

Pre-op Clinical Triad - Pulmonary

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Disclosures

- none

Case

Mr. G is a 64 year-old man who presents to your office for preoperative evaluation for upcoming right total knee arthroplasty for treatment of severe osteoarthritis refractory to conservative measures. Significant medical issues include obesity (BMI 38), chronic kidney disease stage 2, COPD, diabetes mellitus type 2, hypercholesterolemia, and hypertension. He presents reporting that he has had some left-sided, intermittent, sharp chest pain for the past 3 months. The pain lasts for 30 seconds or so at a time and happens randomly without inciting or alleviating factors. There is no association with exertion or with oral intake. It occurs about three times per week. He denies any nausea or diaphoresis associated with the pain as well as any radiation to the neck or arm. Otherwise, he denies any lower extremity edema, palpitations, orthopnea, PND, neurologic symptoms, or presyncope. His COPD is typically fairly well-controlled on his current regimen. However he reports he sometimes forgets to use his daily inhaler. He says he quit smoking 8 years ago but continues to smoke “socially” which he says is less than 15 cigarettes per week. He requires no oxygen but has had two exacerbations in the past year, one of which required hospitalization. Most of the time, he is able to perform the majority of his daily activities without dyspnea, but becomes dyspneic with more strenuous exertion, including brisk walking up inclines. He does note that he feels sleepier during the day than he used to and that his wife has been complaining about his loud snoring. When asked, he denies that she has noticed him stop breathing during sleep. He comes to the office for his regular diabetic visits and has a recent Hgb A1C of 7.2. He started seeing a nephrologist in the past two years when his Cr reached 1.8 and has not been to them lately due to nephrology office cancellations.

Case – Pulmonary key points

- Total knee arthroplasty
- Obesity (BMI 38)
- COPD
- Sometimes forgets to use his daily inhaler
- Quit smoking 8 years ago but continues to smoke “socially”
- Two exacerbations in the past year, one of which required hospitalization
- Dyspnea with more strenuous exertion, including brisk walking up inclines.
- Feels sleepier during the day than he used to and wife has been complaining about loud snoring.

Perioperative Pulmonary Risk

No single standardized risk stratification models though there are a couple of scoring systems for patients undergoing thoracic surgery.

Site of Surgery

- thoracic
- abdominal
- other

Type of anesthesia

- general
- epidural
- regional nerve block +/- moderate sedation
- multimodal analgesia

Postoperative Pulmonary Complications

Nosocomial pneumonia

Lobar or whole lung atelectasis

Pulmonary embolism

ARDS

Bronchospasm

Aspiration pneumonitis

Postoperative Pulmonary Complications

Patient Related Risk Factors:

- COPD
- Age
- Inhaled tobacco use
- Pulmonary hypertension (NYHA class 2 symptoms or worse)
- OSA (moderate to severe)

Postoperative Pulmonary Complications

Intraoperative Risk Factors:

- Surgery site (thoracic or abdominal)
- Duration of surgery
- General anesthesia
- Use of long acting neuromuscular blockers
- Emergency surgery

