



University of Pittsburgh

# *Intra-Operative Heavy Cream Administration for Thoracic Duct Ligation*

Mimi Lyons

University of Pittsburgh

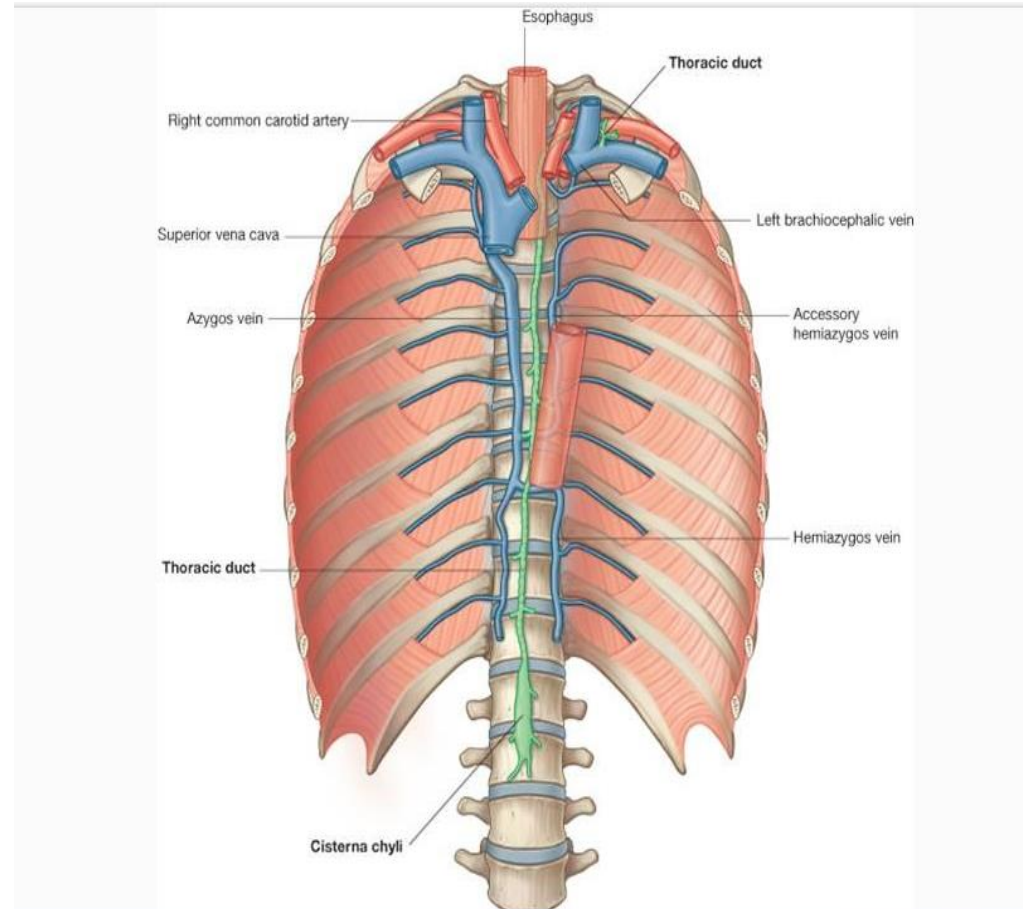
School of Nurse Anesthesia

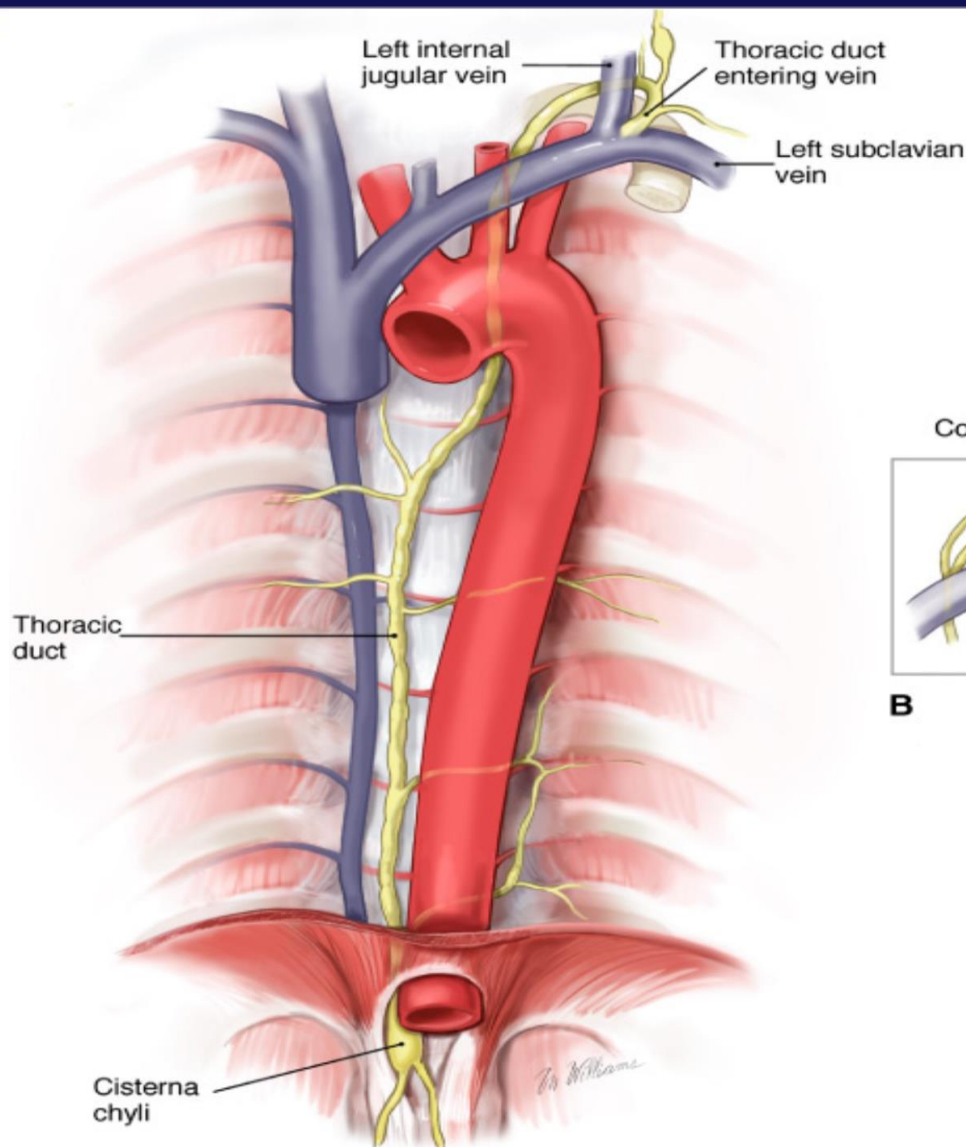




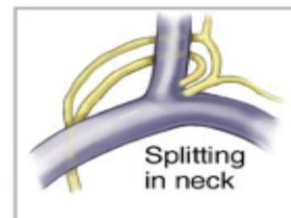
# Thoracic Duct

The main function of the duct is to transport fat absorbed from the digestive system. It carries 60-70% of ingested fat from the intestine to the circulatory system. The composition of normal chyle is fat, with variable amounts of protein and lymphatic material.

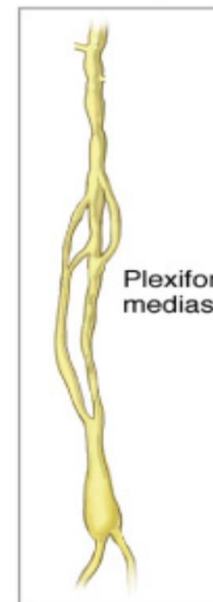




Common sites of variant anatomy:



**B**



**C**

**A**



# Pathophysiology of Thoracic Duct Leak

- Chylothorax is the collection of an excessive amount of chyle in the pleural space.
- Develops most commonly after surgical trauma to the thoracic duct or a major branch.
- A milky pleural effusion accumulating at a rate of greater than 400 to 700 mL per day is suggestive of chylothorax.
  - Leaks in excess of 2 L/day



