
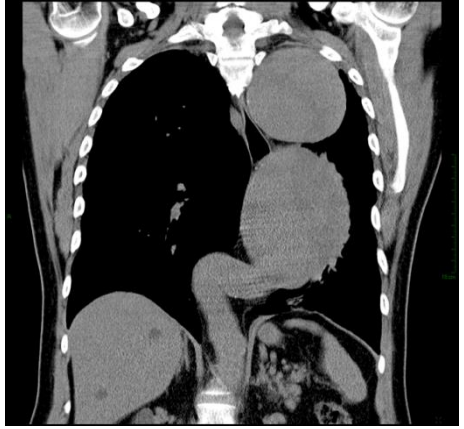
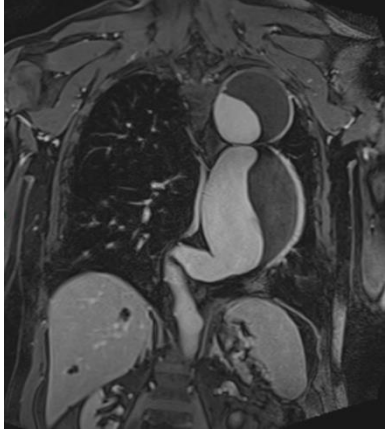
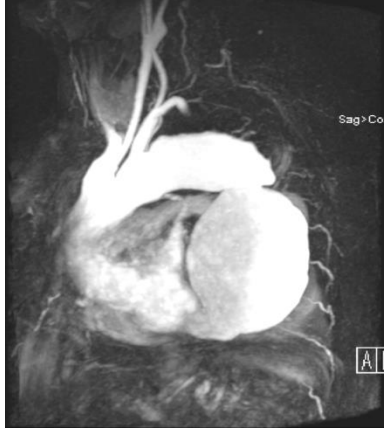

The mediastinum

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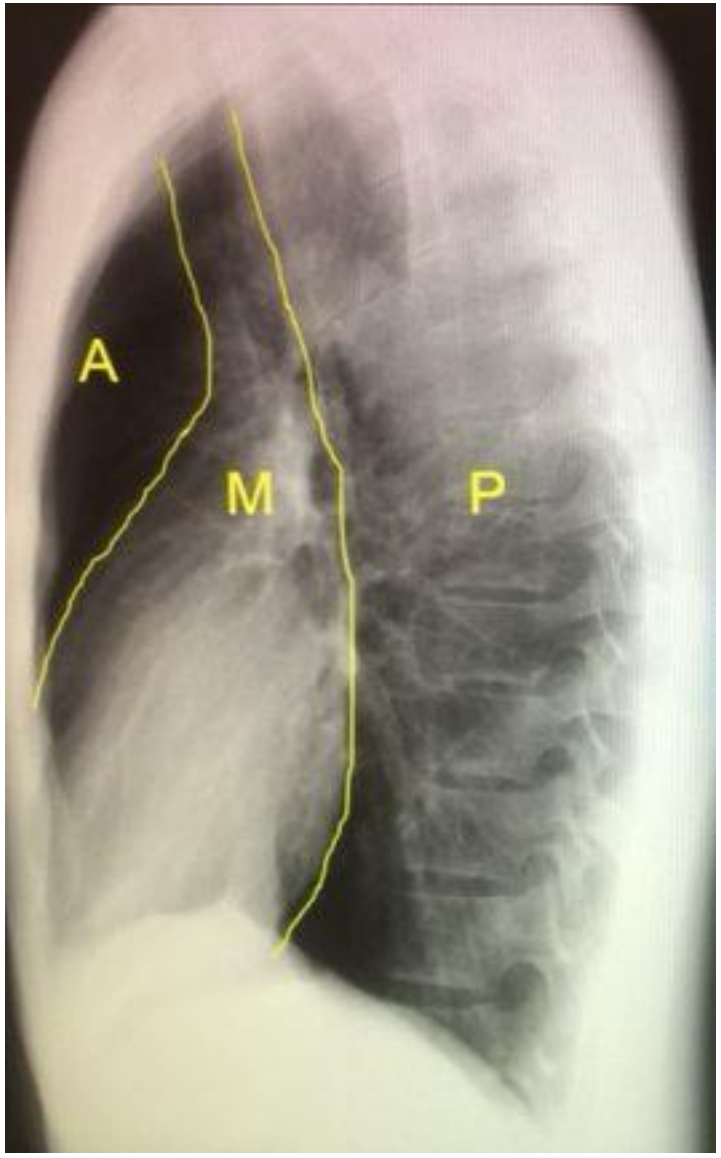
Cours RDGN 2331
04/02/21
16:30-18:00 hrs

Learning objectives

- To become familiar with the signs that indicate mediastinal pathology
- To confidently identify and localize a mediastinal mass on chest X-ray

Whitten classification of the mediastinal compartments



Compartment	Boundaries
A: anterior	• Superior: Thoracic inlet • Inferior: Diaphragm • Posterior: Pericardium, aorta, and brachiocephalic vessels
M: middle	• Superior: Thoracic inlet • Inferior: Diaphragm • Anterior: Pericardium • Posterior: Pericardium and posterior tracheal wall
P: posterior	• Superior: Thoracic inlet • Inferior: Diaphragm • Anterior: Posterior tracheal wall and pericardium

ITMIG Classification of Mediastinal Compartments and Multidisciplinary Approach to Mediastinal Masses[1]

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Abbreviations: FDG = fluorodeoxyglucose, ITMIG = International Thymic Malignancy Interest Group, JART = Japanese Association for Research on the Thymus, SUV_{max} = maximal standardized uptake value

RadioGraphics 2017; 37:413–436

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Content Codes: CH CT OI

[1]From the Department of Diagnostic Radiology, University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd, Unit 1478, Houston, TX 77030 (B.W.C., M.F.B., M.G., P.M.d.G., M.T.T.); Department of Radiology, Brigham and Women's Hospital, Boston, Mass (R.M.); Department of Radiology, Saint Luke's Hospital of Kansas City, University of Missouri–Kansas City School of Medicine, Kansas City, Mo (M.L.R.d.C.); and Department of Radiology, Chaim Sheba Medical Center, Tel Aviv,

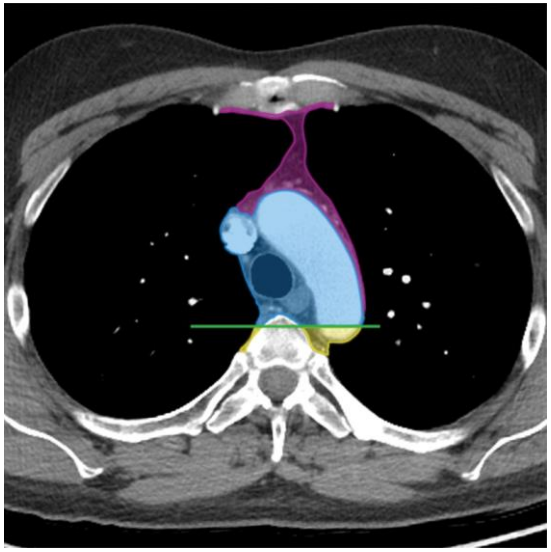
Division of the mediastinum into specific compartments is beneficial for a number of reasons, including generation of a focused differential diagnosis for mediastinal masses identified on imaging examinations, assistance in planning for biopsies and surgical procedures, and facilitation of communication between clinicians in a multidisciplinary setting. Several classification schemes for the mediastinum have been created and used to varying degrees in clinical practice. Most radiology classifications have been based on arbitrary landmarks outlined on the lateral chest radiograph. A new scheme based on cross-sectional imaging, principally multidetector computed tomography (CT), has been developed by the International Thymic Malignancy Interest Group (ITMIG) and accepted as a new standard. This clinical division scheme defines unique prevascular, visceral, and paravertebral compartments based on boundaries delineated by specific anatomic structures at multidetector CT. This new definition plays an important role in identification and characterization of mediastinal abnormalities, which, although uncommon and encompassing a wide variety of entities, can often be diagnosed with confidence based on location and imaging features alone. In other scenarios, a diagnosis may be suggested when radiologic features are combined with specific clinical information. In this article, the authors present the new multidetector CT–based classification of mediastinal compartments introduced by ITMIG and a structured approach to imaging evalu

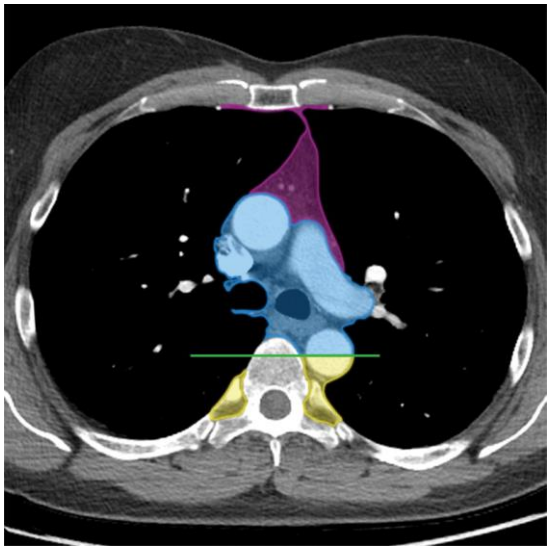
Carter BW, Benveniste MF, Madan R, et al. ITMIG Classification of Mediastinal Compartments and Multidisciplinary Approach to Mediastinal Masses. Radiographics 2017 Mar-Apr;37(2):413-436

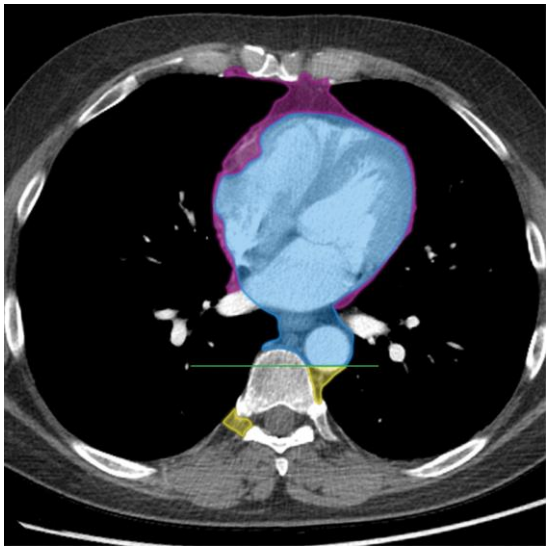
CT-based mediastinal compartment classification according to the international Thymic Malignancy Interest Group (ITMIG)

