCoagulants (NOAC)

• Anti-platelet agents
  – Aspirin
  – Non-steroidal anti-inflammatory agents (NSAID)
    – Thienopyridine (clopidogrel, ticlopidine)
    – Glycoprotein IIb/IIIa receptor inhibitors

Focus On

• Aspirin
• Warfarin (vit K: II, VII, IX, X)
• Clopidogrel
• NOACs
  – Apixaban (Xa)
  – Rivaroxaban (Xa)
  – Dabigatran (Thrombin)
Management of antithrombotic agents for endoscopic procedures

Antithrombotic agents include antiplatelet agents and anticoagulant agents. Antiplatelet agents are used to prevent inhibition of platelet aggregation and are typically administered in the setting of procedures that involve the introduction of a foreign body into the gastrointestinal tract, such as endoscopic retrograde cholangiopancreatography (ERCP) or endoscopic ultrasonography (EUS). Antiplatelet agents are also used to prevent thrombosis in patients who are undergoing surgical procedures or who are at risk of developing thrombosis due to other medical conditions.

Endoscopic antithrombotic agents are used to prevent thrombosis in patients who are undergoing endoscopic procedures or who are at risk of developing thrombosis due to other medical conditions. Antithrombotic agents are typically administered in the setting of procedures that involve the introduction of a foreign body into the gastrointestinal tract, such as endoscopic retrograde cholangiopancreatography (ERCP) or endoscopic ultrasonography (EUS). Antithrombotic agents are also used to prevent thrombosis in patients who are undergoing surgical procedures or who are at risk of developing thrombosis due to other medical conditions.

DEFINITIONS

Procedural risk

Antithrombotic, antiplatelet agents, and anti-coagulants are critical in the management of patients undergoing endoscopic procedures. Antithrombotic agents are used to prevent thrombosis in patients who are undergoing endoscopic procedures or who are at risk of developing thrombosis due to other medical conditions. Antiplatelet agents are used to prevent inhibition of platelet aggregation, which can lead to the formation of blood clots. Anticoagulants are used to prevent the formation of blood clots by inhibiting the coagulation process.

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Antithrombotic, antiplatelet agents, and anti-coagulants are critical in the management of patients undergoing endoscopic procedures. Antithrombotic agents are used to prevent thrombosis in patients who are undergoing endoscopic procedures or who are at risk of developing thrombosis due to other medical conditions. Antiplatelet agents are used to prevent inhibition of platelet aggregation, which can lead to the formation of blood clots. Anti-coagulants are used to prevent the formation of blood clots by inhibiting the coagulation process.
**So How Should We Approach This?**

- What do we know right now? (questions that have been answered)
- What to do with anti thrombotic agents pre and post elective endoscopy?
- What to do with anti thrombotic agents in a patient with GI bleeding?
- Review our best practices for now... while we gain more experience with newer agents/more data becomes available

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**Surgical Interventions: Risk Stratification By Bleeding Risk**

**Low risk**
- Endoscopy with biopsy
- Prostate or bladder biopsy
- Electrophysiological study or radiofrequency catheter ablation for supraventricular tachycardia (including left sided ablation via single transseptal puncture)
- Angiography
- Pacemaker or ICD implantation (unless complex anatomical setting e.g. congenital heart disease)

**High risk**
- Complex left-sided ablation: pulmonary vein isolation, VT ablation
- Spinal or epidural anesthesia: lumbar diagnostic puncture
- Thoracic surgery
- Abdominal surgery
- Major orthopedic surgery
- Liver biopsy
- Transurethral prostate resection
- Kidney biopsy

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Endoscopic Procedures: Bleeding Risk

