ACG Virtual Grand Rounds
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Week 16: Managing Complications of Cirrhosis
Mitchell L. Shiffman, MD, FACG
July 9, 2020 at Noon EDT

Week 17: High-Resolution Manometry: Thinking Beyond the Chicago Classification
John E. Pandolfino, MD, MSCI, FACG
July 16, 2020 at Noon EDT

Weeks 18, 19, 20 & Special Topics have also been added!
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Fellowship Education in the COVID Era
How Do We Move Forward?
TUESDAY, JULY 7th, 8 to 9:30 pm EDT

Presenters
- Douglas G. Adler, MD, FACG
- Jan-Michael Axel Klapproth, MD
- Laura E. Raffals, MD, MS, FACG
- Renee L. Williams, MD, MHPE, FACG

Panelists
- Nabil F. Fayad, MD, FACG
- Yolanda Rivas, MD

Moderators
- Jean-Paul Achkar, MD, FACG
- Immanuel K. H. Ho, MD, FACG

Visit gi.org/ACGVGR to Register
RACISM IN MEDICINE: SHIFTING CULTURE AND PRACTICE
Webinar: Monday, July 13th at 8 pm EDT  Register: gi.org/ACGVGR

Dr. Williams  Dr. Balzora  Dr. Gray
Ms. Abbott  Dr. Conwell  Dr. Oliva-Hemker  Dr. Pochapin

Virtual Grand Rounds

ACG 2020 Virtual
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Participating in the Webinar

All attendees will be muted and will remain in Listen Only Mode.

Type your questions here so that the moderator can see them. Not all questions will be answered but we will get to as many as possible.

How to Receive CME and MOC Points

LIVE VIRTUAL GRAND ROUNDS WEBINAR
ACG will send a link to a CME & MOC evaluation to all attendees on the live webinar.

ABIM Board Certified physicians need to complete their MOC activities by December 31, 2020 in order for the MOC points to count toward any MOC requirements that are due by the end of the year. No MOC credit may be awarded after March 1, 2021 for this activity.

ACG will submit MOC points on the first of each month. Please allow 3-5 business days for your MOC credit to appear on your ABIM account.
MOC QUESTION

If you plan to claim MOC Points for this activity, you will be asked to: Please list specific changes you will make in your practice as a result of the information you received from this activity.

Include specific strategies or changes that you plan to implement. THESE ANSWERS WILL BE REVIEWED.

Disclosures:

Moderator:
Seth A. Gross, MD, FACG
Dr. Gross has Nothing to Disclose

Speakers:
Aasma Shaukat, MD, MPH, FACG
Grant support from Iterative Scopes
Antithrombotic Agents and Endoscopic Procedures

Aasma Shaukat, MD, MPH, FACG
GI section Chief, Minneapolis VAMC
Professor of Medicine, University of Minnesota

Objectives

• To accurately assess the risk of bleeding in individuals on anti-thrombotic therapies undergoing endoscopy
• To understand the management of these agents in patients undergoing endoscopy

Special Thanks to: John Saltzman for his assistance
Major considerations for endoscopy and antithrombotics

- **Procedural risk factors**
  - Type
  - Interventions known or planned

- **Patient risk factors**
  - Underlying disease
  - Medications
    - Aspirin
    - P2Y$_{12}$ inhibitors
    - Warfarin
    - Direct oral anticoagulants