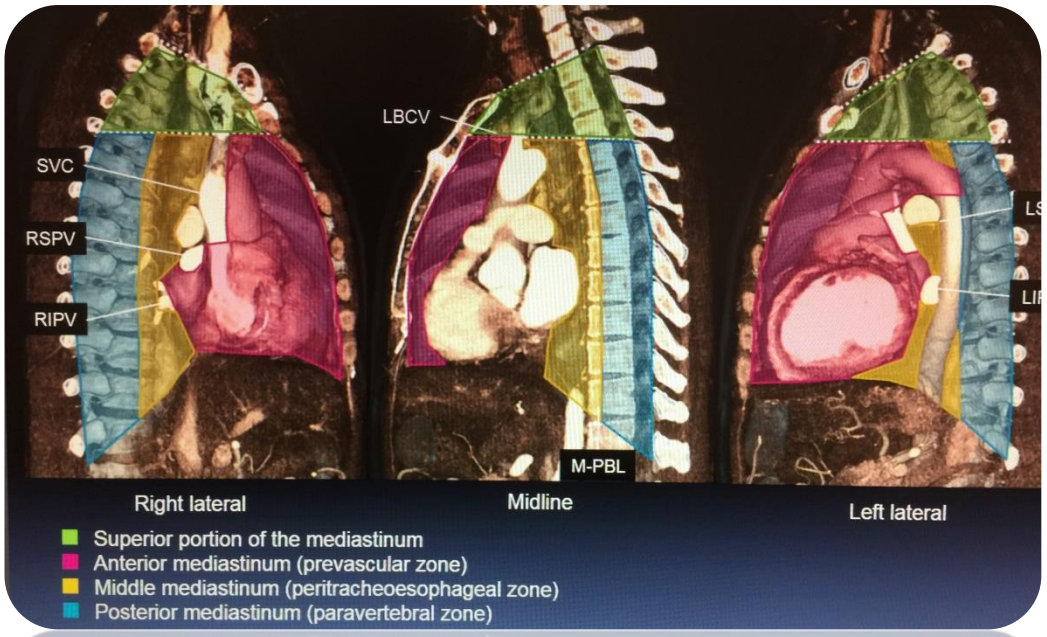
Compartment	Boundaries
❑ Prevascular	• Superior: Thoracic inlet • Inferior: Diaphragm • Lateral: Parietal (mediastinal) pleural reflections, ITCs, RSPV, LSPV, RIPV, LIPV • Posterior: Pericardium, SVC, RSPV, LSPV, RIPV, LIPV, ascending aorta, and lateral rim of the aortic arch
❑ Visceral	• Superior: Thoracic inlet • Inferior: Diaphragm • Anterior: Posterior boundaries of the prevascular compartment • Posterior boundary: V-PBL
❑ Paravertebral	• Superior: Thoracic inlet • Inferior: Diaphragm • Anterior: Posterior boundary of the visceral compartment • Posterior-lateral: Vertical line against the posterior margin of the chest wall at the lateral margin of the transverse process of the thoracic spine

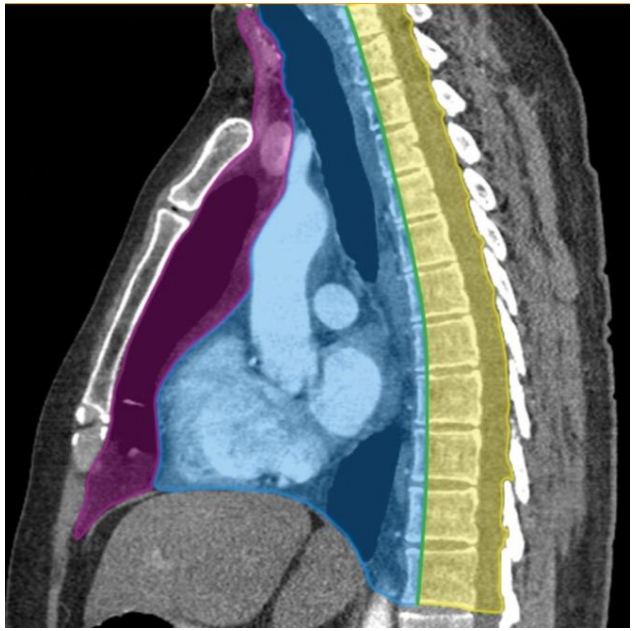
LBCV: left brachiocephalic vein, ITVs: internal thoracic vessels, SVC: superior vena cava, RSPV: right superior pulmonary vein, LSPV: left superior pulmonary vein, RIPV: right inferior pulmonary vein, LIPV: left inferior pulmonary vein, V-PBL: visceral paravertebral compartment boundary line (a vertical connecting a point on each thoracic vertebral body at 1cm behind its anterior margin)



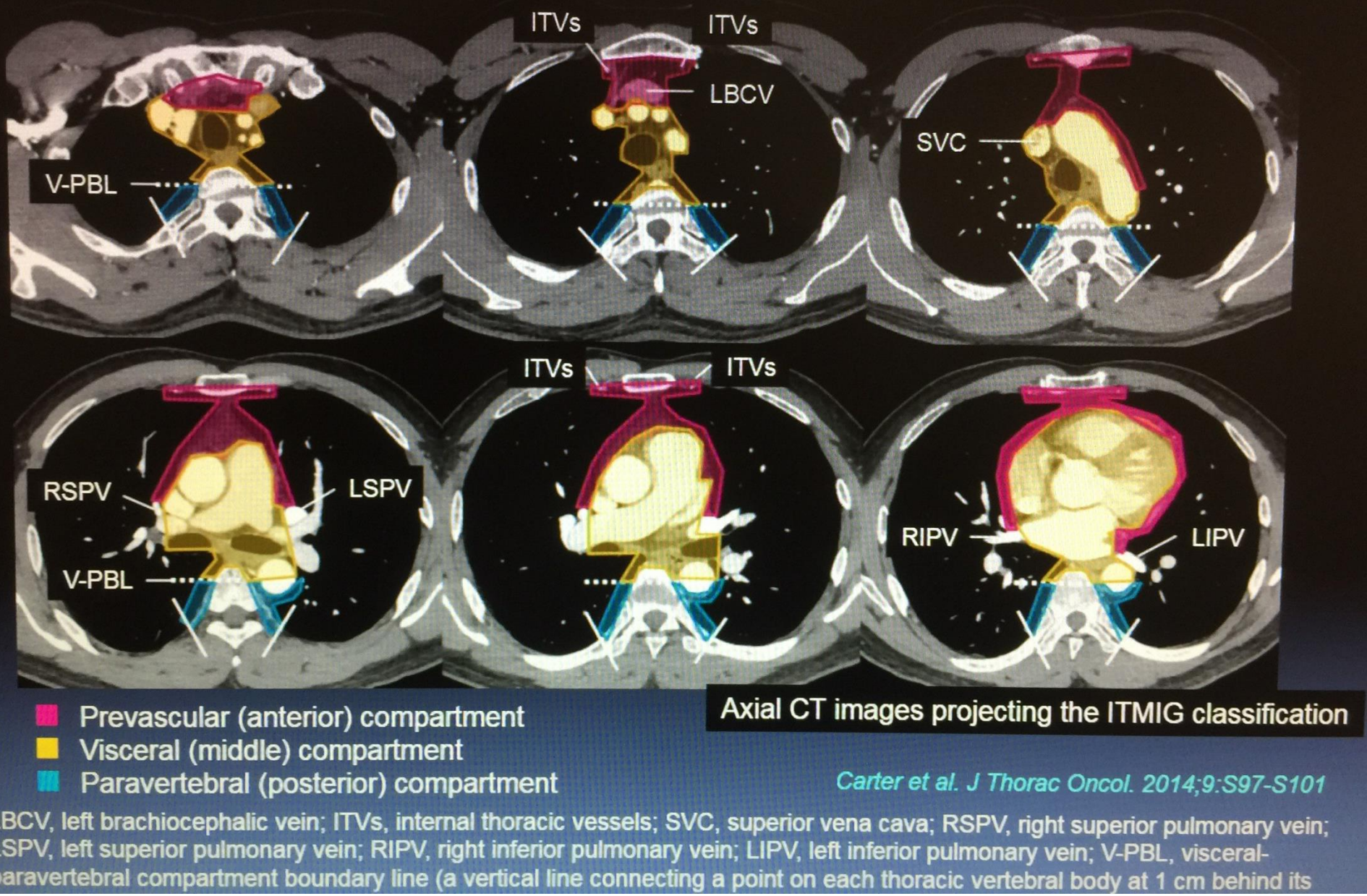








Nakazono T, et al. New CT-based mediastinal compartments classifications and differential diagnosis of mediastinal tumors. Poster RSNA 2017



Nakazono T, et al. New CT-based mediastinal compartments classifications and differential diagnosis of mediastinal tumors. Poster RSNA 2017

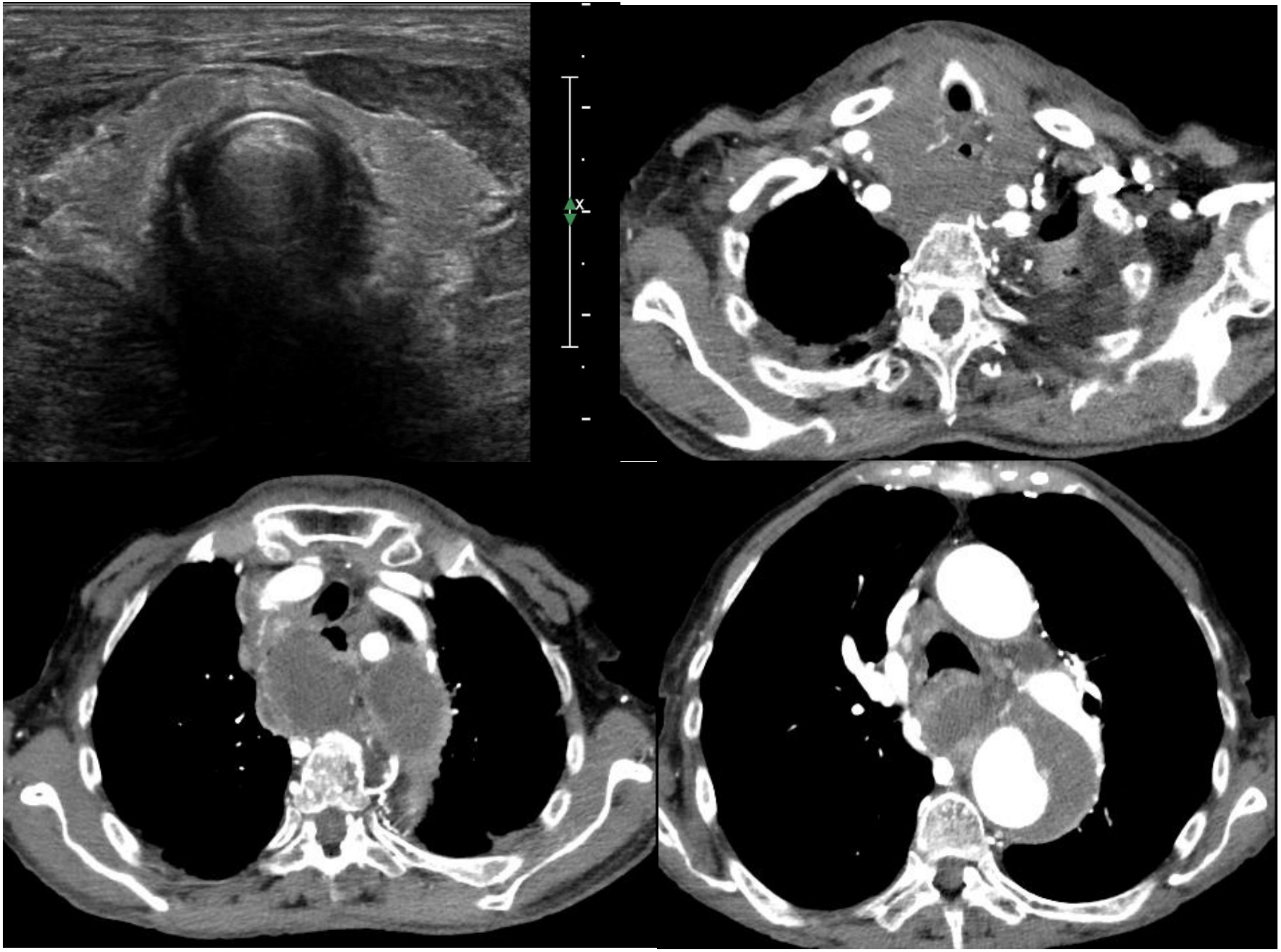
CT-based mediastinal compartment classification according to the international Thymic Malignancy Interest Group (ITMIG)