Role of PFTs

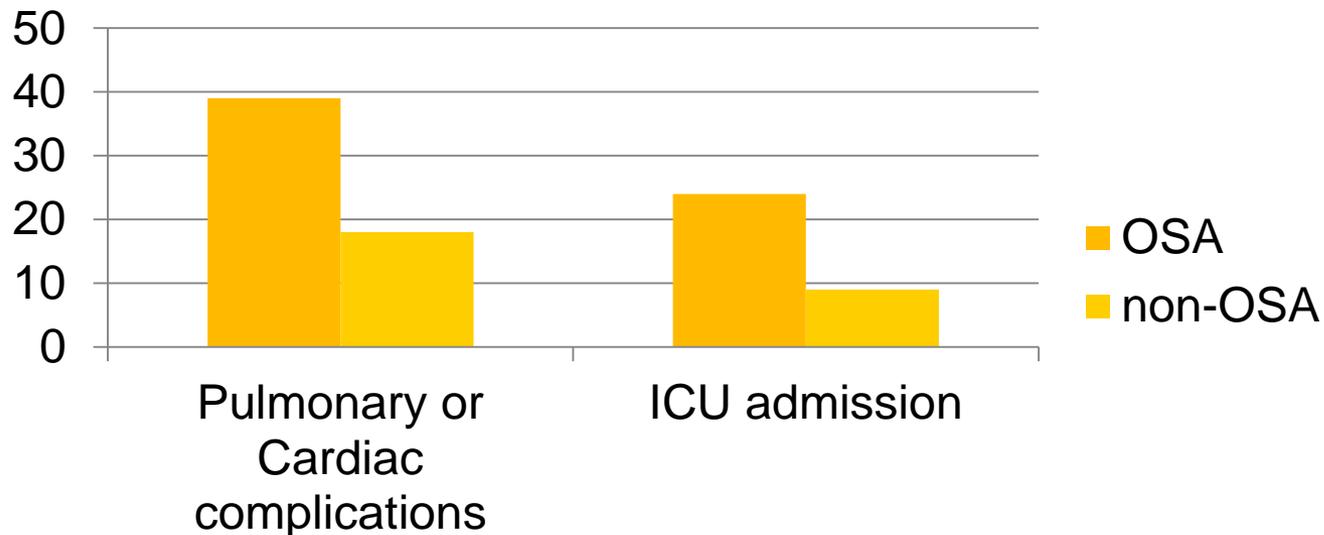
- Primary role of PFTs is to establish presence of obstructive disease or possibly restrictive physiology.
- Other than for lung resection probably no role for PFTs prior to surgery
- 2006 ACP Guidelines recommend against routine PFTs for noncardiothoracic surgery

Sleep Disordered Breathing

- Patients with obstructive sleep apnea have a higher incidence of (mainly respiratory) postoperative pulmonary complications than those without OSA.

Sleep Disordered Breathing

- In those undergoing hip or **knee replacements**, 39% of patients with OSA developed postoperative pulmonary complications or cardiac complications compared to 18% of patients without OSA; 24% of the patients with OSA required intensive care unit admissions compared to 9% of patients without OSA.



Postoperative complications in patients with obstructive sleep apnea syndrome undergoing hip or knee replacement: a case-control study. *Mayo Clin Proc* 76(9):897– 905, 2001.

Sleep Disordered Breathing

- The use of standardized questionnaires such as the STOP (*Snoring, Tiredness during daytime, Observed apnea, high blood Pressure*) and STOP-Bang (*Body mass index, Age, Neck circumference, Gender*) forms have been validated in the perioperative setting and provide a simple and useful screening tool for OSA.
- Current studies suggest that diagnosis and treatment of OSA can improve postoperative outcomes.

Risk of inpatient exacerbation

If patient has asthma or COPD and is well controlled prior to surgery the likelihood of a postoperative asthma or COPD exacerbation is low.

For patients with known sleep apnea, they should bring their home machines to the hospital with them for post-operative use.

Other Optimizing Measures

Tobacco cessation – data is inconsistent.

One of the largest trials in thoracic surgery patients found no difference in complications between active smokers and those who had quit within two months of surgery. Subsequent studies have shown the same.

Smoking cessation should be encouraged in general

Other Optimizing Measures

Obesity. More than 65% of Americans are overweight or obese.

There is evidence that obesity is an independent risk factor for worse perioperative outcomes in many types of surgery.

Other Optimizing Measures

Medication optimization.

Inhaler medication types for COPD

- Long acting muscarinic antagonist (LAMA)
- Long acting beta agonist (LABA)
- Corticosteroid

Recent advent of once daily LAMA/LABA combination inhalers

Pulmonary rehab

Back to our Patient . . .

Specific recommendations:

- No need for PFTs.
- Refer patient to Sleep Medicine Specialist for polysomnography
- Adjust inhaler regimen to combination LAMA/LABA given current wheezing and admission to hospital for COPD in last year
- Counsel on complete tobacco cessation
- Counsel on weight loss
- Discuss with anesthesiologist to see if patient is a candidate for regional anesthesia

Thank you!



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