<table>
<thead>
<tr>
<th>Higher-risk procedures</th>
<th>Low-risk procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypectomy</td>
<td>Diagnostic (EGD, colonoscopy, flexible sigmoidoscopy)</td>
</tr>
<tr>
<td>Biliary or pancreatic sphincterotomy</td>
<td>including biopsy</td>
</tr>
<tr>
<td>Pneumatic or bougie dilation</td>
<td>ERCP without sphincterotomy</td>
</tr>
<tr>
<td>PEG placement</td>
<td>EUS without FNA</td>
</tr>
<tr>
<td>Therapeutic balloon-assisted enteroscopy</td>
<td>Enteroscopy and diagnostic balloon-assisted enteroscopy</td>
</tr>
<tr>
<td>EUS with FNA</td>
<td>Capsule enteroscopy</td>
</tr>
<tr>
<td>Endoscopic hemostasis</td>
<td>Enteral stent deployment (without dilation)</td>
</tr>
<tr>
<td>Tumor ablation by any technique</td>
<td></td>
</tr>
<tr>
<td>Cystogastrostomy</td>
<td></td>
</tr>
<tr>
<td>Treatment of varices</td>
<td></td>
</tr>
</tbody>
</table>

Risk Factors: GI Bleeding

- Older age
- Cigarette smoking
- Sleep apnea
- Male gender
- CVA, DVT
- Prior GI bleeding
- Renal Insufficiency
ISTH: Definitions of Bleeding

**Major bleeding**
- Decrease in haemoglobin of $\geq 2$ g/dl, or
- Transfusion of $\geq 2$ units of packed RBCs, or
- Bleeding into a critical site (intracranial, intraspinal, intraocular, pericardial, intra-articular, intramuscular with compartment syndrome, retroperitoneal)

**Life-threatening bleeding**
- Fatal bleeding, or
- Symptomatic intra-cranial bleeding, or
- Bleeding with decrease of haemoglobin of $\geq 5$ g/dl, or
- Bleeding requiring inotropic support, or
- Bleeding requiring surgery, or
- Transfusion of $\geq 4$ units of packed RBCs

Cardiovascular Conditions: Risk Status

<table>
<thead>
<tr>
<th>Higher-risk condition</th>
<th>Low-risk condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation associated with valvular heart disease, mitral valve, active</td>
<td>Uncomplicated or paroxysmal nonvalvular</td>
</tr>
<tr>
<td>congestive heart failure, left ventricular ejection fraction $&lt;35%$, a history of</td>
<td>atrial fibrillation</td>
</tr>
<tr>
<td>a thromboembolic event, hypertension, diabetes mellitus, or age $&gt;75$ y</td>
<td>Bioprosthesis</td>
</tr>
<tr>
<td>Mechanical valve in the mitral position</td>
<td>Mechanical valve in the aortic position</td>
</tr>
<tr>
<td>Mechanical valve in any position and previous thromboembolic event</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Recently ($&lt;1$ yr) placed coronary stent</td>
<td></td>
</tr>
<tr>
<td>Acute coronary syndrome</td>
<td></td>
</tr>
<tr>
<td>Nonstented percutaneous</td>
<td></td>
</tr>
</tbody>
</table>
Risk of Thromboembolic Event in Peri-endoscopic Period

- Atrial Fibrillation with h/o embolic events or valve disease
- Prosthetic Valve
- Coronary artery disease and stents
- Deep Venous Thrombosis/Pulmonary Embolus
- Stroke/Transient Ischemic Attack
- Hypercoagulable states

Prosthetic Valve

High risk conditions for thromboembolic events

- Bio prosthetic valve <3 months old
- Mechanical valve in mitral position
- Mechanical valve with previous thromboembolic event
Coronary Artery Disease and Stents
High risk conditions for thromboembolic events

• Recent acute coronary event <4-6 weeks

• Discontinuing dual antiplatelet therapy in:
  – Drug-eluting stent < 1 year
  – Bare metal stent < 1 month

Stroke/Transient Ischemic Attack
High risk conditions for thromboembolic events

• Cardioembolic events
• Carotid artery disease
• Recent carotid endarterectomy
• Hypercoagulable state
“...It is therefore strongly recommended that the gastroenterologist/endoscopist never be the one to instruct the patient to stop any anticoagulant or antiplatelet therapy. This should be a recommendation pending the patient finalizing approval by the prescriber of these agents — typically the cardiologist, neurologist, and vascular surgeon or primary care provider.”