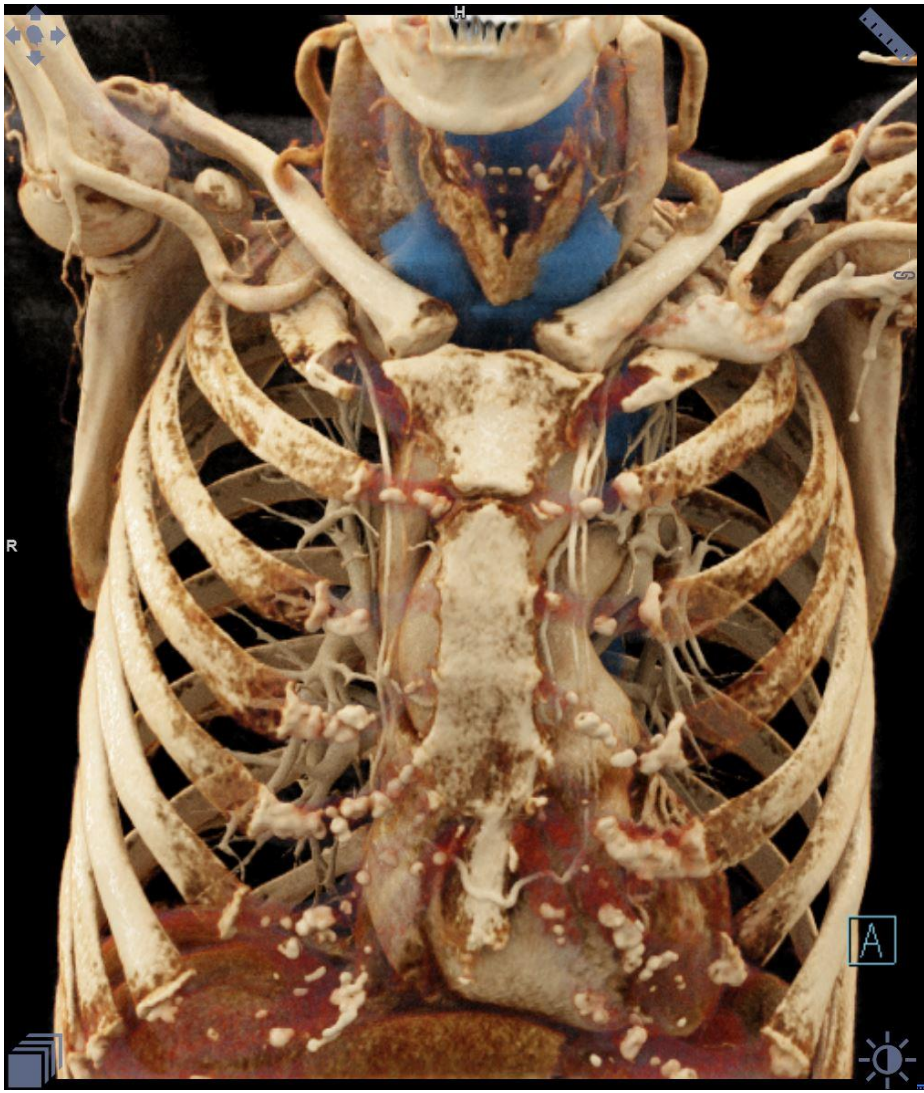
Compartment	Boundaries	Major Contents
Prevascular	Superior: thoracic inlet Inferior: diaphragm Anterior: sternum Lateral: parietal mediastinal pleura Posterior: anterior aspect of the pericardium as it wraps around the heart in a curvilinear fashion	Thymus Fat Lymph nodes Left brachiocephalic vein
Visceral	Superior: thoracic inlet Inferior: diaphragm Anterior: posterior boundaries of the prevascular compartment Posterior: vertical line connecting a point on each thoracic vertebral body 1 cm posterior to its anterior margin	Nonvascular: trachea, carina, esophagus, lymph nodes Vascular: heart, ascending thoracic aorta, aortic arch, descending thoracic aorta, superior vena cava, intrapericardial pulmonary arteries, thoracic duct
Paravertebral	Superior: thoracic inlet Inferior: diaphragm Anterior: posterior boundaries of the visceral compartment Posterolateral: vertical line against the posterior margin of the chest wall at the lateral margin of the transverse process of the thoracic spine	Thoracic spine Paravertebral soft tissues

Carter BW, Benveniste MF, Madan R, et al. ITMIG Classification of Mediastinal Compartments and Multidisciplinary Approach to Mediastinal Masses. Radiographics 2017 Mar-Apr;37(2):413-436

Anatomical boundaries

- In clinical practice, a pathological process is not necessarily primarely limited to one compartment
  - Infection
  - Hemorrhage
  - Neoplasia
- No true physical boundaries between the different compartments




H
R
A


H
P

Approach to the prevascular compartment

- The common neoplasms:
  - Thymic epithelial neoplasms
  - Lymphoma
  - Mature teratoma
  - Non teratomatous germ cell malignancies
  - Metastatic disease
- NonNeoplastic lesions
  - Substernal extension of thyroid goiter, thymic hyperplasia, cystic lesions such as thymic and pericardial cysts, and vascular-lymphatic abnormalities

Approach to the visceral compartment

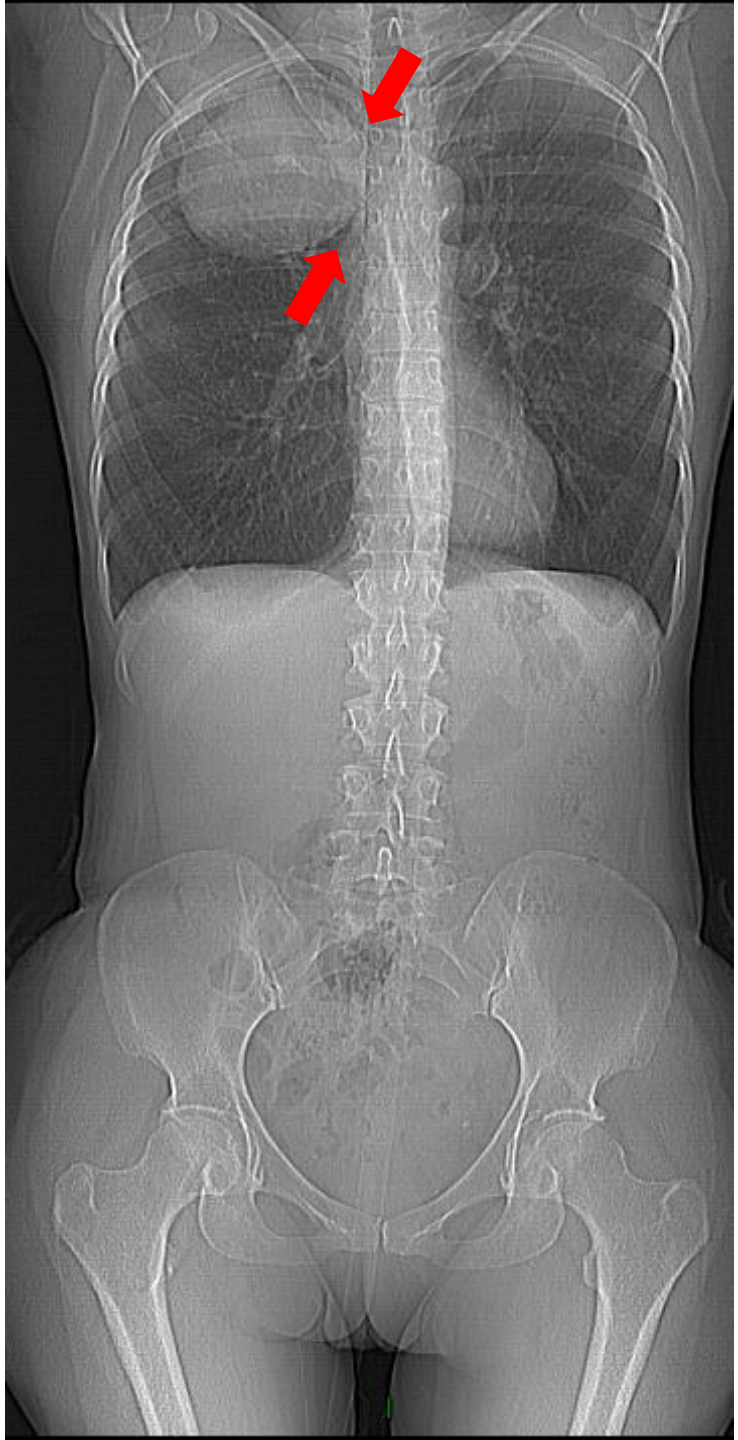
- The most significant lesions:
  - Neoplasms of the airways, esophagus, and lymph nodes
  - Non neoplastic abnormalities such as bronchogenic cysts and oesophageal duplication cysts

Approach to the paravertebral compartment

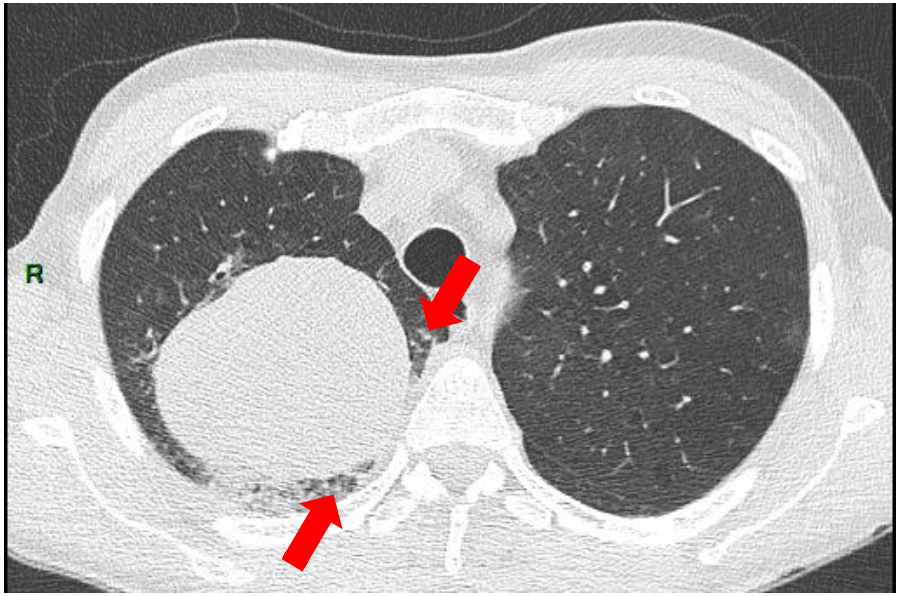
- Most lesions originating in this region
  - Neoplasms of neurogenic origin
- Other less common neoplastic conditions
  - Lymphoma, primary osseous tumors, and metastases
- Nonneoplastic causes
  - Thoracic spinal infection due to bacterial and mycobacterial agents, cystic lesions such as thoracic meningocele and neurenteric cyst and extramedullary hematopoiesis

