Mediastinitis

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Case Presentation

69 year-old male from nursing home

PMHx: COPD, asthma, HTN, Afib on pradaxa, PTSD, BPH
c/o ‘pulled pork stuck in throat’
s/p EGD one week prior for UGIB
Physical Exam

125/74 98.3 75 30 100%

Mild distress, unable to manage saliva

Severe crepitus at base of neck

b/l breath sounds
Labs

**WBC** 17.9 **HGB** 12.5 **HCT** 38.5 **PLT** 215

**Na** 140 **Cl** 97 **BUN** 12 **Glu** 151

**K** 5.0 **CO2** 29 **Cr** 0.87

**Prot** 6.8 **Alb** 3.9 **Lactate** 4.6
EGD

Impacted food bolus at 20 cm

Mucosa erythematous, edematous, friable

No visible perforation

Normal stomach

still w/ dysphagia, unable to tolerate esophagram
Overnight...

Transferred to SICU, Unasyn

Hypotension, fever and respiratory distress in early AM, intubated

NG tube placed, esophagram in AM
Course

HD1 - remained intubated, WBC 20. TPN started.

HD3 - extubated, WBC 10

HD5 - clears

HD6 - regular diet

HD7 - discharged
Mediastinitis
Outline

Anatomy

Mediastinitis

Descending Necrotizing Mediastinitis

Mediastinitis from Esophageal Perforation

Poststernotomy Mediastinitis

Chronic Mediastinitis
Mediastinum

Thoracic outlet to diaphragm, between the lungs
Anterior

Thymus

Fat

Lymph nodes

Connective tissue
Middle
Heart
Great vessels
Vagus
Thoracic duct
Lymph nodes
Esophagus*
Posterior

Paravertebral sulci

Intercostal NVB

Thoracic spinal ganglion

Sympathetic trunk

More lymph nodes...
(Superior)

Sternomanubrial joint to 4th thoracic vertebra
Mediastinitis - Definition (CDC)

Diagnosis requires one of the following:

1. Organisms cultured from mediastinal tissue or fluid
2. Evidence of mediastinitis during operation
3. Fever, chest pain, or sternal instability with one of the following
   a. purulent drainage from mediastinal area
   b. organisms from discharge from mediastinal area
   c. mediastinal widening on CXR
Mediastinitis - Epidemiology

Most common cause = iatrogenic (90% of cases)

**Mortality** 5-40%!

Post-op from sternotomy = 0.5-1%

www.downstatesurgery.org
Mediastinitis - Etiology

Four possible sources:

1. Direct contamination (sternotomy, esophageal perforation, trauma)
2. Hematogenous / lymphatic spread
3. Extension from above (neck) or below (retroperitoneum)
4. Extension from lung, pleura, or chest wall
Acute Mediastinitis

Esophageal perforation (posterior)

Cardiac surgery (anterior, discussed separately later)

Penetrating trauma

Oropharyngeal abscess

Neck surgery

- thyroidectomy, tracheostomy, lymph node biopsy!
Descending Necrotizing Mediastinitis

Four criteria:

1. Oropharyngeal infection
2. Mediastinitis on imaging
3. Evidence during operation
4. Relationship between oropharyngeal and mediastinal processes
Microbiology

Anaerobes, gram-negative aerobes

- most common are Strep, Bacteroides

*Most infections are polymicrobial*

Debilitated pts - candida and aspergillus
Clinical Features

ACUTE onset

fever, leukocytosis, chest pain

Neck → dysphagia, odynophagia

Esophagus → dysphagia

Pleura → respiratory distress
Imaging

- **CXR**
  - Mediastinal widening
  - gas, air/fluid level
  - Pneumomediastinum/Pneumothorax

- **Esophagram**
  - Gastrografin (10-25% false negative) vs. Barium (inflammation)

- **CT scan**
  - 1st Choice!
Treatment Principles

Expedient diagnosis and treatment

IVF & broad-spectrum Abx

Surgical drainage - varies by etiology

Multidisciplinary approach

Frequent reimaging and redebridement
Treatment - Descending Necrotizing Mediastinitis

- Remember cervical fascial planes
- Aggressive cervical debridement
- Upper mediastinum accessible
  - blunt dissection of pretracheal space
  - dissection of retropharyngeal space
● Thorax, 1997
● Infection extending below carina -> thoracic approach
● meta-analysis of 12 series
● Compared mortality between neck drainage alone (47%) vs. neck and thoracic drainage (19%)
Other approaches...

- Posterolateral thoracotomy
- Median sternotomy
- Clamshell
- Subxiphoid
- VATS
● Journal of Thoracic and Cardiovascular Surgery, 2000
● Retrospective review, 10 cases
● Algorithm for DNM w/ serial debridement and reimaging q48 hours
Treatment - Esophageal Perforation

- Nutrition, abx, NGT, PPI, pleural drainage
- Early surgery w/ repair of perforation
  - Muscle/omental/pericardial/pleural flap
  - Covered stents

Complications - migration, ischemia, bleeding, retrieval
Poststernotomy Mediastinitis

Risk Factors:

- Obesity, DM, COPD, PVD, s/p CABG w/ b/l IMA

Incidence remains constant despite advances (0.5 -1.0%) 

Mortality 16-47%
Poststernotomy - Microbiology

Broad spectrum

- Gram +/- and fungal
- Most common S. Aureus
  - others: Aerobic Strep, coag- Staph, Pseudomonas, Enterococcus
- Dx w/ sternal puncture
BONE MARROW ASPIRATION and TRANSFUSION continued

Jones Sternal Puncture Needle

- Cat. No. 7661, 10G x 1.5"
- Has a large knurled luer lock hub and looped wire clamp, 30° point with fitted stylet.

Morrison Bone Biopsy Needle

- Cat. No. 7875, 18G x 1 1/2"
- Has a female luer lock hub attached to a gripping shield. Cannula has a medium bevel with unique feature of the right side of the bevel being slightly lower than the left. Fitted stylet has machined beveled point.
Poststernotomy - Treatment

Sternal dehiscence - closed irrigation/VAC

Deep sternal wound infection - flap reconstruction

- Pec major, rectus, free lat dorsi, omentum
Chronic Mediastinitis

Secondary to acute mediastinitis or granulomatous process

- Histoplasmosis, syphilis, tuberculosis, coccidiomycosis, sarcoidosis, foreign bodies
- Usually asymptomatic unless compression
- Surgery only for biopsy and palliation
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Multidisciplinary approach

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