Parth J. Parekh, MD, Jonathan Merrell, MD, Meredith Clary, MD, John E. Brush, MD, FACC, and David A. Johnson, MD, FACC, FASGE
Am J Gastroenterol 2014; 109:9 – 19

Antithrombotics: Mechanisms of Action & Current Knowledge
What do we know about Aspirin?

• ASGE Guideline: Continue ASA for GI procedures
• Numerous studies: ASA (and NSAIDs) no significant increase in risk of GI bleeding for routine GI procedures like EGD/biopsy, colonoscopy with polypectomy, ERCP/sphincterotomy
• For High risk bleeding GI procedures, may elect to hold for 5-7 days if patient at low risk for CV/CNS consequences... or could continue it

What About Adenosine Diphosphate Antagonists (Thienopyridines)?

• The thienopyridines block the ADP-dependent aggregation of platelets by inhibiting the P2Y 12 receptor.
• Clopidogrel, Prasugrel
• Similar to Aspirin (effect upto 7-10 days), the effect on the platelets can last for 5-7 days after the drug has been withdrawn
• No reversal agent
Adenosine diphosphate antagonists (Thienopyridines)

Coagulation Cascade: Warfarin & NOAC
Sites of Action
Novel Oral AntiCoagulants (NOAC)

- NOAC’s work in one of two ways:
- Rivaroxaban, Edoxaban and Apixaban: factor Xa inhibitors.
- Dabigatran: directly inhibiting thrombin – DTI

NOACs (Novel Oral Anticoagulation Agents)
- Stroke prevention in AF
- Prevention of DVT
- Treatment of DVT
- Preferred over Warfarin
  - Quick on/quick off
  - No monitoring needed
  - Fewer interactions
- Used globally
NOAC vs Warfarin

- NOAC: Proven “non-inferior” or superior
- No monitoring needed
- Faster onset of action (2-4 hrs)
  - Faster out of system (normal renal/hepatic function)
- Decreased risk of intracranial bleeding
- Apixaban 110 mg BID dose:
  - Decreased risk of bleeding into “any” site
- NOACs: associated with increased GI bleeding
- Antidote??

Upper GI Bleeding: NOAC Rx

- Vomiting 23%
- Mallory-Weiss tear 9.1%
- Duodenitis 9.1%
- Angiodysplasias 10.2%
- Esophagitis 11.4%
- Peptic Ulcer Disease 17.0%
- Gastritis 18.2%
- Normal/Unknown 21.6%
Management Guidelines

- Elective Endoscopic Procedures
- Acute GI Bleeding
Vivek Kaul, MD, FACG

General Approach to Patients on Antithrombotics Who Need Elective Endoscopy

- Delay ELECTIVE endoscopy until patient at lower risk for thromboembolism
- Discuss with patient’s cardiovascular or neurovascular physician whether (or when) drugs can be stopped
- Realize that only limited data exist
- Guidelines from ASGE, ESGE are only suggestions - Need to weigh the risks and benefits for each individual patient

Aspirin

- Stop it Rarely, if ever...
How To Manage Warfarin Prior to Endoscopic Procedures?

- Avoid Vitamin K before elective procedures: delays therapeutic re-anticoagulation after procedure.

- Warfarin can usually be stopped for 4-7 days and then be restarted the following day.

- 1% risk of thromboembolic events after temporary warfarin cessation.

- High risk patients for thromboembolic events: Bridge with LMW heparin.