Localize to the mediastinum

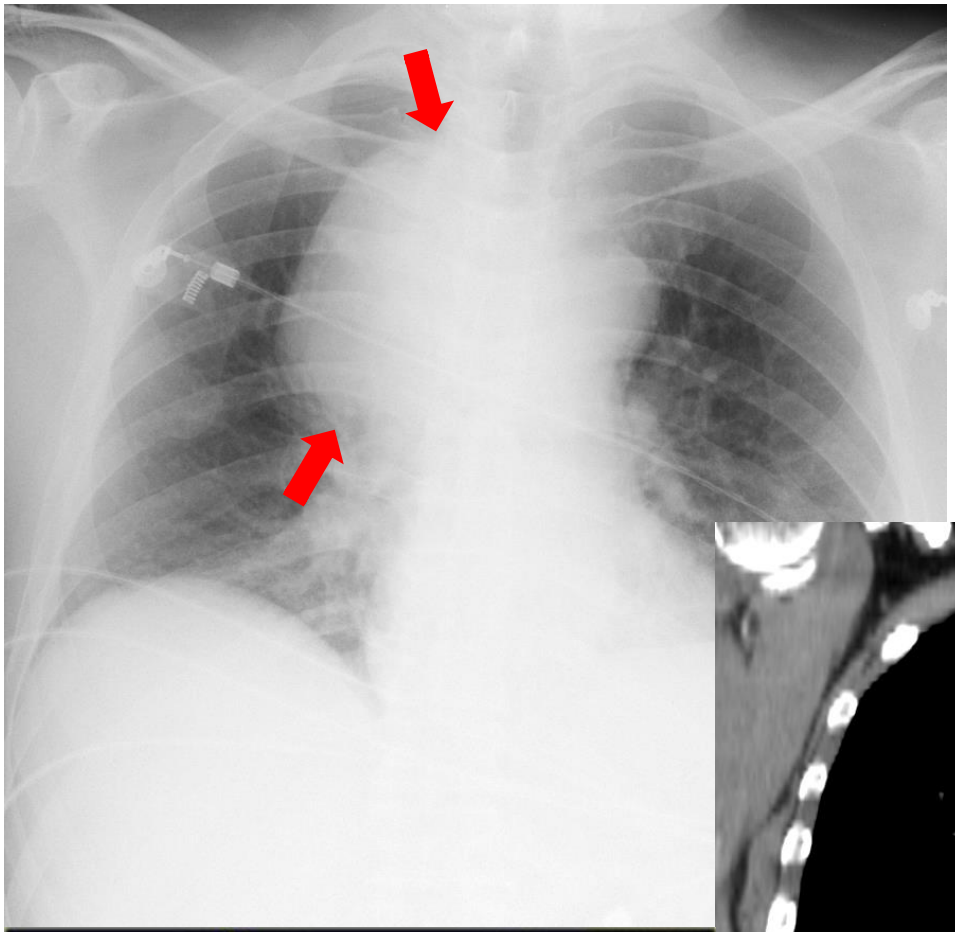
- A mediastinal mass will not contain air bronchograms
- The margins with the lungs will be obtuse
- Presence, distorsion of mediastinal lines, stripes can reveal mediastinal disease
- These findings can be used to localize masses in the pre-vascular, visceral and paravertebral mediastinum

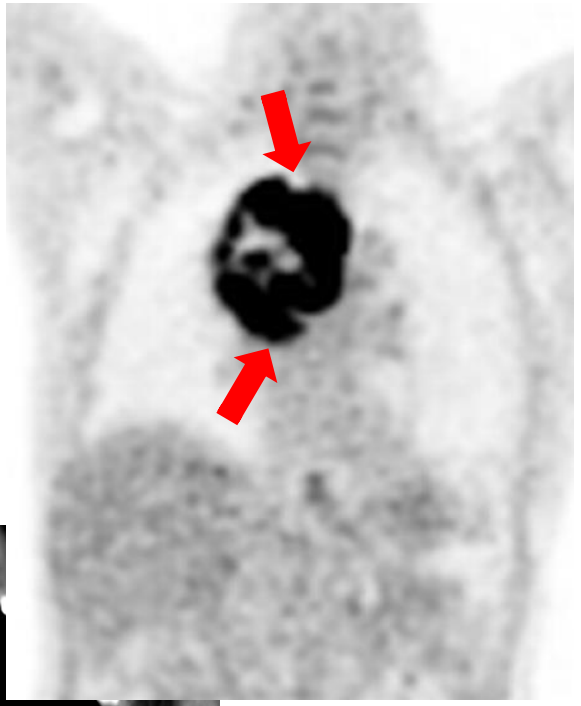


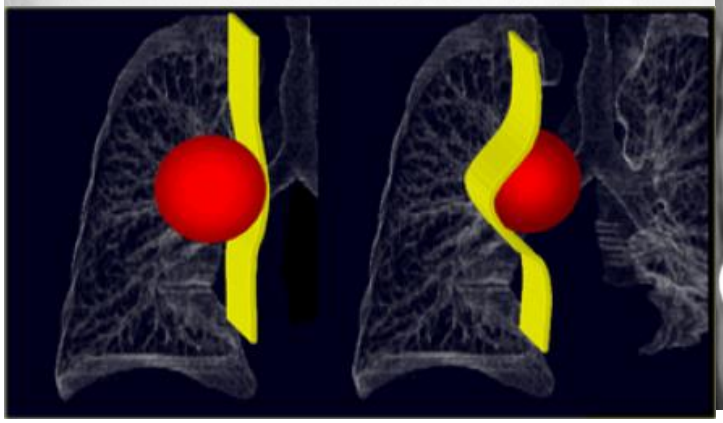
Lung or mediastinal lesion?



Lung carcinoma



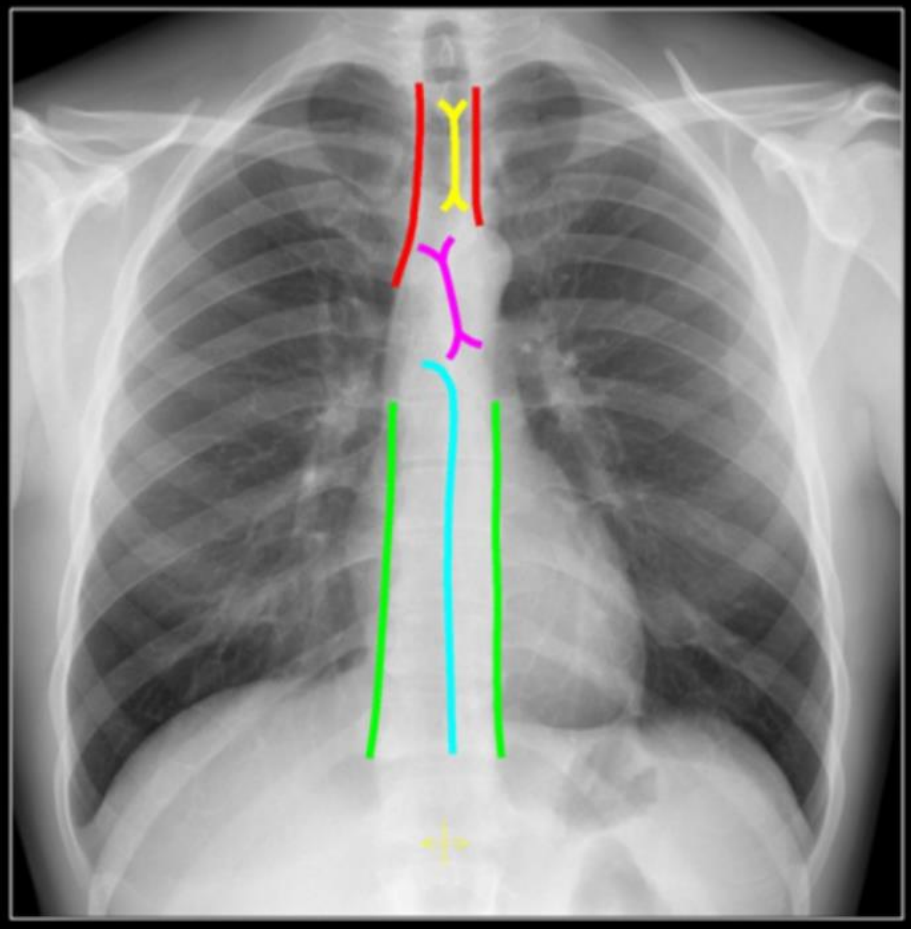


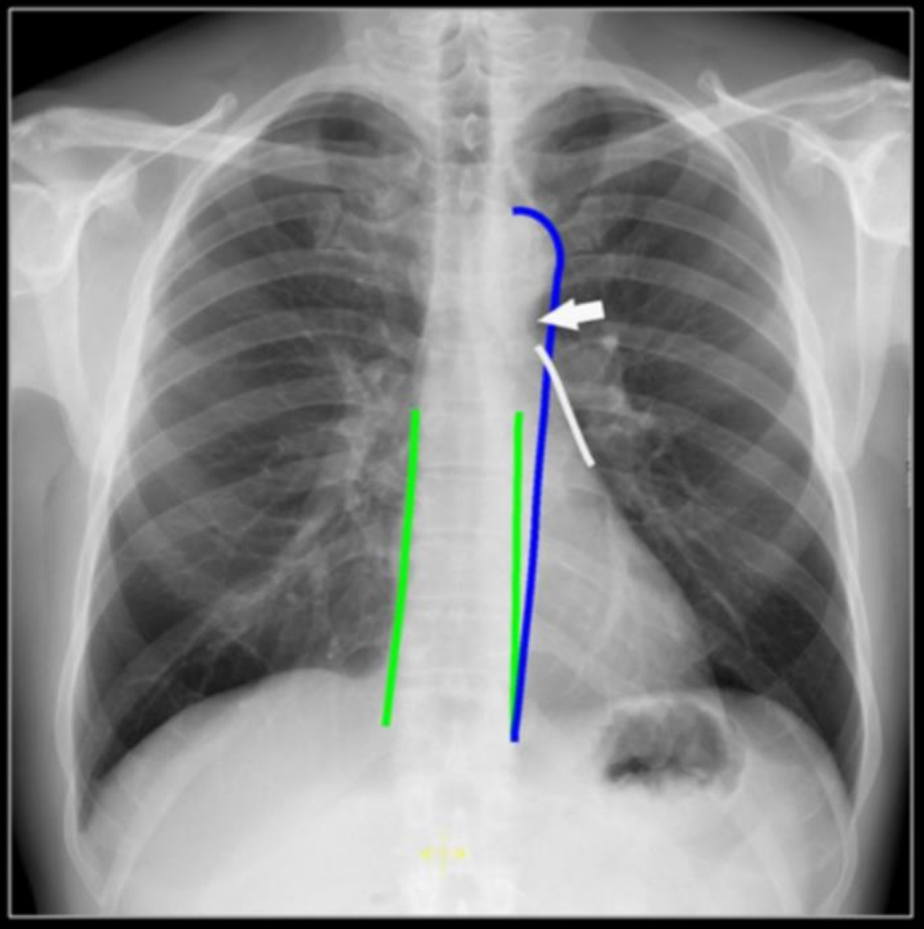


Mediastinal tumor

Definitions

- Lines typically measure less than 1 mm in width and are formed by air, typically within the lung, outlining thin intervening tissue on both sides
- Stripes are bands that result from air outlining thicker intervening mediastinal structures. The mediastinal stripes present on PA chest radiographs include the right and left paratracheal and paraspinal stripes