Risks of stopping or continuing anti-thrombotics for endoscopy

Bleed after endoscopy

- Usually treatable

Thromboembolic event

- Potentially devastating
Procedural bleeding risk

<table>
<thead>
<tr>
<th>TABLE 3. Procedure risk for bleeding (overall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher-risk procedures</td>
</tr>
<tr>
<td>Polypectomy</td>
</tr>
<tr>
<td>Biliary or pancreatic sphincterotomy</td>
</tr>
<tr>
<td>Treatment of varices</td>
</tr>
<tr>
<td>PEG placement</td>
</tr>
<tr>
<td>Therapeutic balloon-assisted enteroscopy</td>
</tr>
<tr>
<td>EUS with FNA</td>
</tr>
<tr>
<td>Endoscopic hemostasis</td>
</tr>
<tr>
<td>Tumor ablation</td>
</tr>
<tr>
<td>Cystgastrostomy</td>
</tr>
<tr>
<td>Ampullary resection</td>
</tr>
<tr>
<td>EMR</td>
</tr>
<tr>
<td>Endoscopic submucosal dissection</td>
</tr>
<tr>
<td>Pneumatic or bougie dilatation</td>
</tr>
<tr>
<td>PEJ</td>
</tr>
<tr>
<td>*PEG. Percutaneous endoscopic jejunostomy.</td>
</tr>
<tr>
<td>*PEG on aspirin or clopidogrel therapy is low risk. Does not apply to DAPT.</td>
</tr>
<tr>
<td>*EUS-FNA of solid masses on ASA/NASA is low risk.</td>
</tr>
</tbody>
</table>

- Size, morphology, polypectomy technique

Acosta RD, Abraham NS, Shaukat A, ASGE SOP. Gastrointest Endosc 2016;83:3-16

Patient Risk

**Low Risk Condition**
- Uncomplicated non-valvular atrial fibrillation
- Bioprosthetic valve
- Mechanical aortic valve
- Deep vein thrombosis

**High Risk Condition**
- Atrial fibrillation with
  - CHA₂DS₂-VASc score ≥4
  - Valvular/prosthetic disease
  - LVEF <35% or active CHF
  - HTN, diabetes
  - H/O thromboembolic event
  - Age > 75 years
- Mechanical mitral valve
- Mechanical valve with previous thrombotic event
- Recently placed coronary stent (<1 year)
- Acute coronary syndrome

Douketis JD, Spyropoulos AC, American College of Chest Physicians. Chest 2012;141:326-8
Acosta RD, Abraham NS, Shaukat A, ASGE SOP. Gastrointest Endosc 2016;83:3-16
Patient Risk: CHADS-VASc Score

<table>
<thead>
<tr>
<th>CHADS-VASc score or assessment</th>
<th>Risk of stroke (CVA)</th>
<th>Risk of annual CVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Moderate</td>
<td>1.3</td>
</tr>
<tr>
<td>2</td>
<td>High</td>
<td>2.2</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
<td>3.2</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>4.0</td>
</tr>
<tr>
<td>5</td>
<td>High</td>
<td>6.7</td>
</tr>
<tr>
<td>6</td>
<td>High</td>
<td>9.8</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
<td>9.6</td>
</tr>
<tr>
<td>8</td>
<td>High</td>
<td>6.7</td>
</tr>
<tr>
<td>9</td>
<td>High</td>
<td>15.2</td>
</tr>
</tbody>
</table>

CHADS-VASc: Congestive heart failure (1 point), Hypertension (1 point), Age ≥ 75 years (2 points), Diabetes mellitus (1 point), Stroke (2 points), Vascular disease (1 point), Age 65-74 years (1 point), Sex category, 1e, female sex (1 point).

CVA: cerebrovascular accident.

Endoscopy in patients on antiplatelet or anticoagulant therapy, including direct oral anticoagulants: British Society of Gastroenterology (BSG) and European Society of Gastrointestinal Endoscopy (ESGE) guidelines

<table>
<thead>
<tr>
<th>High risk</th>
<th>Low risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic polypectomy</td>
<td>Diagnostic procedures ± biopsy</td>
</tr>
<tr>
<td>ERCP with sphincterotomy</td>
<td>Biliary or pancreatic stenting</td>
</tr>
<tr>
<td>Sphincterotomy + large balloon papillary dilatation</td>
<td>Device-assisted enteroscopy without polypectomy</td>
</tr>
<tr>
<td>Ampullectomy</td>
<td></td>
</tr>
<tr>
<td>Endoscopic mucosal resection or endoscopic submucosal dissection</td>
<td></td>
</tr>
<tr>
<td>Endoscopic dilatation of strictures in the upper or lower GI tract</td>
<td></td>
</tr>
<tr>
<td>Endoscopic therapy of varices</td>
<td></td>
</tr>
<tr>
<td>Percutaneous endoscopic gastrostomy</td>
<td></td>
</tr>
<tr>
<td>Endoscopic ultrasound with fine needle aspiration</td>
<td></td>
</tr>
<tr>
<td>Oesophageal, enteral or colonic stenting</td>
<td></td>
</tr>
</tbody>
</table>

