Management of Chylothorax

Sybile Val, MD

December 5, 2008
## Case Presentation

### History

**HPI:**
- 13 YOM with Waldmann’s disease admitted for increasing LE swelling for past 2 months

**PMH:**
- Asthma
- Primary Intestinal lymphangiectasia
- Protein losing enteropathy

**PSH:**
- LIHR
- Mediport (albumin)
- Chest tube/PT drainage x 3

**Meds:**
- Aldactone
- Aquadek
- Lasix
- Xopenex
- Calcium

[View more at www.downstatesurgery.org](www.downstatesurgery.org)
Physical Exam:
- AAO x 3 in NAD, 53kg
- Decreased BS right > left
- Abdominal ascities
- Pitting edema from b/l LE, genitalia and lower abdomen

Labs:
- CBC: 4/10/29/382
- Chem: 144/4.7/113/24/27/0.4/96
- LFTs: 3.7/2.9/15/6/74/0.3
Case Presentation

Hospital Course

• HD# 2:
  – Right sided pigtail placed by VIR
  – Started on TPN
  – Pleural fluid Analysis
    • Glucose -- 96
    • Protein -- <2
    • Triglyceride -- 291
    • LDH -- 76
    • WBC -- 161
Case Presentation

Radiologic Imaging
Case Presentation

Radiologic Imaging
Hospital Course

• HD#3-7
  – Pleural drainage monitored
  – Treatment with albumin, lasix and electrolyte supplementation initiated

• HD#7
  – Cardiothoracic surgery consultation obtained
Sybile did you hear me?

Sorry Ricci...I think

CHEESE!!!
Operation: Thoracic duct ligation
Operation: Thoracic duct ligation
Case Presentation

Operation: Thoracic duct ligation
Lymphatic vessel wall showing edema, chronic inflammation, marked congestion with recent and old hemorrhage and focal fibrosis
Immediately Post-Op
Post Operatively

• POD #1:
  – Pain controlled, tolerated diet
  – Decreased drainage

• POD#4/6:
  – Chest tubes removed

• POD#7:
  – Discharged home
Then what?
• POD#9
  – Found to have fever of 101 in clinic
  – Admitted, urine culture +ve for E. coli
  – Dx: Urosepsis, discharged 2 days later
  – CXR: Negative

• POD#39
  – Routinely scheduled echo → large effusion
  – Underwent pericardial window (POD#48)
  – Doing well…
Yesterday...

- Admitted for regularly scheduled albumin infusion... last albumin level 2.2
- Reports decrease in LE swelling
- Increased exercise tolerance
- Overall... happy
Questions??
Chylothorax
Thoracic duct

- Ascends from cisterna chyli
- Enters thorax via aortic hiatus
- Lies between aorta and azygous until T5
- Crosses over to left behind aortic arch
Thoracic duct

- Arches over subclavian artery in anteriolateral superior mediastinum
- Empties into the venous circulation at junction of left jugular and subclavian veins
Chylothorax

**Traumatic**
- Blunt
- Penetrating
- Diagnostic/VIR procedures
- Post-Operative

**Non-Traumatic**
- Congenital
- Neoplasms
- Infectious
- Venous thrombosis
- Autoimmune Disease
- Radiation exposure
Waldmann’s Disease

- Rare disorder
- Dilated intestinal lacteals
- Protein losing enteropathy
  - Lymphopenia
  - Hypoalbuminemia
  - Hypogammaglobulinemia
Waldmann's Disease

- **Symptoms:**
  - B/L LE edema
  - Anasarca
  - Pleural effusion
  - Pericarditis
  - Chylous ascites

- **Diagnose with endoscopy**

- **Confirmatory test:**
  - 24 hour elevated alpha-antitrypsin
Clinical Presentation

- Symptoms induced by mechanical effects
  - Gradual decrease in exercise tolerance
  - Dyspnea
  - Fatigue
  - Metabolic/Immunologic deficiencies

Fever and chest pain rarely occurs!
Clinical Presentation

- Pleural Fluid Analysis
  - Initial diagnostic test
  - Sample evaluated for:
    - Cell count
    - pH
    - Triglycerides
    - Cholesterol
    - Glucose
    - Lactic dehydrogenase
    - Total protein
    - Cytology/culture
Work Up

Unknown etiology

- CT scan thorax/abdomen
- Lymphangiography/
  Lymphoscintigraphy

Known etiology

- Lymphangiography/
  Lymphoscintigraphy

www.downstatesurgery.org
Lymphangiography

- Main imaging modality
- Allows precise definition and location of chylous leak
- Identifies anatomic aberrations
- Allows for selective duct ligation

Porziella et al, Lymphangiography in recurrent spontaneous chyothorax, Eur J CT. 2007;32:536
Treatment Options

• Conservative
  – Chest tube drainage
  – Low fat, medium chain TGs
  – Complete bowel rest and TPN

Other considerations?

