EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

BROWARD HEALTH
Care Warriors

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Pleural effusion

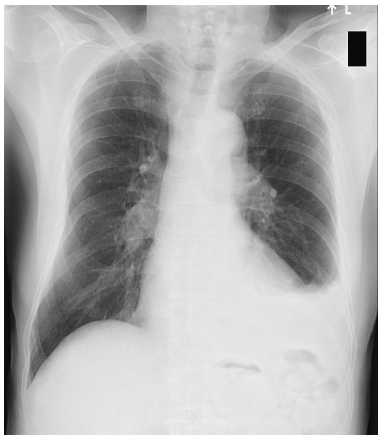
A 78 year old female, with past medical history of HTN, and DM type 2, presents to the ED complaining of left subcostal pain for 2-3 days, associated with dyspnea. She describes the pain as sharp, 5/10, and non-radiating. She notes cough symptoms a week prior while she was on a cruise ship. Otherwise the patient denies any calf pain, leg swelling, recent air travel, trauma, dizziness, chills, back pain, nausea, vomiting, body aches. Patient was febrile in the ED with a temperature of 101, but otherwise the rest of her vital signs were normal. Exam was benign other than tenderness of her left subcostal area and diminished breath sounds on the left lower lung fields. A CBC revealed a WBC of 15000 and a chest x-ray showed a left sided pleural effusion as well as left lower lobe consolidation. What is the appropriate initial treatment?

A. Thoracentesis

B. Empiric antibiotics

C. Indwelling pleural catheter

D. Chemical pleurodesis with talc



https://emedicine.medscape.com/article/299959-overview

Pleural effusions will typically cause blunting of the costophrenic angle, depending on how much fluid is present.

Small effusions may sometimes cause no blunting and appear normal on chest x-ray, requiring a CT chest to visualize.

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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The correct answer is B. Empiric antibiotics should be started immediately due to the increased morbidity an mortality associated with acute pneumonia and infected pleural effusions.

The typical symptoms seen in pleural effusions are dyspnea and pleuritic chest pain that is unilateral and sharp. Although dyspnea is usually the cardinal symptom, some patients may present asymptomatic as well. Physical exam findings include dullness to percussion over the area of the effusion, diminished breath sounds, and absent tactile fremitus.

Discussion

A pleural effusion is defined as an accumulation of fluid in the pleural cavity. Normally, pleural fluid is produced at the capillary bed of the parietal pleura and absorbed by the lymphatics of parietal and visceral pleura. However, in a pleural effusion there is a pathological accumulation of pleural fluid that has been caused by either an inflammation (pleuritis) or other diseases. [2]

Pleural effusions can be divided into two categories, transudative or exudative. The former is usually due to changes in hydrostatic and osmotic forces, while the latter is caused by an alteration in vascular permeability. Some causes of transudative effusions include CHF, nephrotic syndrome, atelectasis, and superior vena cava syndrome. Exudative effusions tend to be seen in inflammatory states, infection, or malignancies [4]. Lights criteria is used to determine whether pleural fluid is transudative or exudative. The pleural fluid to serum ratio of protein and LDH is used in Lights criteria to determine if an effusion is transudative or exudative.

A parapneumonic effusion refers to the accumulation of fluid in the pleural space in the setting of an adjacent pneumonia. An uncomplicated parapneumonic effusion is an effusion that is sterile, while a complicated parapneumonic effusion has been infected with bacteria or other micro-organisms. [1]

Treatment

Patients with uncomplicated parapneumonic effusions (typically small or moderate sized, free-flowing effusion), do not generally require drainage and are treated with antibiotics alone.

Antibiotic selection varies based on the site of acquisition (community versus hospital-acquired), severity of illness, and patient risk factors for drug-resistant pathogens. In general, empiric regimens should include antibiotics that target anaerobes and other likely pathogens (streptococci if community-acquired; methicillin-resistant *Staphylococcus aureus* [MRSA] and *Pseudomonas* if hospital-acquired) when a complicated parapneumonic effusion is suspected. Although nearly all antibiotics penetrate the pleural space, Aminoglycosides are the exception, and should therefore be avoided [3] .

For hospital-acquired infections (healthcare-associated pneumonia or post procedural empyema) vancomycin with metronidazole and an antipseudomonal cephalosporin (cefepime, ceftazidime) or combining vancomycin with a beta-lactam/beta-lactamase inhibitor (piperacillin-tazobactam, ticarcillin-clavulanate) is suggested. For those with a penicillin allergy who can't tolerate cephalosporins, vancomycin with metronidazole and an antipseudomonal quinolone (ciprofloxacin) is a good alternative. [1]

For infections community acquired infections, a third-generation cephalosporin (ceftriaxone or cefotaxime) plus metronidazole or single agent therapy with a beta-lactam/beta-lactamase inhibitor combination (ampicillin-sulbactam) is recommended. For those who are penicillin allergic and cannot tolerate cephalosporins, alternatives include a single agent therapy with a Carbapenam (imipenem or meropenem) or Metronidazole combined with either a Fluoroquinolone or a Monobactam (aztreonam). [1]