Posterior junction line

Right and left paratracheal stripes

Anterior junction line

Azygoesophageal recess

Right and left paraspinal stripes

Paraortic line

AP window reflection (arrow)

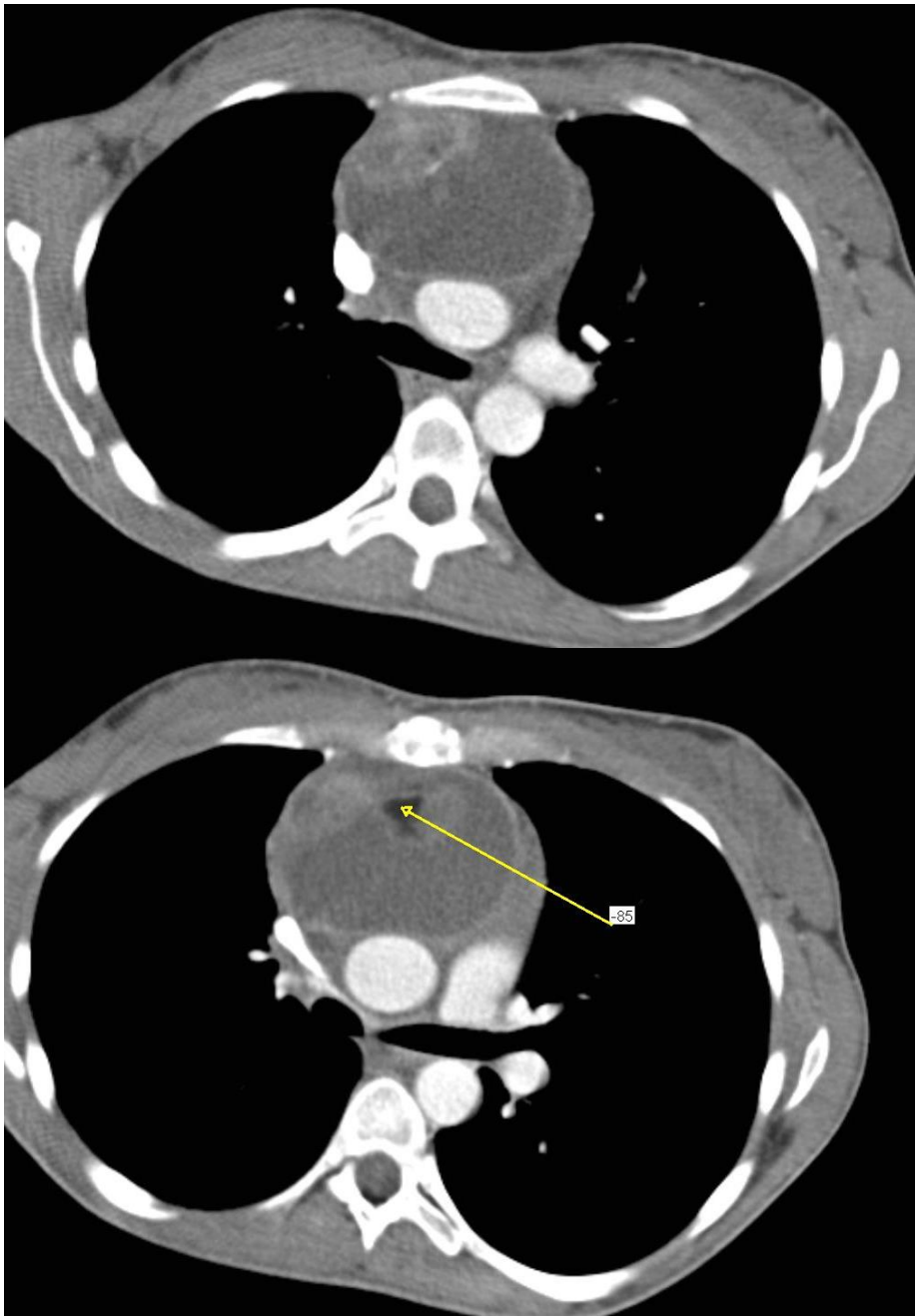
AP stripe

From Bystricka N et al. ECR2013 DOI: 10.1594/ecr2013/C-0442, certificate of Merit

Approach to diagnosis

- Localization: anterior, middle, posterior
- Tissue composition: fat, cystic component, calcifications, soft tissue
- There can be associated spinal, costal or sternal abnormalities
- When classical features are present, a presumptive diagnosis can often be made with a high degree of confidence
- For other cases, a combination of imaging features, clinical information/context is necessary

Dysgerminoma



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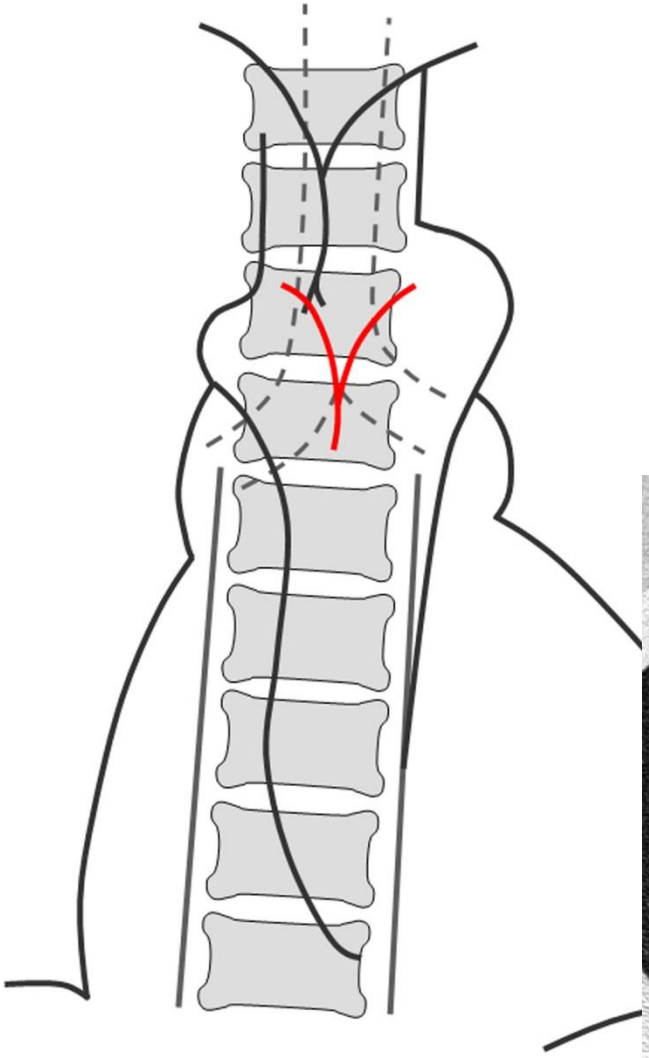
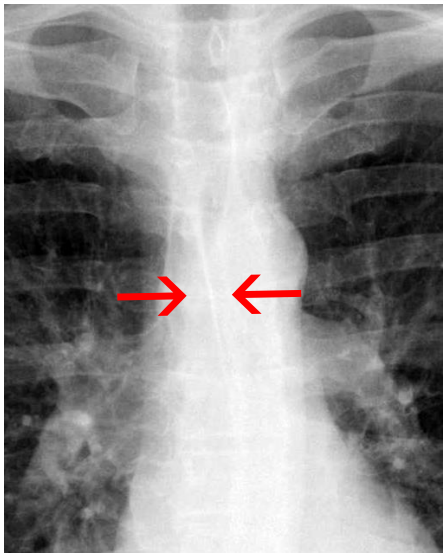
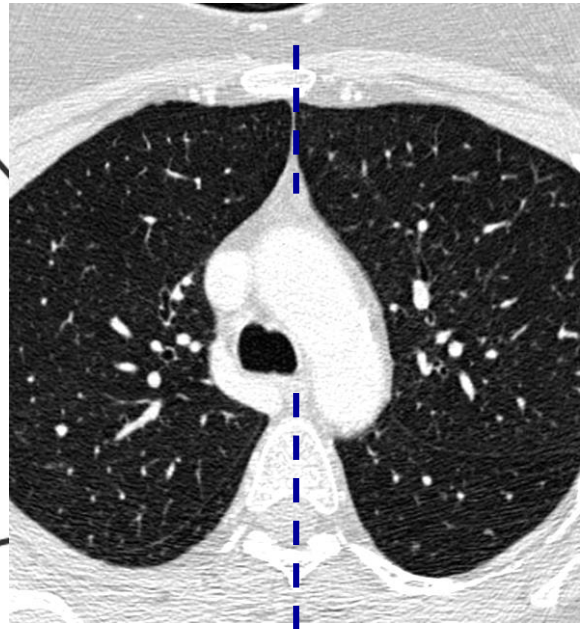
The anterior junction Line

