Updates & Controversies in Perioperative Medicine

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Updates in Perioperative Medicine

New Guidelines for Perioperative Care:
  • Coronary stents in surgical patients
  • Bridging anticoagulation in atrial fibrillation
  • Evaluating patients with sleep apnea

New Studies on Old Problems:
  • Medical management of cardiac risk (statins)
  • Opiates use after surgery
Surgery After Drug Eluting Stent

Your 63-y.o. patient needs a hemicolectomy for colon cancer. He had a drug-eluting stent placed 4 months ago for stable angina.

What do you recommend?
1. Operate now
2. Operate now only if antiplatelet drugs can be continued
3. Wait 6 months after stent placed
4. Wait 12 months after stent placed

Perioperative Cardiac Complications in Patients with Coronary Stents

Question: How do stent type and time until surgery affect risk of cardiac complications?

Study Design: Retrospective cohort analysis
• Over 25,000 pts who had noncardiac surgery between 6 weeks & 2 years after BMS or DES placement
• Identify risk factors for cardiac complications (all-cause mortality, MI, revascularization)

**Effect of Stent Type & Time After Implantation**

Time of surgery after PCI didn’t matter after first 6 months

![Graph showing comparison of complications over time between PCI and surgery for Bare Metal and Drug Eluting stents.](image-url)


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**2016 ACC/AHA Guidelines for DAPT**

- Avoid PCI if antiplatelet drugs will need to be held prematurely

- Delay **elective** surgery after elective PCI:
  - Bare metal stent: 30 days
  - Drug eluting stent: 6 months (optimal)
  - 3 months (if harm in delay)

Management of Antiplatelet Drugs

ACC/AHA Guideline (2016):

If P2Y$_{12}$ inhibitor must be stopped, then ASA should be continued if possible, and the P2Y$_{12}$ inhibitor resumed postop as soon as possible

Evidence?

- Small case series and one case-control study
- No data that any strategy leads to fewer MI or bleeds
- Mostly just expert opinion

Childers CP et al. JAMA. 2017; 318(2):120-1

Managing Perioperative Anticoagulation

A 76-year-old woman with paroxysmal atrial fibrillation on warfarin underwent head & neck surgery for cancer two days ago. Warfarin is being restarted, and her surgeon asks whether she should be bridged with heparin.

- She has HTN & DM; CHA$_2$DS$_2$-VASc score = 5 (CHADS$_2$ = 3)
- Her labs are noted for Hgb = 8 g/dL and Platelet count = 88,000

1. **Bridge with heparin**
2. **Don’t bridge**
BRIDGE Trial

Patients:
- 1884 patients on warfarin for atrial fib or flutter
- CHADS-2 score ≥ 1
- Excluded patients with mechanical valve or stroke within 12 weeks and cardiac & neurologic surgery

Intervention:
- Randomized to bridging with LMWH or placebo

Outcome:
- 30-day risk of arterial thromboembolism & bleeding

Douketis JD et al. NEJM, 2015; 373:823-33

<table>
<thead>
<tr>
<th></th>
<th>Bridged</th>
<th>No Bridge</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Embolic Event</td>
<td>0.3%</td>
<td>0.4%</td>
<td>Non-inferior</td>
</tr>
<tr>
<td>Major Bleeding</td>
<td>3.2%</td>
<td>1.3%</td>
<td>NNH = 53</td>
</tr>
<tr>
<td>Minor Bleeding</td>
<td>21%</td>
<td>12%</td>
<td>NNH = 12</td>
</tr>
</tbody>
</table>

Douketis JD et al. NEJM, 2015; 373:823-33
BRIDGE Trial for Atrial Fibrillation

Conclusions:
- Bridging did not reduce risk of embolism
- Bridging increases bleeding risk

Caveats:
- Few patients with high CHADS-2 score (average = 2.3)

My take-away:
- Don’t bridge majority of atrial fibrillation
- Carefully consider bridging if stroke risk is very high (CHADS-2 score 5 or 6, rheumatic atrial fibrillation)

ACC Guideline for AF (2017)

General considerations:
- Continue anticoagulation if procedure has low or negligible bleeding and patient’s bleeding risk is normal
- No bridging needed with DOACs

Bridging decision based on both clotting & bleeding risk:
- CHA\textsubscript{2}DS\textsubscript{2}-VASc: 1-4 = low risk; 5-6 = mod; 7-9 = high
- Elevated bleeding risk: major bleed or ICH in last 3 months, platelets low or abnormal, aspirin use, supratherapeutic INR, or prior bleeding with bridging or similar surgery

Doherty et al. JACC, 2017; 69(7): 871–898
### ACC Guideline for AF (2017)