Endoscopy in patients on antiplatelet or anticoagulant therapy, including direct oral anticoagulants: British Society of Gastroenterology (BSG) and European Society of Gastrointestinal Endoscopy (ESGE) guidelines

Patient risk for DC anti platelet agent

<table>
<thead>
<tr>
<th>High risk</th>
<th>Low risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug eluting coronary artery stents within 12 months of placement</td>
<td>Ischaemic heart disease without coronary stents</td>
</tr>
<tr>
<td>Bare metal coronary artery stents within 1 month of placement</td>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td></td>
<td>Peripheral vascular disease</td>
</tr>
</tbody>
</table>


Anti-thrombotic medications

• Anti-platelet agents
  • Aspirin
  • Thienopyridines

• Anti-coagulant medications
  • Warfarin
  • Direct oral anticoagulants (DOAC)
Antiplatelet therapy

ASA

- Arachidonic Acid
  - COX-1 (constitutive)
    - ASA
    - Thromboxane A₂ (TXA₂)
    - Platelet Aggregation
  - ASA
    - Prostacyclin (PGI₂)

Thienopyridines

- Clopidogrel
- Prasugrel
- Ticagrelor

• ADP
  - GP IIb/IIIa
  - TXA₂

Platelet Aggregation

Aspirin

- Irreversible acetylation and inactivation of platelet cyclooxygenase

- Effect is for life of the platelet (7-10 days)

- Prolonged bleeding time for 48 hours and up to 8 days
Risk of bleeding with ASA

- No increase in bleeding for low risk procedures
- SR of 11 studies, 9307, Post polypectomy bleeding rate was not increased (OR 1.1; 0.6-2.1)
- Small increase in risk of delayed post polypectomy bleeding (OR 1.7; 1.2-2.2)


Risk of stopping ASA

- 613 studies; 50,279 patients
- 3-fold higher risk of CV event with ASA withdrawal (OR 3.14; 1.75-5.61)
- Magnified risk in those with coronary stents
- Median time 11 days

https://doi.org/10.1093/eurheartj/ehl334
**Risk of stopping ASA**

- ASA withdrawal precedes 10% of acute vascular syndromes

- Time between stopping ASA and acute event
  - 14.3 days for CVA
  - 8.5 days for acute coronary syndrome
  - 25.8 days for peripheral ischemia

---

**Management of Aspirin**

**Recommendation:** Continue ASA for all GI procedures

- Low GI Bleeding Risk: Continue ASA
- High GI Bleeding Risk
  - LOW Thromboembolic Risk: Consider: Continue ASA vs. discontinue X 5-7 d
  - HIGH Thromboembolic Risk: Continue ASA

---

**P2Y\textsubscript{12} inhibitors (thienopyridines)**

- Selectively inhibits ADP-induced platelet aggregation
- 40% to 60% inhibition of aggregation in 3 to 5 days

<table>
<thead>
<tr>
<th></th>
<th>Clopidogrel (Plavix)</th>
<th>Prasugrel (Effient)</th>
<th>Ticagrelor (Brilinta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanism</td>
<td>Irreversible</td>
<td>Irreversible</td>
<td>Reversible</td>
</tr>
<tr>
<td>Active vs. Inactive Pro-drug</td>
<td>Inactive prodrug CYP2C19 activation</td>
<td>Inactive prodrug CYP3A4 activation</td>
<td>Active</td>
</tr>
<tr>
<td>Drug Half-life</td>
<td>6 h</td>
<td>3.7 h</td>
<td>6-12 h</td>
</tr>
<tr>
<td>Platelet inhibition</td>
<td>7-10 d</td>
<td>7-10 d</td>
<td>1-2 d</td>
</tr>
</tbody>
</table>