# Clinical Features



**Hypovolemia** and **respiratory insufficiency** from rapid chyle loss

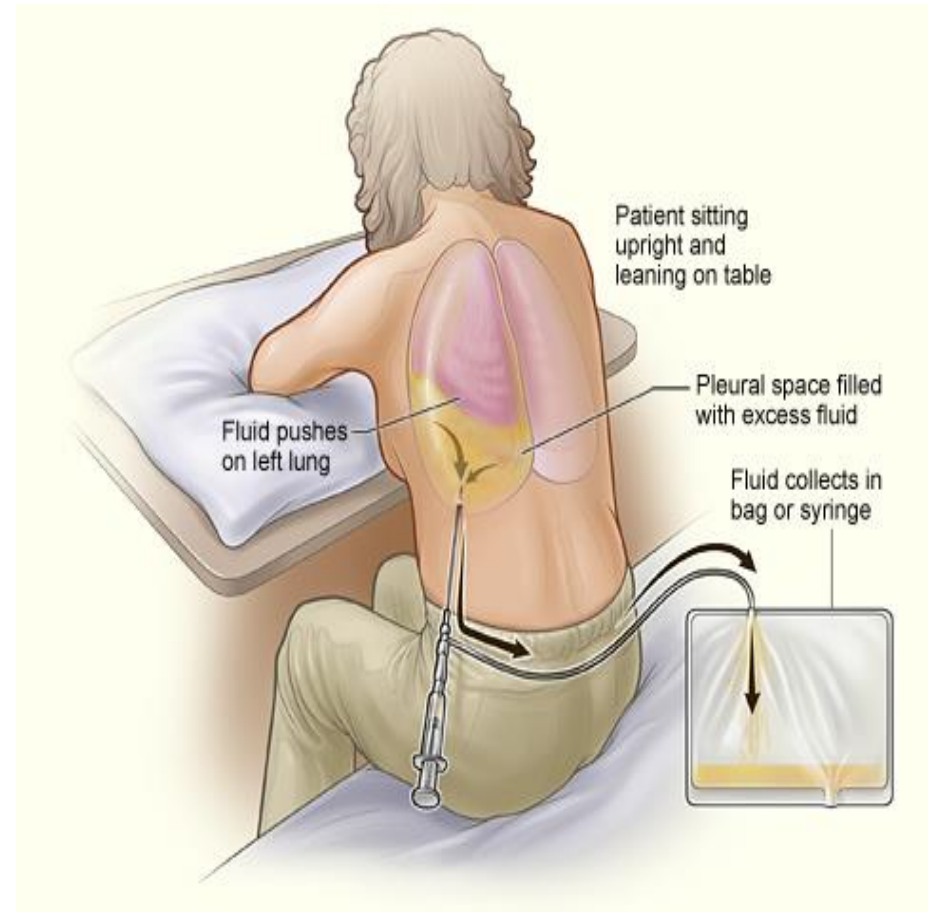
**Malnutrition** due to loss of protein, fats and vitamins