<table>
<thead>
<tr>
<th>Thrombotic Risk Level</th>
<th>Normal Bleeding Risk*</th>
<th>Elevated Bleeding Risk*</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Thrombotic Risk</td>
<td>Bridge</td>
<td>Clinical Judgment</td>
</tr>
<tr>
<td>CHA₂DS₂-VASc = 7+</td>
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</tr>
<tr>
<td>Mod Thrombotic Risk</td>
<td>Clinical Judgment</td>
<td>No Bridge</td>
</tr>
<tr>
<td>CHA₂DS₂-VASc = 5-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Thrombotic Risk</td>
<td>No Bridge</td>
<td></td>
</tr>
<tr>
<td>CHA₂DS₂-VASc = 1-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* **Bleeding risk elevated** if major bleed or ICH < 3 months, platelets low or abnormal, aspirin use, supratherapeutic INR, or prior bleeding with bridging or similar surgery

### Obstructive Sleep Apnea in Surgical Patients

A 55-y.o. morbidly obese man is scheduled to undergo knee arthroplasty. He has hypertension but no other medical history. He reports occasional fatigue and somnolence. He doesn’t know if he snores or has apneic spells. Exam and recent lab tests are unremarkable.

**What should be done?**
1. Notify surgical team of suspected OSA
2. Notify surgical team & recommend empiric CPAP postop
3. Delay surgery for formal polysomnography
OSA and the Surgical Patient

OSA probably increases postoperative complications:
• Pulmonary complications (11 of 17 studies)
• Postop atrial fibrillation (5 of 6 studies)

Previously undiagnosed OSA may be associated with more complications than known OSA

Clinical screening tests have high PPV

Benefits of positive airway pressure (CPAP, BiPAP) for surgical patients with OSA uncertain


Society of Anesthesia and Sleep Medicine Guidelines for Preoperative Evaluation

1. Screen patients clinically for OSA risk
   Snoring
   Tired or sleepy
   Observe apnea
   Pressure (HTN)
   BMI > 35 kg/m²
   Age > 50 years
   Neck > 17" (M)/16" (F)
   Gender is male

   STOP-BANG
   High risk for OSA if either
   • 5 or more total points
   or
   • 2 STOP points + B, N, or G

http://www.stopbang.ca/osa/screening.php
Society of Anesthesia and Sleep Medicine Guidelines for Preoperative Evaluation

2. Patient and care team should be informed about known or suspected OSA

3. Insufficient evidence to recommend delaying surgery to perform advanced testing (polysomnography)
   Exception: patients with evidence of severe or uncontrolled systemic complications of OSA or impaired gas exchange (e.g., severe pulm HTN, hypoventilation, resting hypoxia)

4. Continue PAP after surgery
   Insufficient evidence to recommend empiric PAP

Preventing Postoperative Myocardial Ischemia & Infarction

You perform a preoperative evaluation on your colleague’s patient prior to a femoral-popliteal arterial bypass scheduled for next week.

The patient is a smoker and has diabetes and PAD. His only medication is glyburide.

What would you do now:
1. Start aspirin
2. Start metoprolol
3. Start atorvastatin
4. Wonder what’s up with my colleague
Strategies to Prevent Postoperative MI

- Stress from surgery
  - Sympathetic tone
  - Catecholamines
  - Increased HR & BP
  - Unstable plaque
  - Myocardial ischemia / infarction

- Beta-blocker
- Clonidine
- Statin
- Aspirin
- Revascularization

Rise & Fall of Beta-blockers

- Early studies showed that perioperative beta-blockers prevented postoperative MI and reduce mortality

- Subsequent studies less impressive, and some positive studies discredited for fraud

- Largest study found small benefit on MI prevention, but increased overall mortality
2014 ACC / AHA Guideline

Only recommendation to use if… (1)
- Already using β-blocker to treat angina, HTN, arrhythmia

Not unreasonable to consider initiation if… (2b)
- High clinical risk (e.g., RCRI score ≥ 3)
- Ischemia seen on preoperative stress test

Avoid initiation… (3)
- On day of surgery


POISE 2 Trial: Aspirin & Clonidine

- POISE 2: Large 2 x 2 RCT comparing perioperative treatment with aspirin, clonidine, both, or neither

- Aspirin did not prevent death or MI, but increased bleeding complications

- Clonidine did not prevent death or MI, but increased clinically significant hypotension & bradycardia
2014 ACC / AHA Guidelines

Aspirin (for patients without stent) & Clonidine

- Initiation of ASA **does not benefit** patients undergoing elective noncardiac surgery
- Alpha-2 agonists for prevention of cardiac events are **not recommended** in patients who are undergoing noncardiac surgery


Preoperative Coronary Revascularization

- CARP trial randomized patients with coronary disease to revascularization (PCI or CABG) or medical management alone before major vascular surgery
- Revascularized patients had higher **preoperative** complications
- No reduction in postoperative mortality or MI
2014 ACC / AHA Guidelines