– Octreotide
  • Decreases GI secretions and lymphatic flow by increasing resistance to splanchnic blood flow

Treatment Options

• Pleurodesis
  – Bleomycin
  – Talc
  – Tetracycline
  – *Sapylin
    • Biological preparation of streptococcus
    • Activates NKT cells
    • Induces production of TNF, IL-6, VEGF, TGF-beta

Well Sybile, when do we operate!?
Surgical Indications

- Failure of conservative management
- Recurrence after conservative mgmt
  - Timing of surgery debatable
  - Usually between 1 – 3 weeks
    - Earlier intervention with large volumes of drainage (>1Liter/day)
  - Drainage >200 – 500ml/day
Surgical Options

Mechanical Pleurodesis
Pleurectomy
Right SD Thoracic duct ligation
Pleuro-peritoneal shunting
Christodoulou et al, Video–assisted right supradiaphragmatic thoracic duct ligation for non-traumatic recurrent chylothorax. EJCTS 2006;29:810-814
Right VATS, TDL

- Six patients with recurrent/persistent chylothorax
- Mean operative time – 102 min
- No complications
- Mean time of CT drainage 7 days
- 90 day post-op morbidity – zero
- No recurrence after 41 month f/u (5/6)

Christodoulou et al, Video–assisted right supradiaphragmatic thoracic duct ligation for non-traumatic recurrent chylothorax. EJCTS 2006;29:810-814
Doc, is there a less invasive option?
Treatment

• Percutaneous catheterization
  – First described by Cope and colleagues in 1999
  – Hoffer and colleagues described a modified technique in 2001
    • 11 patients
      – 5 underwent embolization
      – 45% success rate
      – No morbidity
Summary

- Chylothorax rare but clinically devastating entity with mortality rate as high as 50%
- Diagnosis made with presence of >110 TG
- Conservative management is initial treatment
- Surgical intervention after 1-3 weeks or drainage >500-1000/day
- Perc intervention…wave of the future
Questions...
A 62 YOF presents to the ER for evaluation of a productive cough. She states that her coughing began 6 weeks ago and she has been worsening; it is now associated with bloody sputum. She feels well otherwise and denies having any recent fever or illness. Her medical history is significant for a 40 pack-year history of smoking. The patient’s vital signs are normal. PE reveals course rhonchi throughout.

Which of the following radiographic studies is most recommended for the evaluation of the patient’s hemoptysis?

a. MRI
b. Chest CT with contrast
c. Routine CXR
d. Ultrasound

Answer: B
2. A 65 YOF in the ICU is experiencing the acute onset of bleeding at her tracheal stoma site. Her tracheostomy tube has been in place for over 6 weeks. The bleeding worsens throughout the day. Bronchoscopy reveals a tracheoinnominate fistula.

Which of the following treatments is most recommended for this patient's condition?

a. Stabilization with rigid bronchoscopy followed by fistula resection
b. Placement of a tracheobronchial stent
c. Bronchial biopsy to confirm diagnosis
d. None of the above

Answer: A
3. A 35 year old airline pilot has acute shortness of breath and on physical examination he is found to have decreased breath sounds on the right side. CXR reveals a pneumothorax and a chest tube is placed.

The most appropriate management is

a. Serial CXR
b. Chemical pleurodesis
c. Axillary thoracotomy
d. VATS
e. Posterior lateral thoracotomy

Answer: D
4. A 43 year old woman presents with a 2 day history of fever, shortness of breath and cough production of yellow sputum. On examination she has decreased breath sounds at base of left lung. CXR reveals opacification of the left diaphragm with a large pleural effusion. CT scan shows a well circumscribed pleural collection without loculation. Diagnostic thoracentesis yields frank pus with gram negative bacteria on gram stain.

Appropriate management would include IV antibiotics and
a. Needle drainage
b. Ultrasound guided pigtail
c. Bedside thoracostomy
d. VATS decortication
e. Open decortication

Answer: C
This Week’s’ ACS Questions

5. Which of the following about lung cancer is true

a. Most common type of noncutaneous cancer in men and women
b. Most common cause of cancer death in men and women
c. Death reduced by 25% in smokers undergoing annual screening with CXR
d. Metastatic disease to regional or distant sites already present in one fourth of patients
e. Overall 5 year survival rate 25%

Answer: B
The End

www.downstatesurgery.org