RADY 403 Case Presentation

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Focused patient history and workup

• 10 year old male s/p laryngotracheal reconstruction who is now on mechanical ventilator
List of imaging studies

• Portable chest radiographs
Lines and Tubes
Lines and Tubes

Endotracheal Tube at the level of clavicle
Lines and Tubes

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Endotracheal Tube at the level of clavicle

Chest wall drain over the left hemithorax s/p rib harvest
Lines and Tubes

Endotracheal Tube at the level of clavicle

Chest wall drain over the left hemithorax s/p rib harvest
Lines and Tubes

- Endotracheal Tube at the level of clavicle
- Chest wall drain over the left hemithorax s/p rib harvest
- Feeding tube with guide wire in the distal stomach/proximal small bowel
Endotracheal Tube at the level of clavicle

Chest wall drain over the left hemithorax s/p rib harvest

Feeding tube with guide wire in the distal stomach/proximal small bowel

Lines and Tubes
**Lines and Tubes**

- **Endotracheal Tube** at the level of clavicle
- **Mediastinal clip** at the level of ductus
- **Chest wall drain** over the left hemithorax s/p rib harvest
- **Feeding tube with guide wire** in the distal stomach/proximal small bowel
Findings on the Chest Radiograph (AP View)

1. Absence of lung markings on the left side
Findings on the Chest Radiograph (AP View)

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2. Deepening of the left costophrenic angle
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3. Rightward shift of the mediastinum
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Diagnosis?
Findings on the Chest Radiograph (AP View)

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Diagnosis?

Tension pneumothorax on the left !!
How did we treat this patient?
How did we treat this patient?

Small-bore Chest Tube (Pigtail Catheter)
How did we treat this patient?

Chest radiograph before chest tube was placed:
Visible visceral pleural line
Absent lung markings on the left
Deep sulcus sign

Small-bore Chest Tube (Pigtail Catheter)
How did we treat this patient?

Chest radiograph before chest tube was placed:
- Visible visceral pleural line
- Absent lung markings on the left
- Deep sulcus sign

Small-bore Chest Tube (Pigtail Catheter)

Chest radiograph after chest tube was removed:
- No visceral pleural line visible
- No absent lung markings
- No deep sulcus sign
What is pneumothorax?

• When air enters the pleural space, the negative pressure in the pleural space rises higher than the intra-alveolar pressure
• Results in lung collapse
What are the types of pneumothorax?

• Simple: no shift of the mediastinal structures
What are the types of pneumothorax?

• Simple: no shift of the mediastinal structures

• Tension: shift of the mediastinal structures away from the side of the pneumothorax
  LIFE THREATENING CONDITION
  Pt is hemodynamically unstable. Increased central venous pressure causes obstructive shock!
What are the image findings on a radiograph for pneumothorax?

• Visceral pleural line . . . a must for the diagnosis

Usually visceral and parietal pleura are not visible
When air enters the pleural space, the visceral pleura retracts and becomes visible
What are the image findings on a radiograph for pneumothorax?

• Visceral pleural line . . . a must for the diagnosis

• Convex curve of the visceral pleural line paralleling the contour of the chest wall
What are the image findings on a radiograph for pneumothorax?

- Visceral pleural line . . . a must for the diagnosis
- Convex curve of the visceral pleural line paralleling the contour of the chest wall
- An absence of lung markings peripheral to the visceral pleural line (most times)
What are the image findings on a radiograph for pneumothorax?

• Visceral pleural line . . . a must for the diagnosis

• Convex curve of the visceral pleural line paralleling the contour of the chest wall

• An absence of lung markings peripheral to the visceral pleural line (most times)

• The deep sulcus sign of an inferiorly displaced costophrenic angle on a supine chest

Solid black arrow: deep sulcus sign with left costophrenic sulcus displaced inferiorly compared to the right
What is the next step if you strongly suspect pneumothorax but not entirely sure?

- Lateral decubitus view of the chest
  - Air is more visible against the lateral chest wall than over the apex
What are some pitfalls when diagnosing pneumothorax with radiographs?

- **Absence of lung markings** mistaken as pneumothorax
  - These findings are also seen in:
    - Large cysts in the lungs
    - Pulmonary embolism (reduced perfusion causes hyperlucency of the affected region)
    - Hyperinflated lung from foreign body
  - Ensure that the visceral pleural is parallel to the curve of the chest wall
What are some pitfalls when diagnosing pneumothorax with radiographs?

- **Skin folds** mistaken as pneumothorax
  - Skin fold forms an edge and visceral line forms a line
What are some pitfalls when diagnosing pneumothorax with radiographs?

- **Medial border of the scapula** mistaken as pneumothorax
  - Scapula is usually high density

Solid white arrow: edge of scapula
*Image from Learning Radiology.*
Why does this matter?

• None of the previously mentioned diseases other than pneumothorax would be treated with the insertion of a chest tube.

• Accurate diagnosis of pneumothorax can help with early appropriate intervention (chest tube placement).
UNC Top Three

• Visceral pleural line is necessary for a diagnosis of pneumothorax

• Tension pneumothorax has mediastinal shift and is a life-threatening condition

• Avoid pitfalls when diagnosing pneumothorax for efficient diagnosis of pneumothorax
References