Preoperative Coronary Revascularization

- Recommended for independent guideline-concordant indications only
- Not recommended exclusively to reduce perioperative cardiac events


Trial of Statins in Vascular Surgery

- 497 statin naive patients s/f vascular surgery
- Randomized to Fluvastatin XL or placebo 1 month before OR

Reduced nonfatal MI

No difference in rates of LFT or CPK elevation

Schouten et al. NEJM, 2009; 361:980-9
Statins & Noncardiac Surgery

Study Design:
- Observational cohort study of 180,478 VA patients having noncardiac surgery
- 96,486 patients included in propensity-matched cohort
- Measured association between “early treatment” with statin (day of surgery or POD 1) with postoperative mortality and complications

doi:10.1001/jamainternmed.2016.8005 Published online

Statins & Noncardiac Surgery

Early statin use (POD 0 or 1) associated with:
- Lower all-cause 30-day mortality [RR 0.82; NNT 224]
- Fewer cardiac complications [RR 0.73; NNT 335]
- Reduced total complications [RR 0.82; NNT 67]
  (Respiratory, infection, renal but not stroke, thrombosis)

Dose effect detected:
- Moderate-high intensity statin dose associated with better outcomes than low intensity dose

Caveat:
- Retrospective, potential for confounders

doi:10.1001/jamainternmed.2016.8005
2014 ACC / AHA Guideline (Statins)

Definitely continue if… (Class I)
- Patient is already taking statins chronically

Reasonable to initiate if… (Class 2a)
- Patient is having vascular surgery

Not unreasonable to initiate if… (Class 2b)
- Patient has elevated clinical risk and is undergoing a moderate or high risk operation


Opiate Use after Surgery

Background:
- Growing concern about overuse of opiates, especially for chronic, non-cancer pain
- Less concern about opiate use for acute pain
- Little attention to opiate use to treat postoperative pain
- ~ 100 million operations per year (inpatient & ambulatory) means a large risk pool
New Chronic Postop Opiate Use

Question: What is the risk of new persistent opiate use after surgery?

Study design:
- 36,177 surgical patients having one of 13 common operations (80% minor surgery, no ortho/spine cases)
- Only studied opiate naïve patients (no opiate rx for 12 months prior to perioperative period)
- Determine incidence and risk factors for persistent opiate use more than 90 days after surgery

Chronic Opiate Use after Surgery

Findings:
- Overall 6% incidence of new persistent opiate use
  - Similar for major & minor surgery
- Risk factors for developing chronic use:
  - Alcohol, tobacco, drug use
  - Higher baseline comorbidity
  - Anxiety & mood disorder
  - Other pain (back, neck, arthritis)
How Much is Enough?

Question: What is the optimal duration of a discharge prescription for opiates after surgery?

Study design:
- 215,140 patients having general, musculoskeletal, or women's health surgery
- All patients were opiate naïve (no rx for prior 6 months)
- Compared duration of discharge opiate prescription against need for a refill

Scully RE et al. JAMA Surg 2017

Prescribing Practices & Need for Refill

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>Duration of Initial Rx</th>
<th>Need for Refill</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Surgery</td>
<td>4-5 days</td>
<td>11-14%</td>
</tr>
<tr>
<td>- Appy, Chole, Inguinal hernia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>5-7 days</td>
<td>30-39%</td>
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<tr>
<td>- ACL, Rotator cuff, Discectomy</td>
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<td></td>
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<tr>
<td>Women’s Health</td>
<td>4-5 days</td>
<td>17% (hyster) 32% (mast)</td>
</tr>
<tr>
<td>- Mastectomy, Hysterectomy</td>
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</tbody>
</table>
Prescribing Practices & Need for Refill

The optimal length of opioid prescription after common surgical procedures likely lies between the observed median prescription length and the early nadir in the modeled probability of refill.

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>“Optimal Duration”</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Surgery</td>
<td>4 - 9 days</td>
</tr>
<tr>
<td>- Appy, Chole, Inguinal hernia</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>6 -15 days</td>
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<tr>
<td>- ACL, Rotator cuff, Discetomy</td>
<td></td>
</tr>
<tr>
<td>Women’s Health</td>
<td>4 -13 days</td>
</tr>
<tr>
<td>- Mastectomy, Hysterectomy</td>
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Conclusions

- If DAPT must be stopped, delay elective surgery for 6 mo after DES implantation (3 months if surgery is time-sensitive)
- Bridging anticoagulation not indicated for most patients with atrial fibrillation (and probably mechanical valves)
- Screen patients for OSA, but not necessary to delay surgery
- Consider starting statin in patients with increased cardiac risk before surgery
- Prescribe opiates after surgery with caution, especially in presence of substance abuse and chronic pain

Thank You

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