

Rocky Mountain Hospital
Medicine Symposium –
Perioperative CV Complications

October 7, 2011
Brian Wolfe, MD

78 yo ♂ with no h/o SVT develops atrial fibrillation on POD#1 from a hip fracture surgery.
Asymptomatic except for surgical site pain
PMH: COPD/asthma, BPH
Exam: HR 105, BP 125/76 Labs: hgb 8.0gm/dl

- 1) Start IV heparin, IV metoprolol, obtain echo
- 2) Start oral or IV metoprolol or diltiazem and monitor vitals closely
- 3) Transfuse 2 units of pRBCs and monitor vitals
- 4) Start oral metoprolol, IV heparin, and plan for long-term anticoagulation with warfarin

Postoperative atrial fibrillation:
cardiac surgery

- Most data derived from CABG/valve patients where risk is high (15%/40%)
- Associated with short/long term morbidity and mortality
- Multiple preventive agents/strategies: BB's, amio, ARBs, NAC, pacing
- Evidence for long term stroke risks and guidance with regard to anticoagulation

Postoperative atrial fibrillation: non-cardiac surgery

- Little data, from observational trials
- Less frequent and highly-surgery dependent:
 - risk in thoracic surgery patients – 12%
 - risk in non-cardiothoracic patients – 3%

Postop Afib – noncardiothoracic pts

Obs study of ~14000 non-cardiothoracic pts

- 51 patients developed postop afib (0.37%)
- 2/3's had previous cardiac history
- 9 of 10 had a fluid balance >2Liters positive
- 2/3's had K <4.0 or Mg <2.0
- 30d mortality-12%, mostly multi-organ failure

Obs study of ~7700 Korean non-cardiothoracic pts

- Similar incidence and mortality to above cohort
- Higher LOS (34 vs. 13) in pts with afib

Christians KK, et al. Postop Afib in noncardiothor surg pts. *Amer J Surg* 2001;182:713-5.
Sohn GH, et al. Incidence and Predictors of Postop afib. *Kor Circ J* 2009;29:100-4.

Should we anticoagulate?

- Balance between increasing postop bleeding and thrombosis
- No prospective data
- Obs trial of 200+ thoracic surg pts who were anticoag with AF c/w 500+ who were not
- No difference in stroke but significant increase in bleeding



2006 ACC/AHA/ESC
postop atrial fibrillation guidelines

Class I <i>Strong recommendations</i>	Class IIa <i>Weak recommendations</i>
AV nodal blocking drugs recommended to achieve rate control in pt who develop postoperative AF <i>(Level of Evidence: B)</i>	Cardioversion with DCCV or ibutilide in pts with postop AF as advised for non-surgical patients. <i>(Level of Evidence: B)</i>
	Anticoagulation is reasonable as recommended for non-surgical patients. <i>(Level of Evidence: B)</i>

Conclusions

- Post op Afib rare in noncardiothoracic pts
- When it occurs, risk of mortality high, look for bleeding and sepsis
- Manage with rate vs. rhythm control as with other afib patients
- Consider anticoagulation for prolonged afib (>24-48hours) but consider bleeding risks carefully

67 yo ♀ with HTN, DM II and CKD 3 who is POD#0 (in PACU) from a right THR. Currently pain free. VS- 36.5, HR 88, BP 110/75, 95%2L
Preop she could not exercise 4 METs and her ECG showed only some non-specific T wave changes
What would be the best strategy to monitor for postoperative CV complications?

- 1) Continuous telemetry
- 2) ECG now and then daily x 2 days
- 3) ECG now and then daily x 2 days and troponins on POD#1 and #2
- 4) Normal physical exam and vitals monitoring, with ECG/troponins for ischemic symptoms

Postoperative Ischemic Surveillance

- 2007 ACC/AHA guidelines give a IIb, C (weak recommendation, poor evidence) troponin surveillance not well-understood nor recommended
- ↑troponins = ↑morbidity/mortality short/intermed/long term vascular (high risk) and non-vasc surgery
- What do we do with the data?