**Risk of CV events versus bleeding**

- SR of 15 trials, 33,970 individuals
- Lower risk of fatal and non-fatal MI with clopidogrel plus aspirin compared with aspirin alone (RR 0.78, 95% CI 0.69 to 0.90)
- Lower risk of fatal and non-fatal ischemic stroke (RR 0.73, 95% CI 0.59 to 0.91)
- Higher risk of major bleeding with clopidogrel plus aspirin compared with aspirin alone (RR 1.44, 95% CI 1.25 to 1.64)

Risk of Post polypectomy bleeding with Clopidogrel

- 216 patients randomized to clopidogrel or placebo 7 days before polypectomy
- 80% on ASA

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Clopidogrel</th>
<th>Placebo</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed postpolypectomy bleeding</td>
<td>3.8 (1.4-9.7)</td>
<td>3.6 (1.4-9.4)</td>
<td>.945</td>
</tr>
<tr>
<td>Immediate postpolypectomy bleeding</td>
<td>8.5 (3.2-13.8)</td>
<td>5.5 (1.2-9.7)</td>
<td>.380</td>
</tr>
<tr>
<td>Serious cardio-thrombotic events</td>
<td>1.5 (0.5-4.7)</td>
<td>2.0 (0.8-5.4)</td>
<td>.713</td>
</tr>
</tbody>
</table>

Log-rank test: $P = .945$
Crude HR 1.05 (95% CI 0.20-4.20); $P = .946$

Chan FKL. *Gastroenterology* 2019;156:918-925

---

P2Y$_{12}$ inhibitors: Recommendations

<table>
<thead>
<tr>
<th>Procedure Risk Low</th>
<th>Procedure Risk High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient risk low</td>
<td>No adjustment</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient risk High*</td>
<td>No adjustment</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recent ACS or coronary stent
Warfarin

• Inhibits the production of the vitamin K dependent clotting factors:
  • II, VII, IX and X
• Inhibits proteins C and S
• Onset between 24 and 96 hours
• Transient reversal with fresh frozen plasma with duration based on half-life of factor VII (4 to 6 hours)
• Duration of action is 2 to 5 days
## Warfarin indications and risk of VTE

<table>
<thead>
<tr>
<th>Annual risk</th>
<th>Mechanical heart valve</th>
<th>VTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Any mitral valve prosthesis</td>
<td>Recent (within 3 months) VTE</td>
</tr>
<tr>
<td></td>
<td>Any caged-ball or tilting disc aortic valve prosthesis</td>
<td>Severe thrombophilia (deficiency of protein C, protein S, or antithrombin; antiphospholipid antibodies; multiple abnormalities)</td>
</tr>
<tr>
<td></td>
<td>Recent (within 6 months) CVA or TIA</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Bileaflet aortic valve prosthesis and one or more of the following risk factors: AF, prior CVA or TIA, hypertension, diabetes, congestive heart failure, age ≥ 75 years</td>
<td>VTE within the past 3-12 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nonsevere thrombophilia (heterozygous factor V Leiden or prothrombin gene mutation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recurrent VTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active cancer (treated within 6 months or palliative)</td>
</tr>
<tr>
<td>Low</td>
<td>Bileaflet aortic valve prosthesis without AF and no other risk factors for CVA</td>
<td>VTE &gt; 12 months previous and no other risk factors</td>
</tr>
</tbody>
</table>

*VTE, venous thromboembolism; CVA, cerebrovascular accident; TIA, Transient ischemic attack; AF, atrial fibrillation.*

---

## Endoscopy in patients on antiplatelet or anticoagulant therapy, including direct oral anticoagulants: British Society of Gastroenterology (BSG) and European Society of Gastrointestinal Endoscopy (ESGE) guidelines

### Patient risk for warfarin/DOAC bridging

<table>
<thead>
<tr>
<th>High risk</th>
<th>Low risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosthetic metal heart valve in mitral position</td>
<td>Prosthetic metal heart valve in aortic position</td>
</tr>
<tr>
<td>Prosthetic heart valve and atrial fibrillation</td>
<td>Xenograft heart valve</td>
</tr>
<tr>
<td>Atrial fibrillation and mitral stenosis*</td>
<td>Atrial fibrillation without valvular disease</td>
</tr>
<tr>
<td>&lt;3 months after venous thromboembolism</td>
<td>&gt;3 months after venous thromboembolism</td>
</tr>
<tr>
<td></td>
<td>Thrombophilia syndromes (discuss with haematologist)</td>
</tr>
</tbody>
</table>