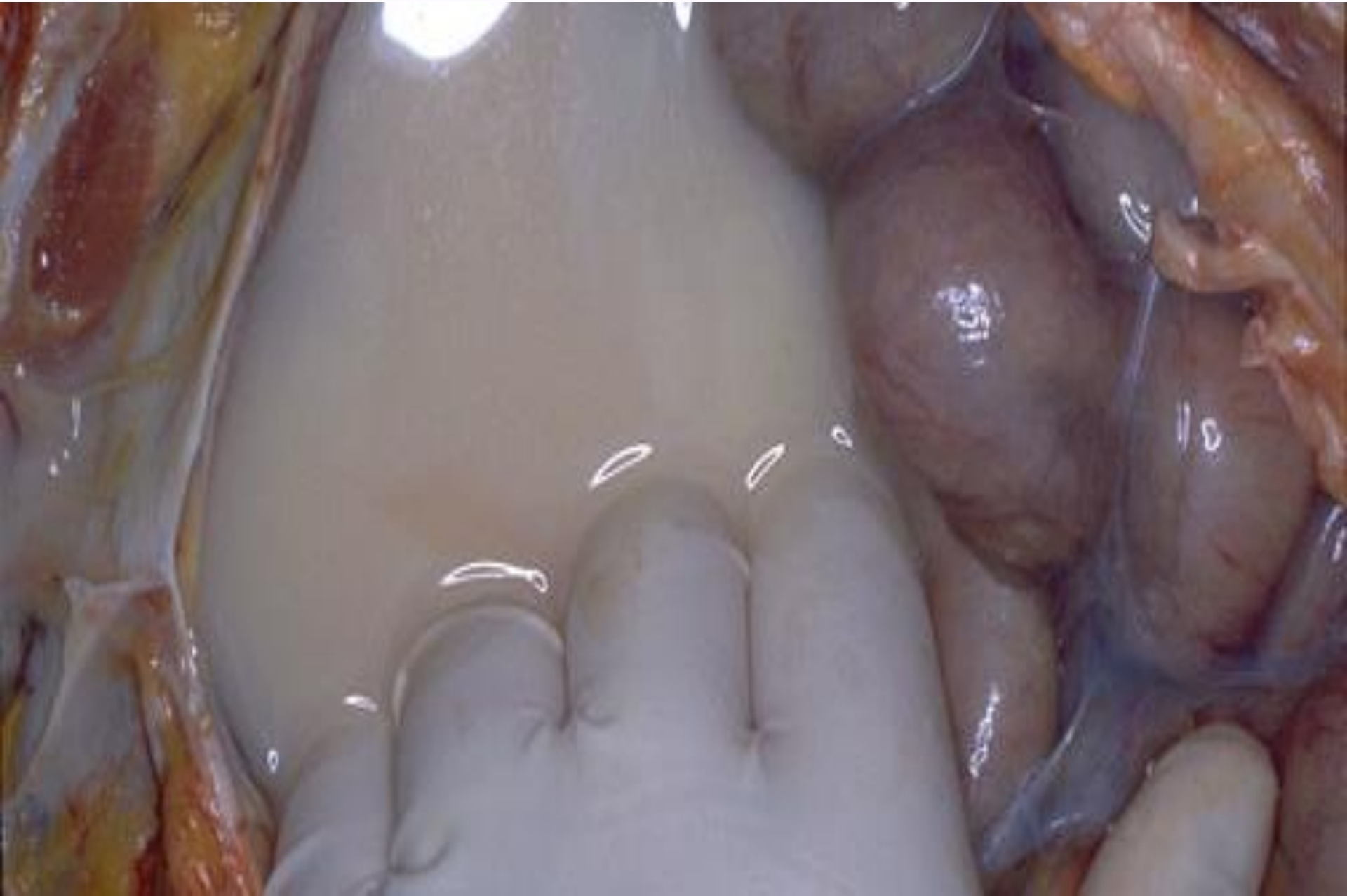
**Electrolyte loss** can result in hyponatremia and hypocalcemia

**Immunosuppression** can result from loss of immunoglobulins, T-lymphocytes and proteins.

# Diagnosis

- Thoracentesis
  - Often the pleural fluid is milky and nonpurulent
  - Laboratory analysis of the pleural fluid shows a high lymphocyte count and high triglyceride levels.
    - Triglyceride level is  $>110$  mg/100 mL (99% accuracy rate)