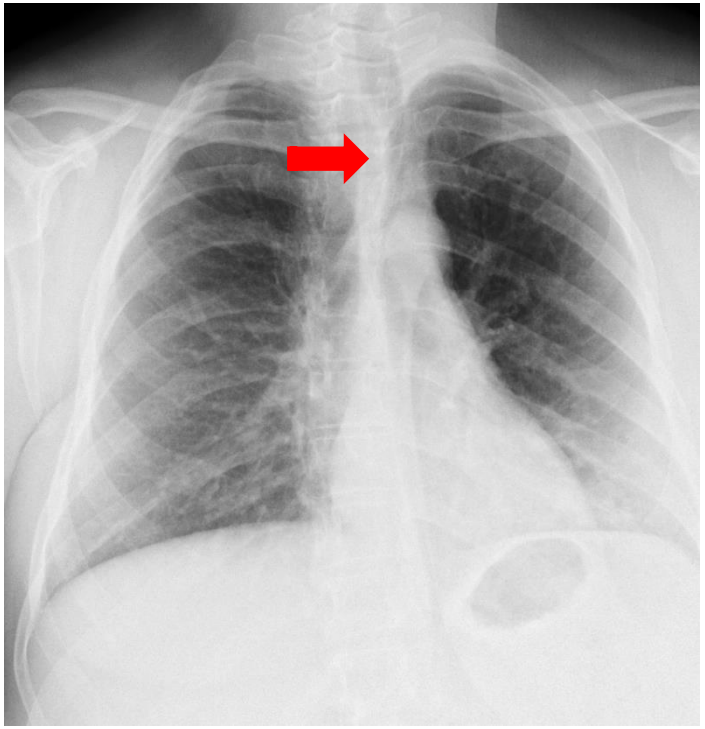


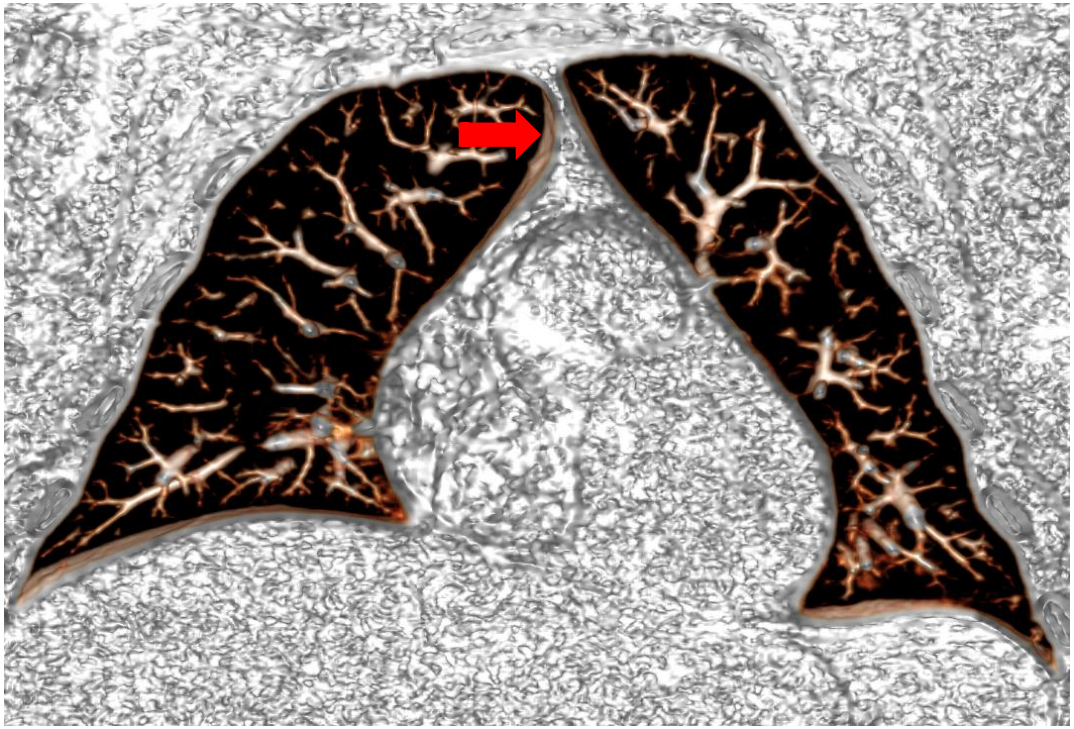




Anterior junction line results from the anterior apposition of the lungs, which lies behind the upper two-thirds of the sternum.

The line consists of four layers of pleura and a variable amount of intervening fat.





- ✓ Frequency of identification on chest radiographs : 24,5-57%
- ✓ It may be absent when its course is not tangential to the X-ray beam
- ✓ It can be obscured by other structures such as the heart, great vessels or the thoracic spine
- ✓ Obliteration or abnormal convexity suggest anterior mediastinal mass

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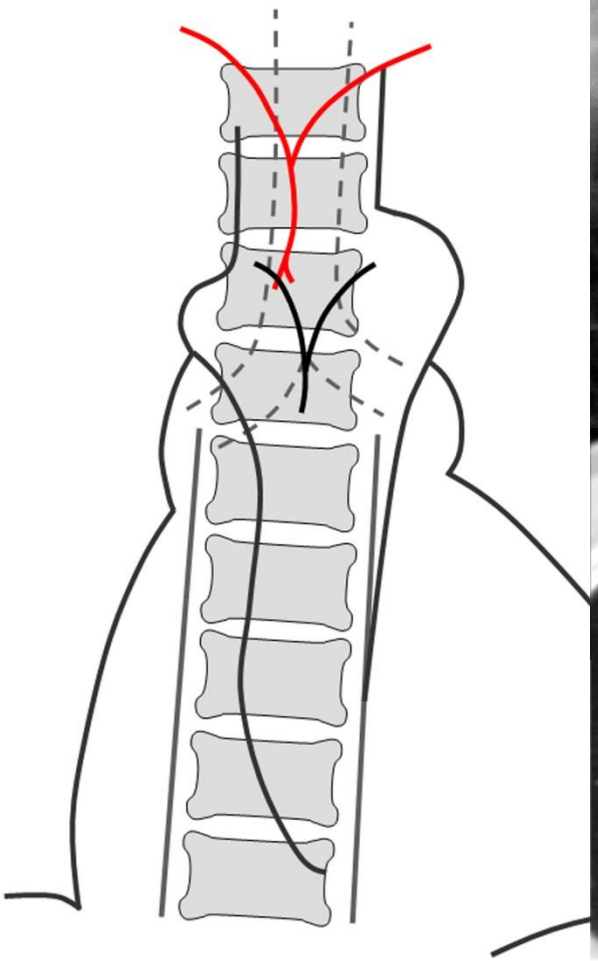
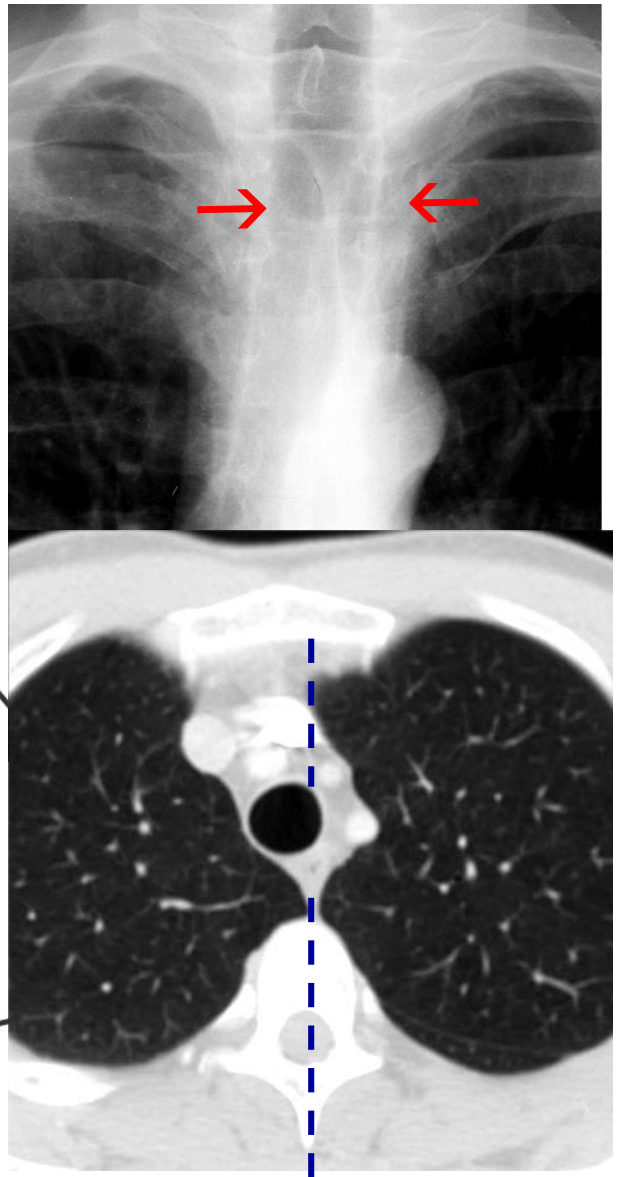
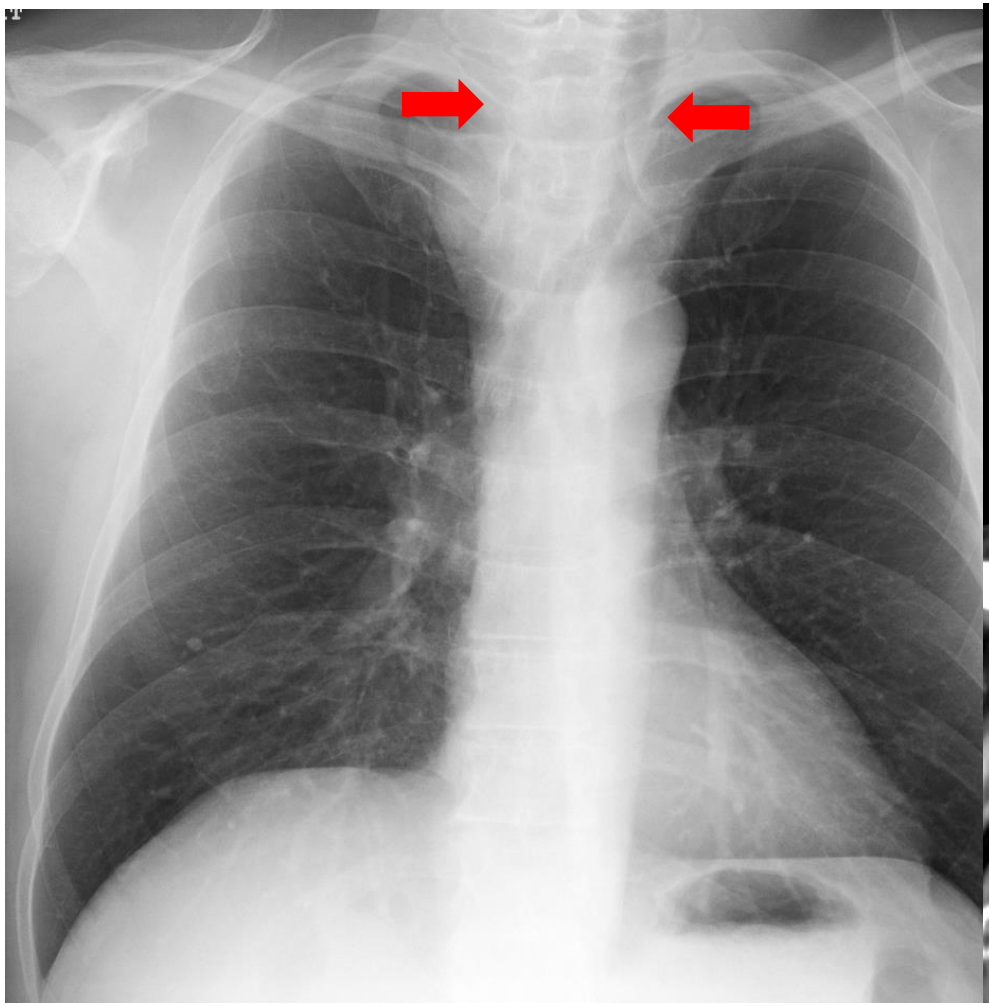
Gibbs JM et al. Lines and stripes: where did they go? From conventional radiography to CT. Radiographics 2007;27:33-48