*Uncertainty exists regarding the thrombotic risk of temporarily discontinuing warfarin in patients with atrial fibrillation and mitral stenosis following the BRIDGE trial [17], but there is insufficient evidence at present to alter the risk category.*

**Warfarin Recommendations**

If anticoagulation is temporary, delay procedure

<table>
<thead>
<tr>
<th>Procedure Risk Low</th>
<th>Procedure Risk High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient risk low</strong></td>
<td>• No adjustment</td>
</tr>
<tr>
<td></td>
<td>• INR should not be above therapeutic range</td>
</tr>
<tr>
<td><strong>Patient risk High</strong>*</td>
<td>• Discontinue 3-5 days prior to procedure</td>
</tr>
<tr>
<td></td>
<td>• INR goal is &lt;=1.5</td>
</tr>
<tr>
<td></td>
<td>• Restart warfarin evening of procedure</td>
</tr>
<tr>
<td><strong>Patient risk High</strong>*</td>
<td>• Discontinue 5 days prior to procedure</td>
</tr>
<tr>
<td></td>
<td>• Bridge with heparin or LMWH (or DOAC)</td>
</tr>
<tr>
<td></td>
<td>• Resume warfarin evening of procedure</td>
</tr>
<tr>
<td></td>
<td>• DC LMWH once INR therapeutic</td>
</tr>
</tbody>
</table>

*Prosthetic metal mitral valve, prosthetic valve+AF, AF and mitral stenosis, <3mo after VTE

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**Direct oral anticoagulants (DOACs)**

- Factor Xa or IIa (thrombin) inhibitors
- As effective as warfarin in preventing CVA in atrial fibrillation
- Oral fixed dose without coagulation management convenient
- Therapeutic anticoagulation within hours
- Normal coagulation within 24-48 hours after DOAC dose is held
Current DOACs

• Xa Inhibitors
  • Apixaban (Eliquis)
  • Rivaroxaban (Xarelto)
  • Edoxaban (Savaysa)
• IIa Inhibitor
  • Dabigatran (Pradaxa)

Pharmacodynamics of DOACs and Warfarin
Stopping DOACs before endoscopic procedure

<table>
<thead>
<tr>
<th>Drug (Creatinine Clearance)</th>
<th>Last dose prior to low-risk endoscopic procedure*</th>
<th>Last dose prior to high-risk endoscopic procedure**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dabigatran (&gt;50 mL/min)</td>
<td>1 day</td>
<td>2 days</td>
</tr>
<tr>
<td>Dabigatran (31-50 mL/min)</td>
<td>2 days</td>
<td>4 days</td>
</tr>
<tr>
<td>Dabigatran (&lt;30 mL/min)</td>
<td>4 days</td>
<td>6 days</td>
</tr>
<tr>
<td>Rivaroxaban/Apixaban/Edoxaban (&gt;50 mL/min)</td>
<td>1 days</td>
<td>2 days</td>
</tr>
<tr>
<td>Rivaroxaban/Apixaban/Edoxaban (31 to 50 mL/min)</td>
<td>1-2 days</td>
<td>3-4 days</td>
</tr>
<tr>
<td>Rivaroxaban/Apixaban/Edoxaban (&lt;30 mL/min)</td>
<td>2 days</td>
<td>4 days</td>
</tr>
</tbody>
</table>

DOACs compared to Warfarin for risk of Major GI bleeding

- Higher risk of GI bleeding events with Dabigatran and Rivaroxaban
- Similar risk with Apixaban

<table>
<thead>
<tr>
<th></th>
<th>Dabigatran 150 mg twice daily</th>
<th>Rivaroxaban 20 mg daily</th>
<th>Apixaban 5 mg twice daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients (n)</td>
<td>6076</td>
<td>7131</td>
<td>9088</td>
</tr>
<tr>
<td>Major GI bleeding (n)</td>
<td>223</td>
<td>224</td>
<td>105</td>
</tr>
<tr>
<td>Major GI bleeding (%/year)</td>
<td>1.85</td>
<td>2.00</td>
<td>0.76</td>
</tr>
<tr>
<td>Hazard ratio for major GI bleeding (vs. warfarin)</td>
<td>1.49 [CI 1.21–1.84]</td>
<td>1.61 [CI 1.30–1.99]</td>
<td>0.89 [CI 0.70–1.15]</td>
</tr>
</tbody>
</table>