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Example of Decision making in Elective Endoscopy: Warfarin

<table>
<thead>
<tr>
<th>Condition</th>
<th>Associated diagnosis</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation</td>
<td>None</td>
<td>Hold warfarin 4-7 days before procedure; Restart warfarin within 24 h.</td>
</tr>
<tr>
<td></td>
<td>Mechanical valve(s) and/or history of cerebrovascular accident, transient ischemic</td>
<td>Hold warfarin and start UFH when INR ≤ 2.0. Stop UFH 4-6 h before procedure and restart after</td>
</tr>
<tr>
<td></td>
<td>attack, or systemic embolism</td>
<td>procedure. Resume warfarin on the evening of the procedure and continue both agents until INR is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>therapeutic. Therapy doses of SQ UFH or LMWH may be considered in lieu of IV UFH.</td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td>Mechanical bivalvular, aortic valve</td>
<td>Hold warfarin 48-72 h before procedure for a target INR &lt; 1.5; Restart warfarin within 24 h.</td>
</tr>
<tr>
<td></td>
<td>Mechanical mitral valve or mechanical aortic valve plus any of the following: atrial</td>
<td>Hold warfarin and start UFH when INR ≤ 2.0. Stop UFH 4-6 h before procedure and restart after</td>
</tr>
<tr>
<td></td>
<td>fibrillation, previous thromboembolic event, left ventricular dysfunction,</td>
<td>procedure. Resume warfarin on the evening of the procedure and continue both agents until INR is</td>
</tr>
<tr>
<td></td>
<td>hypercoagulable condition, mechanical tricuspid valve or &gt; 1 mechanical valve</td>
<td>therapeutic. Therapy doses of SQ UFH or LMWH may be considered in lieu of IV UFH.</td>
</tr>
</tbody>
</table>

UFH: Unfractionated heparin; INR: international normalized ratio; SQ: subcutaneous; LMWH: low molecular weight heparin.

*Continuation or reinstatement of anticoagulation should be adjusted according to the stability of the patient and estimated risks surrounding the specific intervention/procedure performed. This table was adapted from the following guidelines: 2006 Guidelines for the Management of Patients with Atrial Fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the European Society of Cardiology Committee for Practice Guidelines and American College of Cardiology/American Heart Association 2006 guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.
NOAC’s

• No definitive guidelines... yet
• However, the fast onset and fast offset make cessation and resumption easier
• Usually 24 hours is enough time to hold, unless renal insufficiency or high risk procedure, in which 48 hours may be better.
• Check with the prescriber

NOAC: Risk Mitigation Strategies

• Ensure NOAC indicated
  – Refer to table
• Modifiable risk factors
  – EtOH
  – NSAIDS
  – Antiplatelet agents
  – H Pylori
• PPI cover
• Colon and EGD screen
• Renal function adjustment
When to restart NOACs after a planned surgical intervention

<table>
<thead>
<tr>
<th>Procedures with immediate and complete hemostasis:</th>
<th>Resume 6–8 h after surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atraumatic spinal/epidural anesthesia</td>
<td></td>
</tr>
<tr>
<td>Clean lumbar puncture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedures associated with immobilization:</th>
<th>Initiate reduced venous or intermediate dose of LMWH 6–8 h after surgery if hemostasis achieved.</th>
<th>Restart NOACs 48–72h after surgery upon complete hemostasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedures with post-operative risk of bleeding:</td>
<td></td>
<td>Thromboprophylaxis (e.g. with LMWH) can be initiated 6–8 h after surgery</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
</tbody>
</table>

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EGD Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk Bleeding</th>
<th>Stop Aspirin?</th>
<th>Stop Clopidogrel or Prasugrel?</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGD ± biopsy</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>EGD with stricture dilation</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>EGD with APC</td>
<td>Low</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EGD with stent placement</td>
<td>Low</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EGD with variceal band ligation</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EGD with PEG placement</td>
<td>High</td>
<td>No</td>
<td>? (probably)</td>
</tr>
<tr>
<td>EGD with EMR/ESD</td>
<td>High</td>
<td>?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Colonoscopy Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk of Bleeding</th>
<th>Stop aspirin</th>
<th>Stop clopidogrel or prasugrel?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonoscopy ± biopsy</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Colonoscopy with polypectomy &lt; 1 cm</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Colonoscopy with polypectomy &gt; 1 cm</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Colonoscopy with EMR/ESD</td>
<td>High</td>
<td>Yes (?)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Boustiere // ESGE Guidelines: Endoscopy 2011