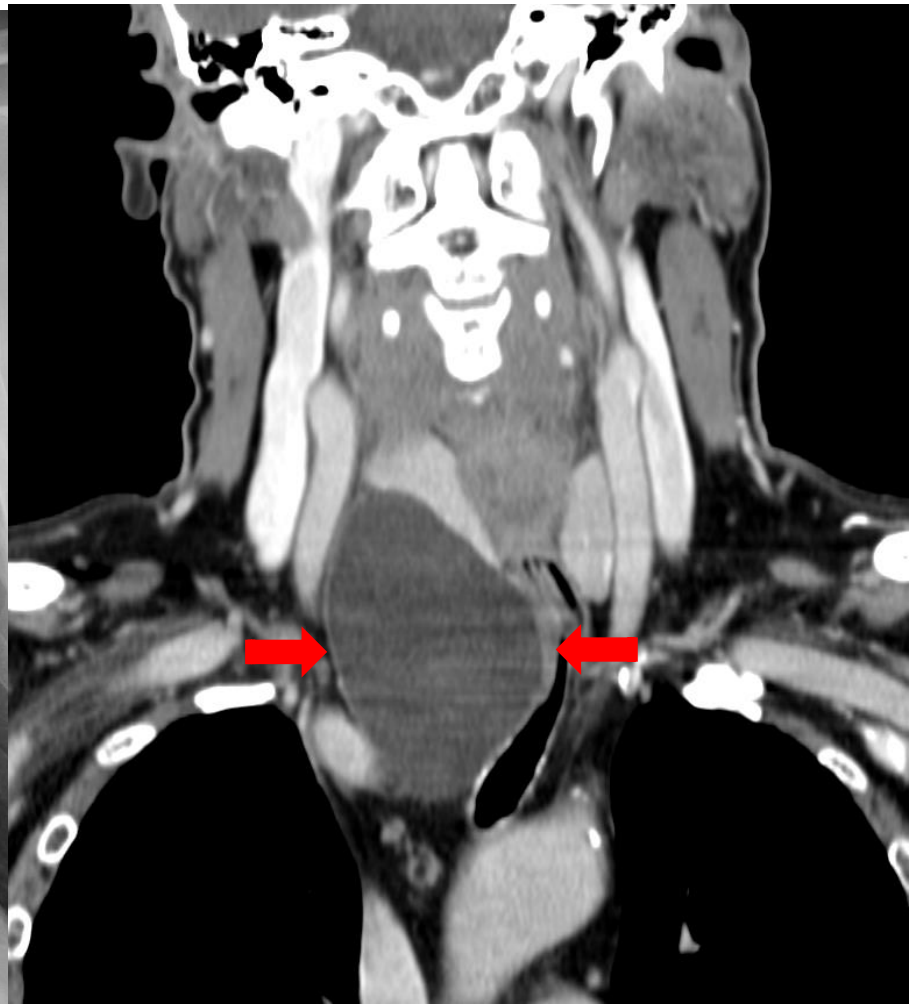
The posterior junction line





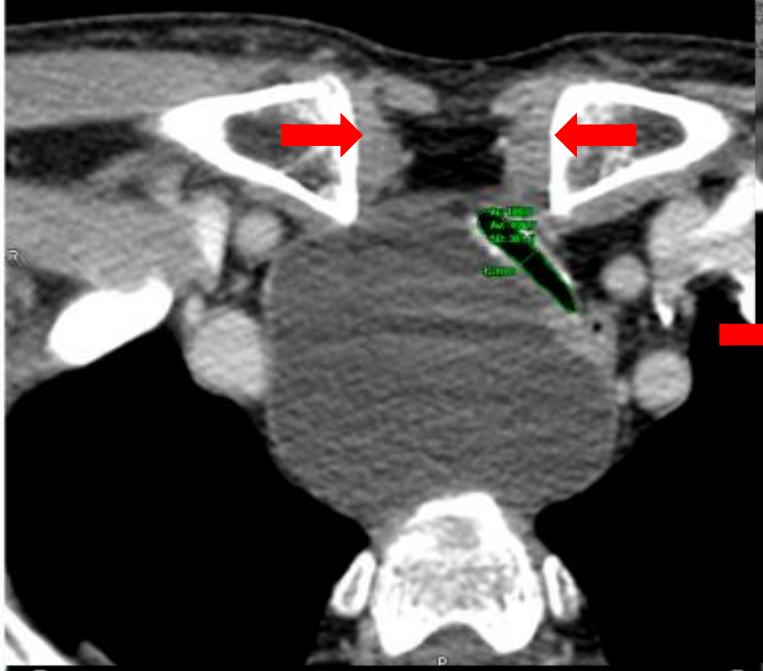
- ✓ Results from the apposition of the lungs posterior to the esophagus and anterior to the 3rd to 5th thoracic vertebrae.
- ✓ Similarly to anterior junction line, it is formed by four layers of pleura.
- ✓ Can be seen above the clavicles
- ✓ Frequency: 32%



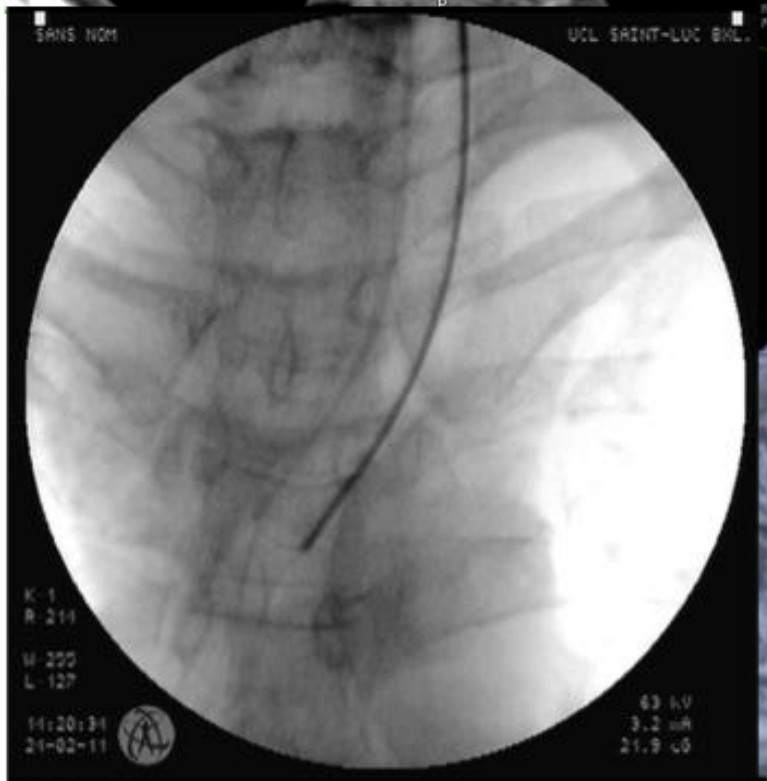


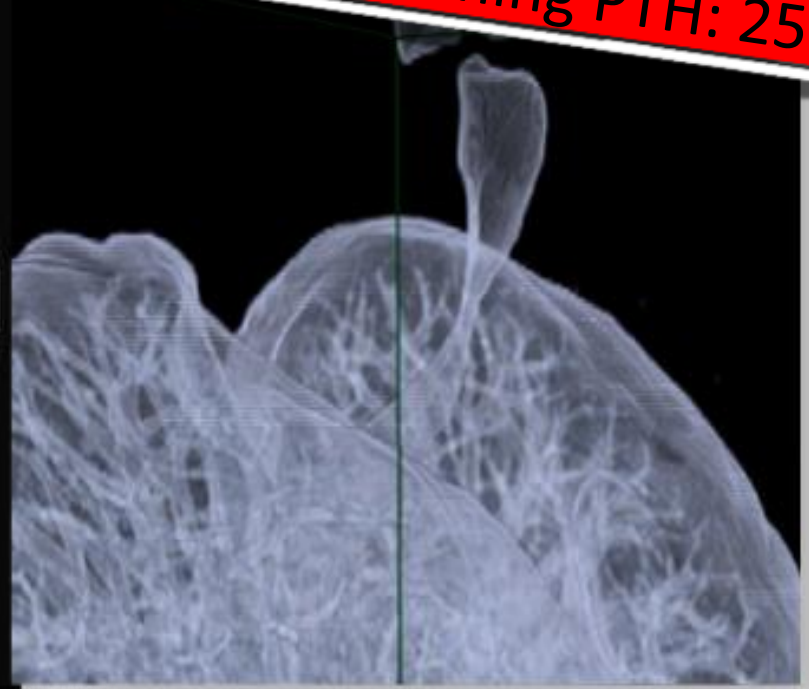
Abnormal bulging, convexity or obliteration of the posterior junction line suggests a posterior mediastinal abnormality

Further clues to the location of a mass can be inferred from the lateral margins of the mass above the clavicles

