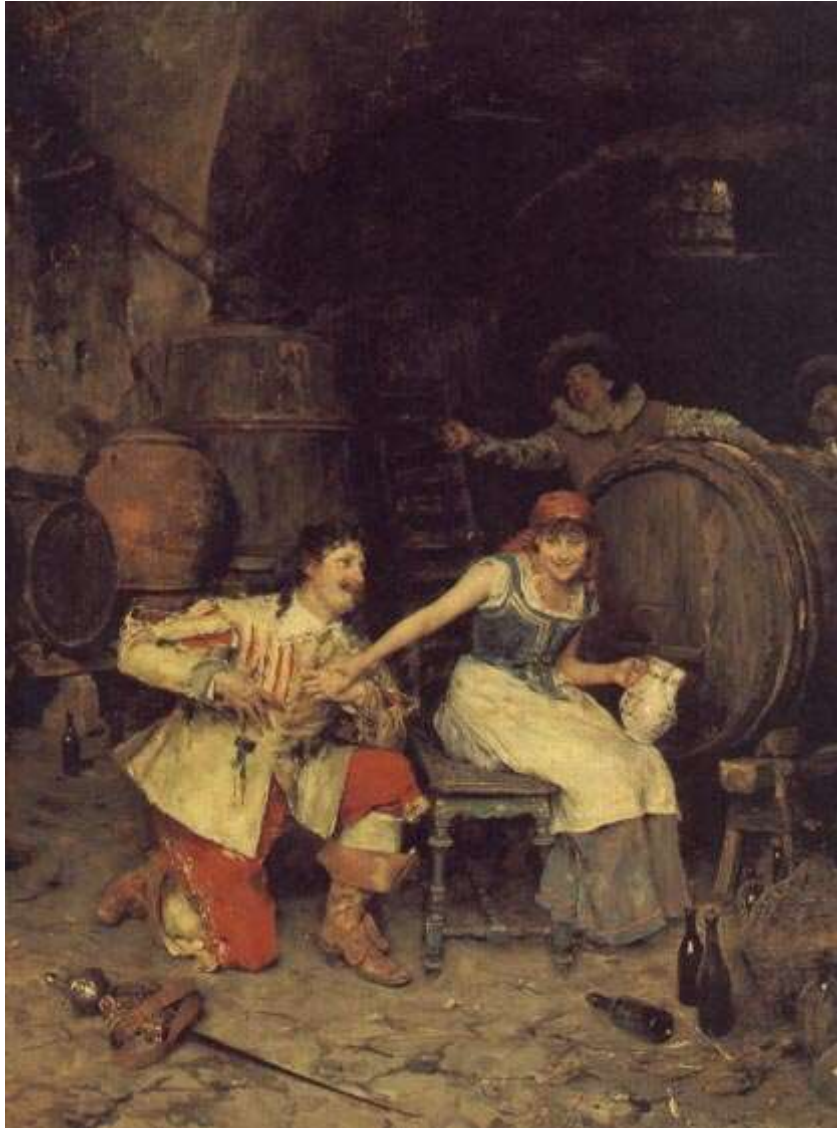


PLEURAL EFFUSION



“Flirtation in the Wine Cellar”, oil on canvas, Federico Andreotti, 1867

The Austrian Physician Josef Leopold Auenbrugger (1722-1809) is credited with the “discovery” of percussion as a diagnostic aid in the detection of chest disease. As a boy he had tapped the wine barrels in his father’s cellar to find how full they were. In 1754, he applied this method of percussion to the chest wall as an aid to the diagnosis of various diseases. He was also a gifted musician and his musical knowledge helped him to perceive differences in tone when the chest wall was tapped. For years he had observed the changes in tone caused by diseases of the lungs or the hearts of his patients. He would check his findings by dissections of corpses and by experimentation with wine barrels. He published his discovery in Vienna in 1761 in a book entitled “A New Discovery that Enables the Physician from the Percussion of the Human Thorax to Detect the Diseases Hidden Within the Chest”. In it he describes which sounds are characteristic in different diseases of the chest. If one taps the fingertips on a healthy

chest wall, one will perceive a sound like that of a drum. Diseases of the chest cavity change the normal tone of the tapping to sinus altior (high or tympanic sound as in a pneumothorax), a sonus obscurior (indistinct sound as in consolidation), or a sonus carnis percussae (dull sound as in a pleural effusion). His small book is today recognized as one of the great classics in medical literature. On November 12, 1783, he was knighted for his contributions to medicine by the Hapsburg emperor Joseph II, the brother of Marie-Antoinette.