### ERCP Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk Bleeding</th>
<th>Stop Aspirin?</th>
<th>Stop Clopidogrel or Prasugrel?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERCP Diagnostic</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>ERCP with Stent Placement</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>ERCP with sphincterotomy</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>ERCP with sphincterotomy and large balloon papillary dilation</td>
<td>High</td>
<td>Yes (?)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## EUS Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk Bleeding</th>
<th>Stop Aspirin?</th>
<th>Stop Clopidogrel or Prasugrel?</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUS Diagnostic</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>EUS with FNA Solid Mass</td>
<td>Low</td>
<td>No</td>
<td>Yes (?)</td>
</tr>
<tr>
<td>EUS FNA Cysts</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EUS FNA Therapeutic</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Boustiere // ESGE Guidelines: Endoscopy 2011

### Management of antithrombotic agents in the ELECTIVE endoscopic setting

- **Aspirin/NSAID**
  - Low Thrombotic Risk: Continue
  - High Thrombotic Risk: Discontinue

- **Thienopyridines (e.g., Clopidogrel)**
  - Low Platelet Aggregation Risk: Continue
  - High Platelet Aggregation Risk: Discontinue 3-10 Days Prior

- **Warfarin**
  - Low Hemorrhagic Risk: Continue
  - High Hemorrhagic Risk: Consider Discontinuing 3-10 Days Prior
  - In patients on dual antiplatelet therapy or warfarin, consider switching to a thrombolysis or considering bedside clot removal or pharmacologic thrombolytics instead.

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Management of antithrombotic agents for endoscopic procedures. ASGE Standards of Practice Committee. 2009
Management of Anti Thrombotic Agents in the Patient with GI Bleeding

Stopping or Reversing Antithrombotic Agents in the acutely bleeding patient

• Warfarin
  – Consider holding warfarin
  – Consider vitamin K, FFP, Factor VIIa
    • AHA/ACC recommendations
      – Fresh frozen plasma (FFP) >>>>> high dose Vitamin K
      – Avoid high-dose Vitamin K (10 mg) in mechanical valves as may cause hypercoag state
        » Low dose Vitamin K (1-2 mg) may be fine

• Antiplatelet agents
  – Consider stopping drug
  – Consider platelet transfusion
Restarting Antithrombotic Agents s/p Endoscopic Hemostasis

- Resumption of aspirin + PPI has lower rate of recurrent peptic ulcer bleeding than switching to clopidogrel (Chan, NEJM 2005)

- Continuation of low dose aspirin after endoscopic hemostasis results in lower all cause mortality (12.9% vs 1.3%) and higher rebleed rate (10.3% vs 5.4%) (Sung JJ, Ann Int Med 2010)

Risk of Interruption of Warfarin in GI Bleeding

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Unadjusted Hazard Ratio (95% CI)</th>
<th>p Value</th>
<th>Adjusted Hazard Ratio (95% CI)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thromboembolism</td>
<td>0.25 (0.55–0.98)</td>
<td>0.03</td>
<td>0.71 (0.54–0.93)</td>
<td>0.01</td>
</tr>
<tr>
<td>Recurrent gastrointestinal bleed</td>
<td>1.20 (0.79–1.86)</td>
<td>0.40</td>
<td>1.18 (0.94–1.46)</td>
<td>0.47</td>
</tr>
<tr>
<td>Mortality</td>
<td>0.72 (0.60–0.88)</td>
<td>&lt;0.0001</td>
<td>0.67 (0.56–0.81)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

CI = confidence interval.

Compared with holding warfarin for 30 days, restarting warfarin after 7 days was not associated with increased risk of GIB and was associated with decreased risk of mortality and thromboembolism

Qureshi et al, Am J Cardiol 2013.
Asia-Pacific Working Group Consensus on Non-Variceal Bleeding (Sung JJ, Gut 2011)

• Among aspirin users with high cardiothrombotic risk & PUD bleeding, resume aspirin ASAP
  – Because risk of rebleeding is greatest in 1st 72 hours, consider restart aspirin ~ 3 days after hemostasis
  – Uncertain about clopidogrel, but perhaps restart in 3-5 days
  – If dual therapy: No data; depends on type of stent and when placed
What About Endoscopic Therapy?

