

Non-Cardiac Chest Pain and Shortness of Breath

Assumption

The student understands thoracic and cardiac anatomy and physiology including esophageal motility, and is able to interpret chest radiographs and ECGs.

Goals

The student will be able to identify the major causes of non-cardiac chest pain and shortness of breath, and will describe the general steps in making a diagnosis and describe the general treatment options for these illnesses. The student will recognize that the diagnosis and treatment of surgical (non-medical) chest pain and/or shortness of breath is done while or after ruling out medical causes of such symptoms (acute myocardial infarction, pneumonia, etc.).

Objectives

By the end of the core surgical clerkship, the student will be able to:

1. Describe the causes, diagnosis, and treatment of spontaneous pneumothorax.
 - a. Discuss the risks of pneumothorax which could prove life-threatening.
 - b. Discuss the underlying pulmonary pathology you might expect to find.
 - c. Discuss the role of: observation, tube thoracostomy, chemical sclerosis, and surgical management of this condition.
 - d. Discuss the likelihood of recurrence and occurrence on the opposite side.
2. Describe the common etiologies for hemothorax. (see trauma module)
3. Describe the presentations, etiologies and management of pulmonary embolus (PE).
 - a. Discuss the predisposing factors which may lead to PE.
 - b. Discuss the electrocardiographic changes which might be seen and how they might be distinguished from those of myocardial infarct.
 - c. Discuss the main points in the diagnostic evaluation for PE.
 - d. Discuss management options in treating a PE and display understanding of the role and timing of all of the following management options:
 - 1) Anticoagulation with heparin
 - 2) Lytic therapy
 - 3) Vena caval filter protection
 - 4) Pulmonary embolectomy
 - 5) Open thoracotomy
4. Describe the presentation, etiology, and management of esophageal rupture.
 - a. Discuss the most common causes of rupture.
 - b. Discuss the sites within the esophagus most frequently perforated.
 - c. Discuss the risks of untreated perforation.
 - d. Discuss the indications for surgical management of esophageal perforation, identifying which patient is best managed non-operatively and who requires an urgent operation.
 - e. Discuss the treatment priorities in treating most esophageal perforations.
 - f. Discuss the relationship of underlying esophageal disease to treatment options in the management of perforation.
5. Describe the common presenting symptoms associated with gastro-esophageal reflux.
 - a. Discuss the relationship of reflux to chronic asthma and aspiration.
 - b. Discuss the appropriate diagnostic work-up of a patient with suspect reflux, and discuss the role of barium swallow, endoscopy, manometry, 24-hour pH testing.
 - c. Discuss the evaluation of dysphagia.
 - d. Discuss the treatment of esophageal stricture and the risks of dilation.

Non-Cardiac Chest Pain and Shortness of Breath (continued)

Objectives (continued)

- e. Discuss Barrett's esophagus and its implications.
 - 1) What are the risks of malignancy?
 - 2) Who needs surgical management and which procedure (antireflux or resection) is needed?
 - 3) Discuss surgical options for reflux (consider abdominal or thoracic, laparoscopic vs. open. partial vs. complete wrap).
- 6. Describe the clinical findings, symptoms, and etiology of empyema.
 - a. Discuss the clinical situations likely to be associated with formation of an empyema.
 - b. Discuss the usual organisms isolated in culture.
 - c. Discuss the management options for treating empyema and the differences in management of empyema in children.
 - d. Discuss the surgical options in the management of empyema.

Problems

- 1. A 52-year-old man presents with upper chest and back pain and dyspnea of 3 hours' duration.
 - a. What are the important points in the medical history (risk factors, family and previous history)?
 - b. What are the important parts of the physical exam that may help secure a diagnosis?
 - c. How will you differentiate cardiac ischemia from aortic root dissection?
 - d. Why might cardiac ultrasound be important?
- 2. A 26-year-old man presents to the ER with a two-day history of productive cough and about 3 hours of right-sided chest pain and shortness of breath.
 - a. What is the differential diagnosis?
 - b. What are the important issues in his past and family history?
 - c. What is the diagnostic evaluation for this condition?
 - 1) CXR shows a 30% collapse of right lung with small amount of fluid in the right costophrenic margin.
 - a) What is the initial management?
 - b) What do you do if after four days of chest tube suction, he still has an air leak from the lung?
 - c) What is the likely surgical treatment for failed conservative management?
- 3. A 47-year-old woman has chest pain after eating dinner at home 4 hours following upper GI endoscopy for dilatation of her achalasia.
 - a. What is the presumed diagnosis?
 - b. What is the best means of making the diagnosis?
 - c. What is the appropriate management?
 - 1) Under what circumstances might you manage this non-operatively?
 - d. What might be an appropriate management for a small perforation at the GE junction with minimal soiling?

Non-Cardiac Chest Pain and Shortness of Breath (continued)

Skills

1. Conduct a focused H&P to include chest and abdominal exams.
2. Describe how to perform a needle decompression of tension pneumothorax.
5. Establish and maintain an airway. www.facs.org/education/program/simulation-based
7. Describe how to perform a thoracentesis and interpret its findings.

Teaching Hints

1. Emphasize differential diagnosis based on age and risk factors.
2. Develop a teaching file of CXR, CT, lung scan, etc.
3. Review EKG changes of ischemia, PE, pericarditis.
4. Go over a normal tube thoracostomy drainage system with students to demonstrate how it works and how to distinguish a patient leak from a system leak.
5. Demonstrate proper chest tube care and removal.
6. Discuss interpretation of EKG, CXR, CT scans, barium swallow.
7. Review management of acute and chronic anticoagulation with heparin and Coumadin.
8. Emphasize recognition of altered breathing patterns.

Prevention

Discuss which patients are at significant risk for DVT and need prophylaxis.

Special Considerations

Discuss which patients are at significant risk for DVT and need prophylaxis.