Foregut Duplication Cysts

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Grand Rounds
Case Presentation

- 25 yo female presents with 3 year history of progressive dysphasia and weight loss
- PMH/PSH: rheumatoid arthritis
- NKDA
- Medications: methotrexate
Case Presentation

Vital Signs:
T 97.5 BP 128/67 HR 76 RR 16
O2 sat 98%

General: thin, appearing female
CV: RRR, S1S2 normal
Pulm: CTA bilaterally
Abdom: soft nontender, nondistended
Extr: no edema or tenderness

Upreg: negative
Image manually calibrated.
Pat pos: FFS

Exam: PE SERIES CTA (CHEST ONLY)
Series: PE CHEST TIBT/Thorax
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Operative Summary

- Bronchoscopy, esophagoscopy, Right thoracotomy, resection of posterior mediastinal mass
Pathology

- Esophageal Duplication Cyst
**Postoperative Course**

- Patient tolerated clear liquids on POD#1.
- Chest tubes were removed on POD#2 and 3.
- Discharged on POD #5
Discussion

- History of foregut cysts
- Different types of foregut cysts
- Surgical Technique
- Questions
History of foregut cysts

- 1674- Charles James Blasius
  - Esophageal duplication cyst
- 1881- Roth
- 1884- Fitz - (“duplication”)
  - Omphalomesenteric duct remnants within abdomen
Foregut cysts histology

- Remnants from primitive foregut
  - respiratory tract or alimentary tract components
- May contain organized histologic architecture
  - Heterotopic lung tissue, ganglia, gastric
- Ileum (50%), esophagus (23%), colon (15%), stomach (5%), duodenum (4%), pancreas (1%)
Esophageal Duplication Cysts

- “Dorsal enteric cysts”, “gastroenteric cysts”, “gastrocytomas”, “enterogenous cysts”
- Middle and lower 1/3 of esophagus
- Congenital
- 2Men : 1Females ( 75% < 16 yo)
- Blood supply derived from esophagus
Criteria to characterize esophageal cyst

- Palmer criteria:
  - 1-Attachment to the esophagus
  - 2-Epithelium characteristic of some level of gastrointestinal tract
  - 3-Presence of 2 layers of muscularis propria
Presentation

- Identified on routine antenatal ultrasound
- Asymptomatic throughout childhood
  - **Airway compression**
    - Perihilar region and younger
  - **Dysphagia, substernal pain**
  - Ectopic gastric mucosa in cyst
    - Pain, bleeding and perforation
- Fistula formation
Associations...

- Contiguous or distal alimentary tract 2nd cyst
- Associated with congenital anomalies
  - VACTERL
  - Skeletal anomalies
    - Spina bifida, hemivertebrae, vertebral fusion
  - Genitourinary duplications, intestinal malrotation, hindgut anomalies, atresia
How they come about

- Persistent vacuoles in the wall of the foregut
- Simple columnar, pseudostratified ciliated columnar or stratified squamous epithelium
- Within or in close proximity to esophageal wall
- Overtime- fill with mucus and size increases

Obstruction
Presentation

- Identified on routine antenatal ultrasound
- Asymptomatic throughout childhood
  - Airway compression
    - Perihilar region and younger
  - Dysphagia, substernal pain
- Ectopic gastric mucosa in cyst
  - Pain, bleeding and perforation
- Fistula formation
Diagnosis

- CXR
- Barium esophagram
  - Smooth oval mass obstructing lumen
- CT scan
  - Smooth, well defined cystic lesion devoid of calcifications
- EUS

**Townsend: Sabiston Textbook of Surgery, 19th ed.**
Treatment

- If untreated → obstruction, infection, rupture
- Aspiration → inadequate
- Surgical Resection
  - Extramucosal resection or enucleation

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Surgical Management

Indications:

- Symptomatic
- Malignancy cannot be ruled out
Surgical Approach

- Thoracotomy
- Thoracoscopic resection
  - Large cysts initially drained
  - Trocar sites directed toward post mediastinum
  - 3 ports - 1- 5 mm camera port, 2- 5mm
Thoracoscopic Resection of Esophageal Duplication Cyst
Bronchogenic cysts

- Most are primary cysts of mediastinum
- Common in pediatric population
  - Men > females
Histology
How do they develop?

- Abnormal budding or branching of tracheobranchial tree
- Location depends on developmental stage
  - Paratracheal-usually to the right
  - Adhered to esophageal wall
  - Most common- right hilar and subcarinal
Clinical Presentation

- Not associated with other congenital anomalies

- Symptoms:
  - Obstructive - neonate
  - Infectious/inflammatory - older child
  - Dysphagia

- Congenital lobar emphysema
Diagnosis

- **CXR**
  - Mediastinal opacification if cyst autonomous
  - Radiolucent if communicates with airway

- **CT scan**
  - Air fluid levels in mediastinum
  - Size, location and anatomic relationship

- Bronchoscopy
Bronchogenic cysts
Bronchiogenic cyst in middle mediastinum
Management and Surgical Considerations

- Assessment of airway
  - Need a secure airway if in respiratory distress
- Clear infection prior to surgical resection
  - Minimize adhesions and postoperative infectious complications
Operative Approach
Gastric Duplication Cysts

- 2 male: 1 female
- 3 morphologic criteria:
  - 1-attached to stomach, contiguous with wall
  - 2-at least one layer muscle
  - 3-normal gastric mucosa
- 2-7% of all GI duplications
Diagnosis and Treatment of gastric duplication cysts

- **Diagnosis**
  - CT scan, MRI

- **Treatment**
  - Surgical cystectomy or partial gastrectomy
Excision of Esophageal Duplication Cysts with Robotic-Assisted thoracoscopic Surgery

- **Case 1:**
  - 12 yo female
  - 2 cm x 1.5 cm mass in posterolateral mid thoracic esophagus on right

Excision of Esophageal Duplication Cysts with Robotic-Assisted thoracoscopic Surgery

- **Technique:**
  - Left lateral decubitus
  - Double lumen tube
  - 8mm port at 6th intercostal space-midaxilla
  - 3- 8 mm ports inserted
    - Upper chest behind scapula
    - 2 x right lower chest

DaVinci resection of esophageal cyst

In Summary

- Esophageal duplication cysts can present with dysphagia and respiratory symptoms
- Differentiated by histology
- Operative intervention if patient is symptomatic or malignancy cannot be ruled out
- VATS and robotics
Question 1

- The criteria for esophageal duplication cyst include all of the following except:
  - A- attached to the esophageal wall
  - B- has 2 muscularis layers
  - C- includes cartilage in the wall
  - D- has squamous epithelium
Question 2

33 year old female presents with 2 month history of dysphagia and a 2 week history of substernal chest pain. She is hemodynamically normal. She undergoes a barium swallow which is shown below. The next step in management would be:

- A- CT scan of the chest
- B- Take to operating room immediately
- C- Manometry
- D- Observation and repeat barium study in 6 months
References

- **Townsend**: Sabiston Textbook of Surgery, 19th. - 2012 - Saunders, An Imprint of Elsevier
- **Holcomb & Murphy**: Ashcraft's Pediatric Surgery, 5th ed. - 2010 - Saunders, An Imprint of Elsevier