• After all, we are endoscopists......

• We should be able to fix everything!!!
Endoloops

Endoclips
What is the Efficacy of Endoscopic Therapy in This Setting?

- Retrospective studies suggest endoscopic therapy seems safe and effective (even with INR >4)
- Mechanical hemostasis (i.e. clips) preferred
  - Especially if will resume antithrombotic meds
- Colonoscopy with polypectomy was safe in a large cohort of consecutive patients on Clopidogrel (Singh et al GIE 2009)

Endoscopic Techniques Can Decrease Bleeding After Elective Polypectomy

NOAC’s: FIRST REVERSAL AGENT JUST APPROVED BY FDA!!

“....In trials, a five-minute infusion of Idarucizumab was able to reverse the blood thinning effects of Dabigatran in young adults, elderly patients and in those with mild renal/hepatic dysfunction...”

Glund S, Lancet 2015
Drugs, Dec 2015

Which risk we are willing to take?

Continue
Stop

ACS/stent thrombosis
CVA
DVT/PE

Recurrent bleeding
Continuing bleeding

We usually can stop GI bleeding while CVA/ACS are usually irreversible and devastating!!!
Let’s simplify a bit and review...

Warfarin

- Low risk endoscopy + low cardiovascular/ low cerebrovascular risk: may not have to stop...
- If High risk procedure or high CV/CNS risk:

Strongly consider heparin bridge
Thienopyridines (Clopidogrel)

- Always check with cardiologist/prescriber
- TYPE of stent
- AGE of stent
- Stroke history
- Usually if stopped is stopped for 5-7 days
- In nearly every instance, continue or substitute aspirin

GI Bleeding Management: NOAC

Anemia/Guaiac + stools
- Semi-elective evaluation reasonable (~1-2wks)
- Colonoscopy +/- EGD
- Small bowel evaluation if needed
- Typically would continue NOAC
- Monitor Hb/Hct
- Monitor for overt GI bleeding
GI Bleeding Management: NOAC
Overt/Major GI Bleeding

- Best managed as inpatient in hospital
- Standard resuscitation protocols
- NOAC should be held
- Antiplatelet Rx: review need per case
- Multidisciplinary consultation
- Urgent Endoscopic evaluation
- Angiographic embolization when needed
- **Reversal Agent for severe/life threatening bleeding**

Uncontrolled NOAC Associated GI Bleeding

- Topical thrombin & fibrin sealant
- Topical hemospray powder (n/a in USA)
- Systemic Tranexamic acid
- Prothrombin complex concentrate
- Recombinant activated factor VII
- Hemodialysis & Hemoperfusion (Dabigatran)
- **Reversal Agent for severe/life threatening bleeding**
- Surgery
Peri-endoscopic Management: NOAC

• Low risk procedure: may continue NOAC

• High risk procedure: interrupt NOAC
  – Consult with cardiologist
  – Knowledge of renal function
  – Develop plan for resumption
  – Discuss and document risks/benefits (office visit)

ANTIDOTES

• Aspirin: Platelet transfusion
• Warfarin: Vit K, FFP
• Heparin: Protamine Sulfate
• Clopidogrel: Platelet Transfusion
• Dabigatran: Idarucizumab
• Other NOACs: none yet
Especially Difficult Scenarios!!

- Jehovah’s Witness patient
- The “recalcitrant Cardiologist”
- The Cardiologist cannot be found!
- LVAD patients
- The patient with acute MI

Summary

- Low risk for bleeding from endoscopy AND High risk for cardiovascular/CNS event favors continuing antithrombotic agent.
- High risk for bleeding from endoscopy AND Low risk for Cardiovascular/CNS event favors holding antithrombotic agent.
- Variables: Duration of action of agent, availability of reversing agents, ability to more ‘easily’ control bleeding endoscopically, local expertise/resources all weigh in considerably
- Don’t under-estimate efficacy of endoscopic therapy!
All Bleeding Eventually Stops....!!!!!!

Thank You!