How Sick is Too Sick?  
Case #2

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September 10, 2016 WSA

Background

Admitting diagnosis:  
• Right upper lobe lung mass

Proposed Procedure:  
• Flexible bronchoscopy,  
• Endobronchial ultrasound (EBUS)  
• Internal right paratracheal lymph node biopsy

Background

Patient history - 55 year old female

PMH  
• Chronic systolic CHF & diastolic dysfunction  
  • 4/15 - 7 months prior to DOS - LVEF 25%, G2 diastolic dysfunction, eccentric pattern of chamber enlargement (remodeling)  
  • Hist of CAD  
  • LAD anterior MI 2006, complicated by VF arrest, s/p dual chamber ICD & pacer  
• Severe COPD  
  • 2013 PFTs with FEV1 86% of predicted  
  • Chronic respiratory failure (hypercapnic and hypoxemic)  
  • O2 dependent - non compliant  
  • With acute resp failure requiring intubation 6 months prior  
• Chronic back pain  
  • Opioids & NSAIDs
Background

Medications:
- **COPD:**
  - Advair
  - Albuterol prn
  - Nicotine patch
- **CAD/CHF:**
  - Carvedilol (12.5 mg bid) – taken on day of surgery
  - Lisinopril (2.5 mg qhs) – taken day prior to surgery – more than this caused symptomatic hypotension
  - Furosemide (40 mg qd) – taken day prior to surgery
  - Atorvastatin (80 mg qhs) – taken day prior to surgery
  - Aspirin (325 mg qd) – taken 2 days prior to surgery
- **Chronic back pain:**
  - Vicodin 1 qday prn (usually takes qhs)
  - Ibuprofen 200-800 mg q8 prn

Past airway history:
- Easy intubation (RSI) for “anesthesia stat” while in cardiac ICU for decompensated HF 6 months prior to proposed procedure
- Stable hypotension after induction dose of etomidate

Social history:
- Currently smoking
- Working in retail setting – can’t use oxygen at work and keep her job
- <4 mets but able to do ADLs

Indication for intervention
- 3.1 cm cavitary lesion in right upper lobe – FNA performed 6 days prior to surgery showed squamous cell carcinoma
- Her treatment will require medical oncology and radiation oncology depending on her final diagnosis of stage and disease
- If paratracheal node is positive recommendation for chemoradiation
- If paratracheal node is negative recommendation for stereotactic body radiation (SBRT)
It’s the day before surgery

• Call in sick?
• Tests? Consultants?

Even worse...

Preoperative Exam

• SpO2 80% on RA – placed on oxygen
• NIBP – 80/45 – asymptomatic
• Physical exam; poor dentition, chipped & missing teeth, chronically ill appearing, temporal wasting, no acute distress, talking easily
  • Deemed ASA IV

Further workup?

• Is she medically optimized for this procedure?
• Are any other diagnostic tests indicated?
  • Would they change your management?
• Is this procedure safe to perform on this patient in an ambulatory surgery center?
Counselling of patient?

- Scoring calculators?
  - Post op resp failure calculation 8-19% based on Gupta calculator
- Specifically discussed possibility of post operative resp failure with patient, need for ICU verses general care admission
  - Patient very resistant to admission, wants to get home to family

Monitors, Lines, Airway?

Outpatient Ambulatory Surgery Center Patient Selection: *contraindications at the University of Wisconsin*

**Social:**
- “Poor psycho-social situation making post op care questionable”

**Cardiac:**
- “EF < 30%”

**Pulmonary:**
- “Significant likelihood of postop intubation/ventilator support”
- “Severe lung disease”

**Types of Surgery/Monitoring:**
- “Cases where invasive monitoring is anticipated”
Contraindications to surgery

• Patient related factors:
  • Patient disease – multiple end stage diseases
  • Non compliance with oxygen, and recommendations of multiple physicians

• Ambulatory surgery center:
  • The incidence of perioperative morbidity and mortality was 0.1 percent (1 in 1,053 cases)
  • Independent risk factors for increased perioperative morbidity, after controlling for surgical complexity:
    • High body mass index (BMI),
    • Chronic obstructive pulmonary disease,
    • History of transient ischemic attack/stroke,
    • Hypertension,
    • Previous cardiac surgical intervention
  • and prolonged operative time
  • Other risk factors:
    • Surgery > 1 hour
    • ASA >=3
    • Advanced Age > 80
    • Increased BMI