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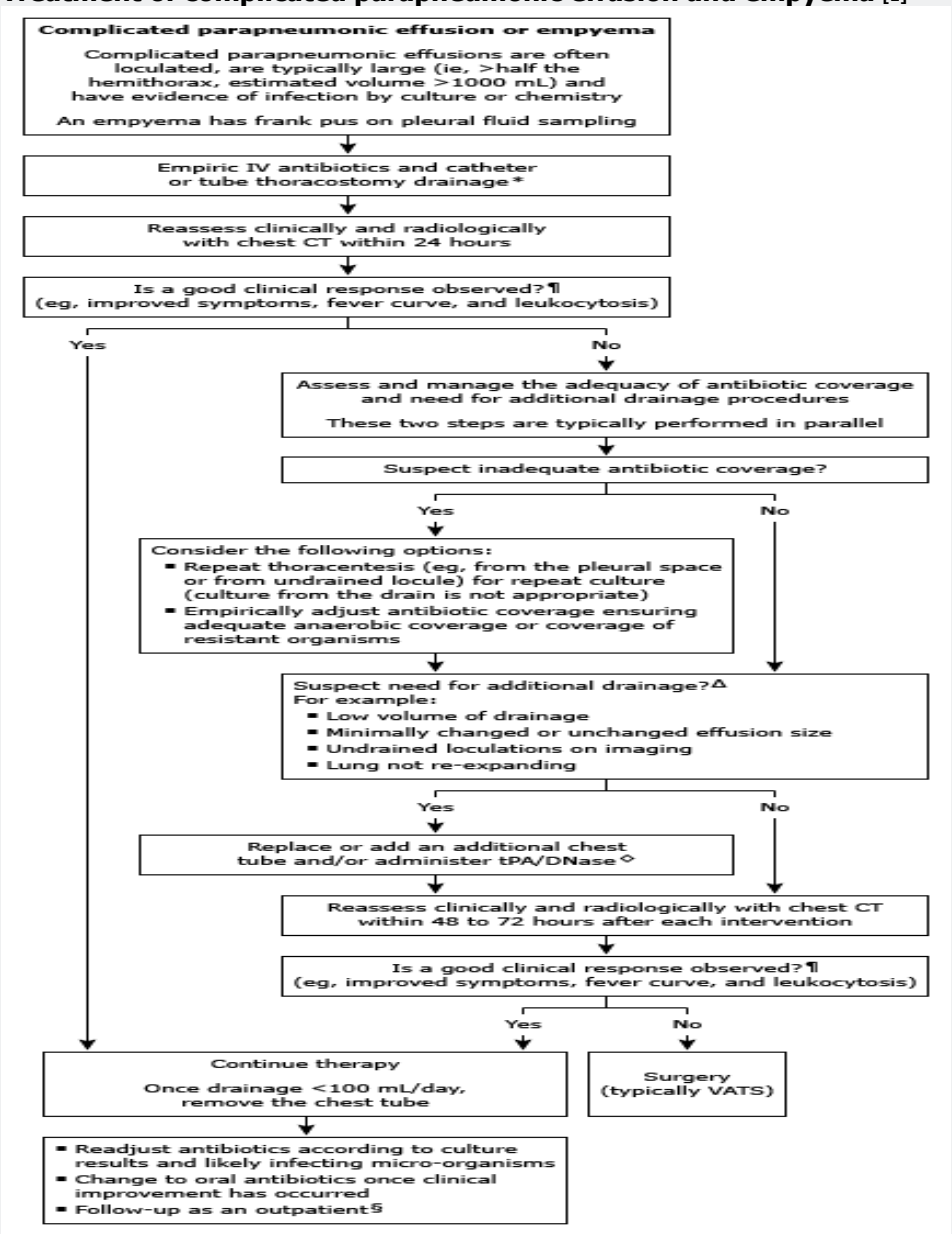
Treatment of complicated parapneumonic effusion and empyema [1]



Take Home Points

- Pleural effusions are classified as either transudative or exudative using Lights Criteria
- CHF is the most common cause of a transudative effusion while a Parapneumonic effusion is the most common type of exudative pleural effusions.
- Treatment of a noncomplicated parapneumonic effusion is with antibiotics only (empiric treatment)
- Complicated parapneumonic effusions require both antibiotics and drainage

ABOUT THE AUTHOR

This month's case was written by Sergio Tierrablanca. Sergio is a 4th year medical student from NSU-COM. He did his emergency medicine rotation at BHMC in February 2020. Sergio plans on pursuing a career in Family Medicine after graduation.

REFERENCES

1 UptoDate: Management and prognosis of parapneumonic pleural effusion and empyema in adults
2 A. Tremblay, C. Mason, G. Michaud: Use of tunneled catheters for malignant pleural effusions in patients fit for pleurodesis. In: The European Respiratory Journal, 2007
3 Vaudaux P, Waldvogel FA. Gentamicin inactivation in purulent exudates: role of cell lysis. J Infect Dis 1980; 142:586.
4 Goldman, L., Schafer, A. I., & Cecil, R. L. F. (2020). *Goldman-Cecil medicine*. Philadelphia, PA: Elsevier.