His diagnostic sign remains today the single most useful examination method of detecting pleural effusions, which results in what Auenbrugger would have described as a “sonus carnis percussae”.

PLEURAL EFFUSION

Introduction

Pleural effusion refers to the accumulation of fluid within the pleural space.

Diagnosis is usually made on the basis of clinical findings and a CXR.

Occasionally an ultrasound or CT scan is required to definitively make the diagnosis.

Pleural fluid aspiration will be required for diagnostic purposes, or occasionally for symptomatic relief of dyspnea.

Pathology

The causes of pleural effusion are traditionally divided into those that are predominantly transudates and those which are predominantly exudates; although there is overlap in these with the cut off margin being somewhat arbitrary.

These causes include:

Transudates:

1. CCF
2. Hypo-albuminemic states.
3. Hypothyroidism
4. Meig's syndrome.

Exudates:

1. Infective (including TB).
2. Malignant.
3. Connective tissue disease.

4. Subdiaphragmatic sources:
 - e.g. subphrenic abscess, pancreatitis.
5. Irradiation
6. Trauma.

Clinical assessment

Important points of history:

1. Asses the degree of dyspnea.
2. Check for other important respiratory symptoms, such as cough, hemoptysis.
3. Check for important cardiac failure symptoms, such as orthopnea and exceptional dyspnea
4. Risk factors for chest malignancy, such as smoking or asbestos exposure
5. Risk factors for tuberculosis
6. Any history of trauma
7. Medications, including warfarin.

Important points of examination:

1. Vital signs/ pulse oximetry
2. Clinical signs on the effected side include:
 - Reduced breath sounds
 - Reduced vocal resonance
 - Dull percussion note

Investigations

The degree and type of investigation will depend on whether a specific diagnosis is being pursued as well as for any secondary complications.

The following may be considered:

Blood tests

1. FBE

2. CRP
3. U&Es/ glucose
4. Clotting profile.
5. ABGs

Plain radiography

The diagnosis of pleural effusion is usually made on clinical signs and confirmed with a CXR.



Typical appearance of a moderate right sided pleural effusion. This effusion was in a 37 year old man. There is an upper meniscus level, confirming that fluid is present in the pleural space. A perfectly horizontal level suggests the co-existence of the pneumothorax. The opacity is dense and homogenous suggesting a pleural effusion. The presence of air bronchograms is more suggestive of consolidation.



A “tension pleural effusion” in a 66 year old female, with lung cancer. She presented with severe dyspnea and hypotension. There is complete “white out” of the left hemithorax, and mild deviation of the trachea away from the effusion. She had virtual complete resolution of symptoms following pigtail catheter drainage of 2 liters of fluid from the left pleural space.

Ultrasound

This is useful to confirm effusion, when plain radiology is inconclusive.

It is also very useful when underlying consolidation or malignant disease is present, in the sense of assisting in ruling out lung mass lesions or loculations near to where a pleural aspiration is to be performed.

CT scan

This again is useful to confirm effusion, when plain radiology is inconclusive

It is also useful for delineating possible underlying associated lung pathology, such as malignancy or consolidation.

Pleural aspiration

Undiagnosed cases will usually require a diagnostic aspirate.

Fluid should be sent for:

- M&C (including for acid fast stain for AFBs).
- Cell counts (RBCs, neutrophils, lymphocytes).
- Cytology.
- Biochemistry.

Protein and LDH will help distinguish exudate from transudate.¹

EXUDATES	TRANSUDATES
Protein >30gm / L	<30gm / L
LDH >200 IU / L	<200 IU / L
<u>Pleural Serum Protein</u> > 0.5	<0.5
<u>Pleural Serum LDH</u> > 0.6	<0.6

- pH (<7.2 More acidic generally means infection).
- Glucose (reduced with infection and rheumatoid arthritis).
- Rheumatoid factor.
- Triglycerides (chylous effusions, eg. thoracic duct lesions).

Management

Pleural effusions of themselves do not generally require specific treatment unless they are so large that they are causing significant dyspnea.

1. Pleural tap:

Usual indications will be for:

- Relief of dyspnoea
- Diagnostic purposes.

Pleural effusions are a cause of dyspnoea only when **large**.

If the effusion is smaller and/or there is significant associated lung pathology (eg: tumour, consolidation, adhesions with loculation of fluid), then it is better to refer these cases to the Radiology Department for a tap under ultrasonic guidance.

2. Treatment of the underlying cause.
3. Pleurodesis:
 - Pleurodesis is considered for patients with large recurrent symptomatic effusions, particularly in cases of malignant disease.

References

1. Internal Medicine: The Essential Facts. Nicholas Talley, 1st ed 1990

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