Perioperative Myocardial Infarction

- Cohort study of patients enrolled in POISE trial
- Multi-center study of 8300 pts in 23 countries with CV risk factors undergoing non-cardiac surgery
 - Periop MI (PMI) was defined as a rise in biomarkers **plus** evidence of ischemia by ECG, symptoms, pathology
 - 5% reached endpoint of PMI
 - 12% of those with a PMI died within 30 days
 - Compared with 2.2% in the remainder of cohort

Devereaux et al. Characteristics and short-term prognosis of PMI in pts undergoing non-cardiac surgery *Ann Int Med* 2011;154:523-28.

Perioperative Myocardial Infarction

- 65% of pts with a PMI had no symptoms (PMI diagnosed by biomarkers and ECG)
- Mortality did *not* differ among patients with and without symptoms
- 8.3% had isolated elevated troponins but no PMI
 - This group had increased CV events and death compared with those without biomarker elevations
- Pts with PMI were more likely to be alive if taking Aspirin or Statins

Devereaux et al. Characteristics and short-term prognosis of PMI in pts undergoing non-cardiac surgery *Ann Int Med* 2011;154:523-28.

Back to our patient...

- 1) Continuous telemetry
- 2) ECG now and then daily x 2 days
- 3) ECG now and then daily x 2 days and troponins on POD#1 and #2
- 4) Normal physical exam and vitals monitoring, with ECG/troponins for ischemic symptoms

67 yo ♀ with HTN, DM II and CKD 3 who is POD#1 from a right THR. She is c/o severe hip pain but no chest pain or dyspnea. No biomarkers drawn VS- 39.0 HR 105, BP 100/55, SaO2 90% 3L Regular, tachy, soft murmur, Rales in bottom 1/4 Yesterday's hgb 9.0, She received 3 liters fluid and 2 units of blood intra/postoperatively. Next step?

- 1) Check CXR and UA, consider empiric Abx for pneumonia/UTI
- 2) Give IV lasix and f/u signs & symptoms
- 3) Check ECG/Trop/hgb, improve pain control, give acetaminophen
- 4) Start oral metoprolol for tachycardia

Perioperative Myocardial Infarction

Type 1 PMI – occurs anytime in 2 wks postop

- Plaque Rupture
- Unpredictable based on angiographic appearance
- Prothrombotic milieu
- Increased sympathetic tone

Type 2 PMI – occurs in first 72hrs postop

- Mismatch of Oxygen Supply and demand
- Fixed coronary lesions
- Assoc with postop tachycardia
 - ST depressions present often on continuous ECG

Thygesen et al. Universal Definition of MI.
Circulation 2007, 116:2634-2653:

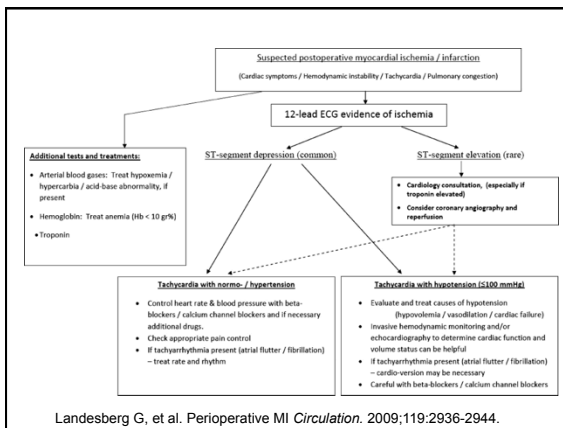
Perioperative Ischemia and Infarct

Relationship b/w ST depressions and infarction
151 patients undergoing vascular surgery

- >2h of ST depressions preceded 85% of PMI
- In multivariate analysis, ST-depressions only significant factor predictive of PMI
- Conclusion- subendocardial ischemia is most common etiology associated with PMI

Other studies have showed HR's associate with ST-depressions, ischemia and infarction

Landesberg G, et al. Importance of long-duration postop ST-seg depression in cardiac morbidity after vasc surg. *Lancet*. 1993;341:715-719



Landesberg G, et al. Perioperative MI *Circulation*. 2009;119:2936-2944.

Back to our patient...

67 yo ♀ with HTN, DM II and CKD 3 who is POD#1 from a right THR. She is c/o severe hip pain but no chest pain or dyspnea VS- 39.0 HR 105, BP 100/55, SaO2 90% 3L Regular, tachy, soft murmur, Rales in bottom 1/4 Yesterday's hgb 9.0, She received 3 liters fluid and 2 units of blood intra/postoperatively.

Thank you