Review of Literature

• Risk factors for postoperative pulmonary complications:
  • Definite risk factors
    • Age ≥ 60
    • COPD
    • Poor general health status (ASA ≥ 3)
    • Diabetes
    • OSA
    • Current cigarette use
    • Pulmonary hypertension
    • Low oxygen saturation
    •慢性贫血 (< 13 g/dl)
    • Intrathoracic surgery
    • Use of pancuronium
  • Urologic, orthopedic, vascular, head and neck, neurosurgery, and abdominal aortic aneurysm surgery
• Risk factors for postoperative pulmonary complications:
  • Probable risk factors:
    • general anesthesia (compared to spinal or epidural anesthesia)
    • PaCO2 > 45 mmHg
    • abnormal chest radiograph
    • cigarette use within the previous eight weeks
    • current upper respiratory tract infection.
  • ARISCAT (Canet) preoperative pulmonary risk index
    • Weighted score to 7 independent risk factors: 13.3% pulmonary complication rate:
      • Advanced age
      • Low preoperative oxygen saturation
      • Respiratory infection within the past month
      • Preoperative anemia
      • Upper abdominal or thoracic surgery
      • Surgery lasting more than two hours
      • Emergency surgery
• Intraoperative course
  • Standard ASA monitors
  • Induction of GA:
    • 2 mg midazolam, 100 mg lidocaine, 50 mcg fentanyl, 15 mg ketamine, 30 mg propofol
    • Neuromuscular blockade with 100 mg succinylcholine & 15 mg neomycin
  • Maintenance with sevoflurane:
    • (no more than 0.7%)
  • Pre-extubation:
    • confirmed 4/4 TOF
    • EtSEV: 0% for 15 minutes prior to extubation
    • RSBF: around 40
    • SpO2 95% on 100%
    • airway reflexes, brow furrow, did NOT follow commands briskly
Intraoperative record

Other drugs administered:
- 0.2 mg glycopyrolate
- 15 mcg epinephrine
- 4 mg ondansetron

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Background

- **Procedural Details:**
  - Hypotension, essentially unresponsive to treatment
  - Flexible bronchoscopy, BAL, EBUS with FNA aspiration of level 7 and 4R node
  - "Moderate somewhat purulent secretions found on left side"
  - TOF 4/4, given 3.5 mg (48 mcg/kg) neostigmine for reversal of NBMD
  - 15 mg rocuronium!

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Background

- **Management of complication – respiratory failure:**
  - Post extubation, monitored in OR, called PACU for NIPPV
  - Minimally responsive, taken to PACU
  - Needed jaw thrust, and full face mask
  - ABG 1:2, EPAP 4, increased FiO2 down to 50% eventually with SpO2 > 97%
  - Attempted ABG 2:2, unable to draw adequate supply + hemotoma – abandoned
  - Attempted placement of oral airway after around 2 hours of BiPAP "parked up" and she became alert and transitioned to Bl. Blow by CPAP (Auto pressure)
  - CXR – negative for PTX, massive aspiration
  - Strangely requested thoracic team to consider admission – they agreed:
    - Talked to bed control for ICU bed
    - Thoracic consulted hospitalist team for management of COPD exacerbation
Background

• Acute on Chronic respiratory failure: My notes:
  • Refused admission
    • "After about 2 hours of BiPAP, patient much more awake, watching TV, demanding diet coke and to leave the hospital. States she is not an idiot and will supplement her oxygen as she needs. Her Spo2 is still 86-88% on 5 L NC. I think it is somewhat risky to allow her to leave the hospital as she is still at high risk for postoperative resp failure, but she has received no sedating medications since leaving the operating room."
  • Post operative note:
    • "Refused patient to wear O2 to maintain Spo2 88-92%. On 2L NC, and has oxygen at home. Discussed high risk for respiratory failure, but she is insistent on leaving and competent to make her own decisions. No questions or concerns to regard her anesthesia care"

• Subjectively passed eyeball test
  • that is she looked similar to her appearance preoperatively.

Background

• Thoracic note:
  • The patient was noted to have respiratory failure with difficulty maintaining O2 saturations above 80%. She was started on continuous BiPAP with RT aid, was given albuterol nebulizer treatment, and was noted to have marked improvement in saturations to 85-88%. She was transitioned to nasal cannula and observed for another 1.5 hours, during which time she was 85-88% O2 saturation on 2l NC. She was advised to stay one night for observation in the hospital, but she adamantly refused and is noted to competent to make medical decisions. She has home oxygen supplementation, which she was advised to continue even when asleep, and was provided with an O2 tank by RT prior to discharge.

Background

• Per nursing notes:
  • "Pt. Alert, oriented x4, denies any distress or pain. Respiratory status same as pre-procedure. Thoracic surgeon recommended multiple times to pt. And her mom about admitting pt. For observation overnight. Pt. adamantly and vehemently declined each time. Pt. Has home O2, we provided our large oxygen tank on wheels for the ride home. Pt. Promised she will keep her oxygen on nonstop overnight. Pt. Had a light toast and drank diet coke. Pt. has an appointment on Wednesday next week with thoracic surgeon. Anesthesia also ok to D/C home. No new scripts provided."
  • Time in PACU > 5 hours
Background

• Hospitalist note:
  • Patient is a 55 year old female with history of PMH of severe COPD and lung cancer with mildly exacerbation of COPD likely form anesthesia and procedure
  • Recommendations:
    • Given the pt is rapidly improving it is not unreasonable to monitor her in recovery for 40mins or so to see if she comes back to her baseline considering she refuses to be admitted for observation
    • If she were to stay for monitoring she should be admitted under thoracic surgery given her recent procedure with hospital medicine consultation for continued use of nebulizers and possible steroids

Postoperative course

• Patient died at home:
  • Per verbal report: Got home, removed her NC oxygen, went inside and then became unresponsive
  • Suspect acute on chronic hypoxic respiratory failure resulting in cardiac event compounded with her ischemic cardiomyopathy

How sick is too sick?