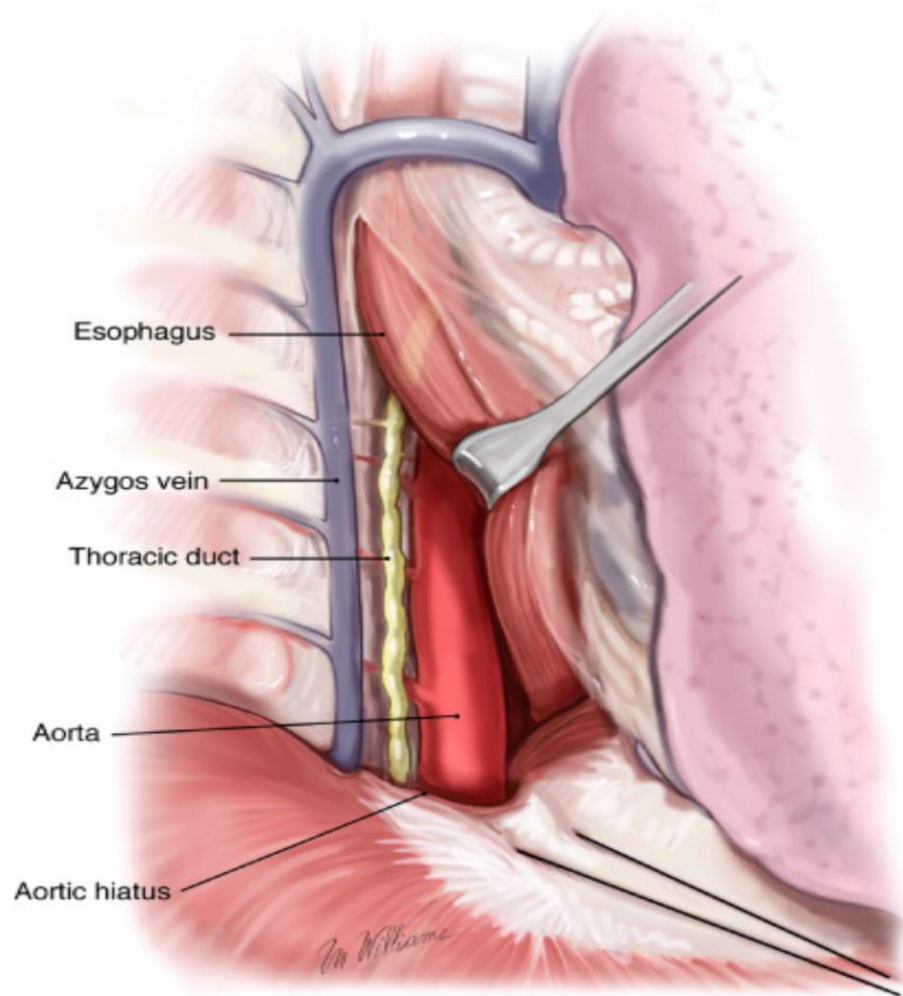
# Morbidity and Mortality

- If this leakage is left untreated, protein, volume, and lymphocyte depletion can lead to serious metabolic effects and death.
- The continued loss of chyle leads to significant depletion of fats (up to 70% of dietary intake), proteins, and T lymphocytes. marked disturbances in the immunologic and nutritional profile occur in these patients.





# Procedure





# Methods to Aid in Identification of Thoracic Duct

- The administration of a high-fat meal 3 hours before surgery, with or without dye, or the subcutaneous injection of dye 1 hour before surgical exploration.
- Before incision, up to 1 L or more of heavy cream is administered enterally.





## Patient History

71-year-old woman with a history of non-small cell lung cancer involving the right lower lobe. She underwent a thoracoscopic right lower lobectomy. She has developed a refractory chylothorax which has been low output in nature.



# Anesthetic Concerns

**Airway Protection**

**+**

**Risk of Aspiration**



# Anesthetic Plan

## Standard Induction

### Airway:

- Easy intubation with 37fr left DL ETT confirmed with FO bronchoscopy.

### 18fr OG tube

- Placement confirmed with aspiration of gastric contents and fiberoptic bronchoscopy.

### Position:

- Left lateral decubitus position

### IV access:

- Left radial arterial line, right AC 20g IV, left EJ 16G IV



# Heavy Cream Administration

## 0802:

- 300cc per surgeon request

## 0855:

- 250cc per surgeon request
- Cream noted in patients mouth, surgeon and anesthesiologist aware

## 0927:

- 300cc requested, 150cc given
- Stopped d/t cream oozing out of patients mouth





## Extubation and Recovery

Unable to aspirate from OG, OG removed.

Extubated fully awake and sitting up at 30 degrees in OR.

Only postoperative complication was PONV

Discharged home six days post-op





# References

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