Reversals for DOACs

• Can manage most with holding drug and IV hydration
• Measure the anticoagulation effect
  • Xa inhibitors—greater effect on PT
  • Dabigatran—greater effect on PTT
• Reversal agents available
  • Idarucizumab reverses dabigatran
  • Andexanet alpha reverses the Xa inhibitors
• Switch to an alternative DOAC after episode
  • Apixaban has a lower risk of GI bleeding

DOAC Recommendations

If anticoagulation is temporary, delay procedure

<table>
<thead>
<tr>
<th>Procedure Risk Low</th>
<th>Procedure Risk High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient risk low</td>
<td></td>
</tr>
<tr>
<td>• No adjustment</td>
<td>• Discontinue 2 days prior to procedure (normal renal function)*</td>
</tr>
<tr>
<td>• No need to check INR</td>
<td>• Restart 2 days after if hemostasis achieved</td>
</tr>
<tr>
<td>• Consider omitting DOAC morning of procedure</td>
<td></td>
</tr>
<tr>
<td>Patient risk High*</td>
<td></td>
</tr>
<tr>
<td>• No adjustment</td>
<td>• Discuss with Cardiologist/PCP</td>
</tr>
<tr>
<td>• No need to check INR</td>
<td>• Discontinue 2 days prior to procedure (normal renal function)*</td>
</tr>
<tr>
<td></td>
<td>• Consider bridging with heparin or LMWH</td>
</tr>
<tr>
<td></td>
<td>• Restart 2 days after</td>
</tr>
</tbody>
</table>

*For dabigatran and Cr Cl 30-50ml/min stop 72 hours prior
Post-polypectomy bleeding

- 0.3-6.1% of all polypectomies
- Most common colonoscopy complication
- Bleeding can be immediate or delayed
- If delayed, usually within 7 days but can be up to 29 days
- Bleeding severity ranges from mild oozing to active arterial bleeding
- Endoscopic control possible in majority


Risk benefit of interrupting anticoagulation for polypectomy

Risk of TE event if anticoagulation interrupted: 0.7-1%

Blacker D. Neurology. 2003 Oct 14; 61(7):964-8;

Risk of delayed bleeding not increased with polypectomy on anticoagulation

- 225 polypectomies (<=10mm) in 123 patients on anticoagulation
- 1 major bleeding event

Cold Snare Polypectomy on Anticoagulation is safe for polyps <=10mm

• 123 polyps in 71 patients on anticoagulation HSP vs CSP for polyps <=10mm
• Risk of delayed bleeding 14% vs 0%

• 184 patients randomized to CSP+Anticoagulation Vs. HSP+bridging
• PPB 12% vs. 4.7%

Horiuchi A. *GIE* 2009;79:417-23;

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Summary of Management

Acosta RD, Abraham NS, Shaukat A, ASGE SOP. *Gastrointest Endosc* 2016;83:3-16
Antithrombotic and endoscopy app

- App from UNC and Johns Hopkins for endoscopy


(Nutalapati V. Gastrointest Endosc 2019;90(6):906-912
http://www.endoaid.net/)
Take home points

• Most endoscopic procedures may be performed on patients taking standard dose aspirin
• For patients on dual anti-platelet agents, hold $\text{P2Y}_{12}$ inhibitors but continue ASA
• For patients on warfarin and DOACs
  • Discontinue and consider bridge if high risk for thrombosis
• DOACs have a rapid onset and offset, but an increased GI bleed risk and new reversal drugs
• For high risk patients for thromboembolism, restart meds as soon as possible (within 1-7 days)

Questions:

Moderator:
Seth A. Gross, MD, FACG

Speakers:
Aasma Shaukat, MD, MPH, FACG
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