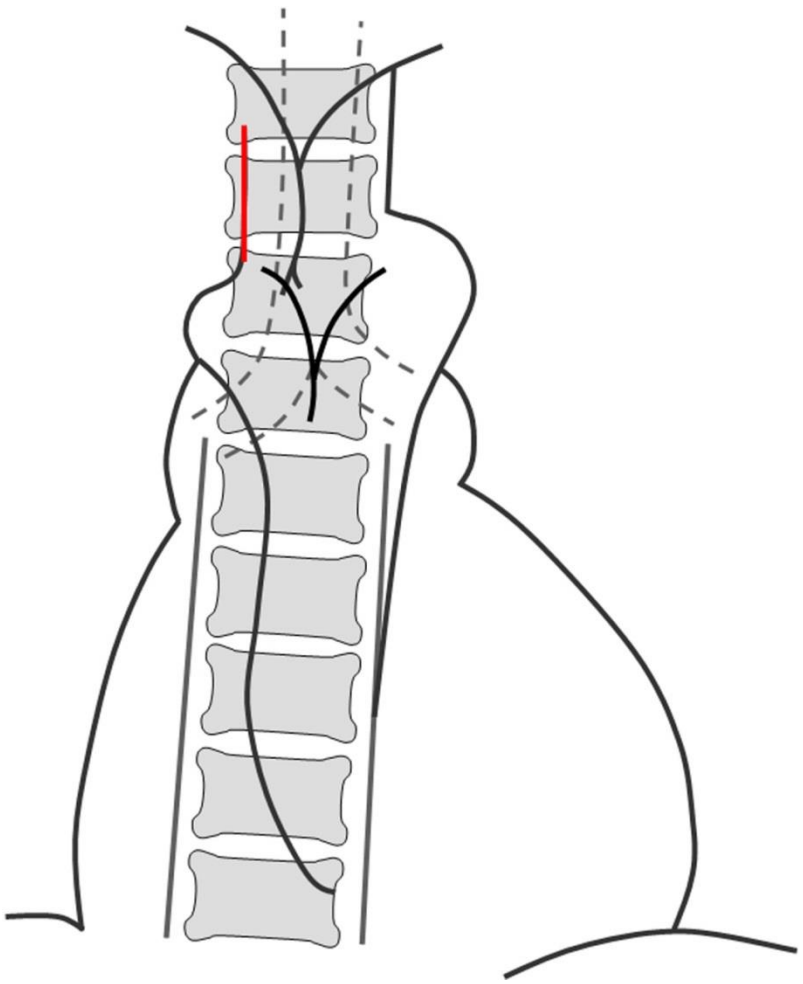


Fluid containing PTH: 256 pg/mL





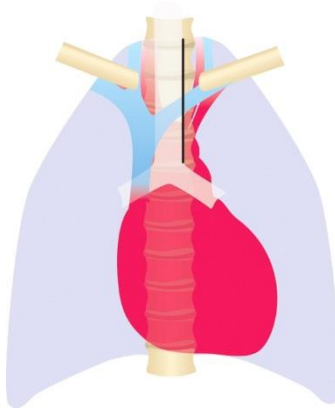
The right and left paratracheal stripes

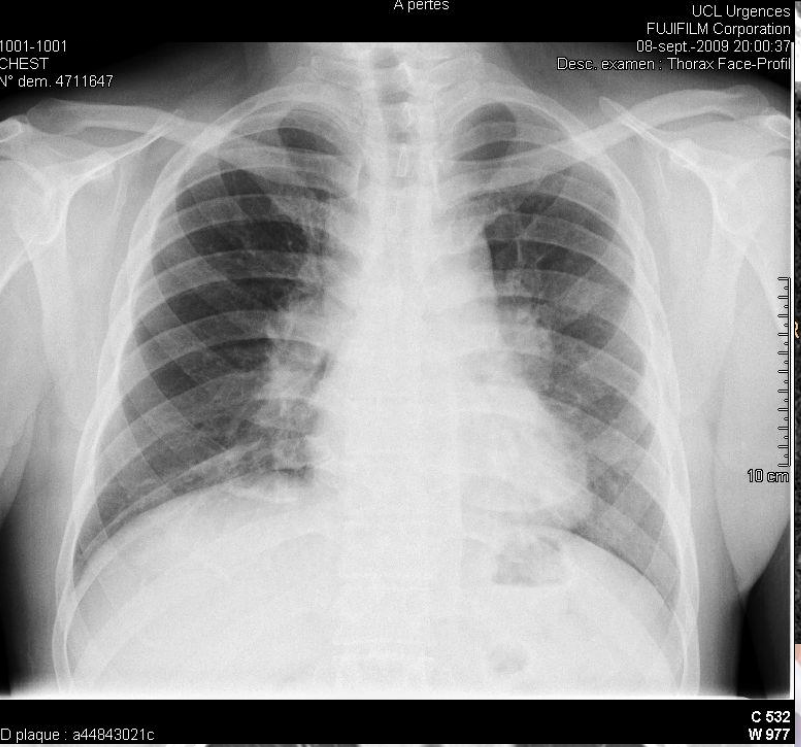


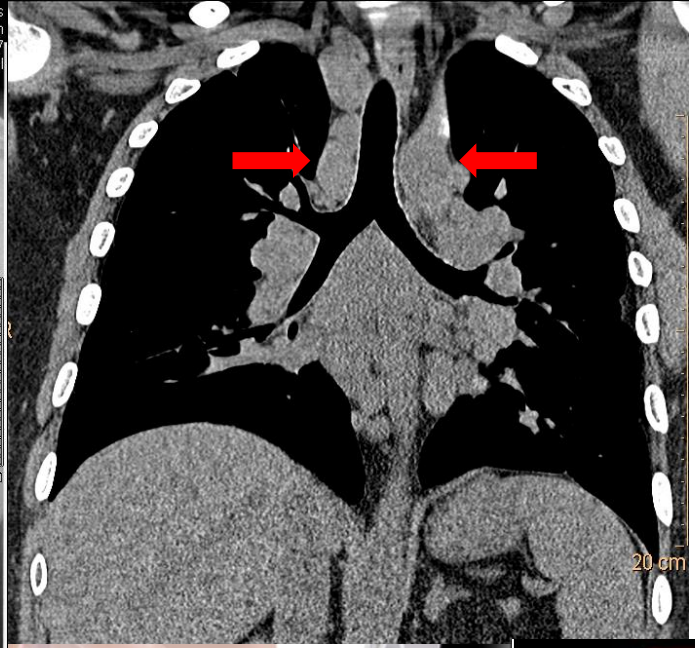
The right paratracheal stripe is formed by the tracheal wall, mediastinal connective tissue and paratracheal pleura. Air within the trachea and the aerated right upper lobe outline the intervening soft tissues.

Normal thickness of 1-4 mm

Presence: 97% R, 30% L







40-year old man

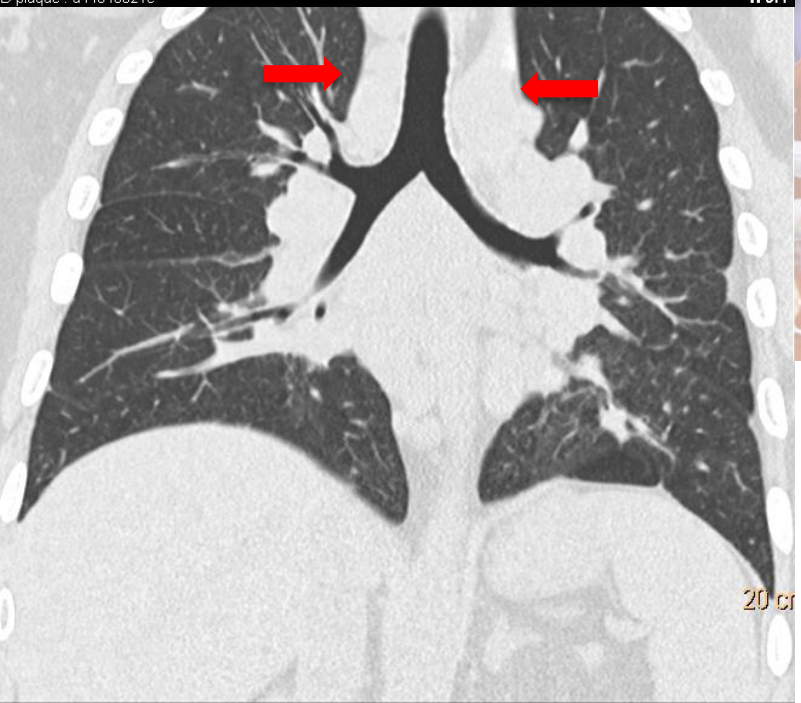
Previous lymphoma treated by chemotherapy

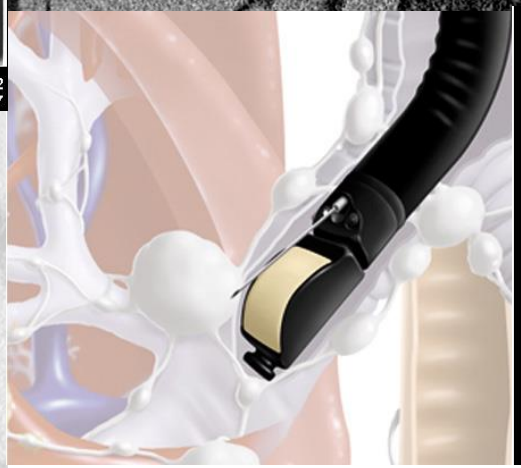
Poor appetite since several months

No fever

No arthralgia

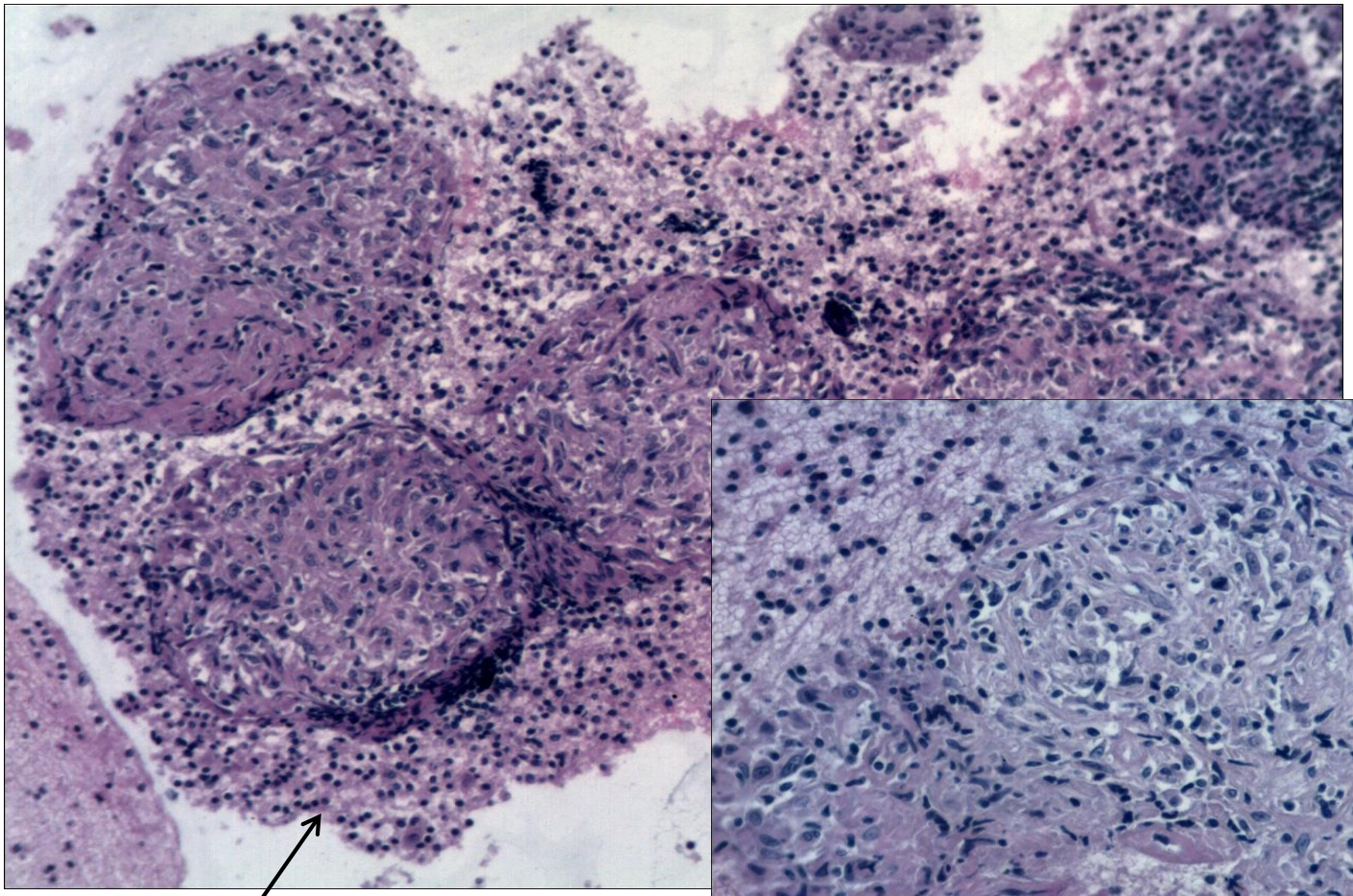
Abroad since several weeks





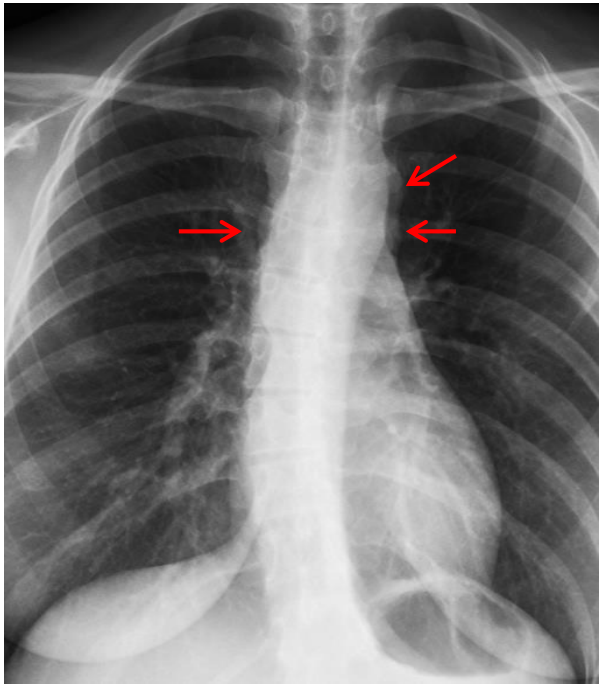
An abnormal contour or widening may be caused by pleural effusions or thickening, paratracheal lymphadenopathy, hematomas or neoplasm

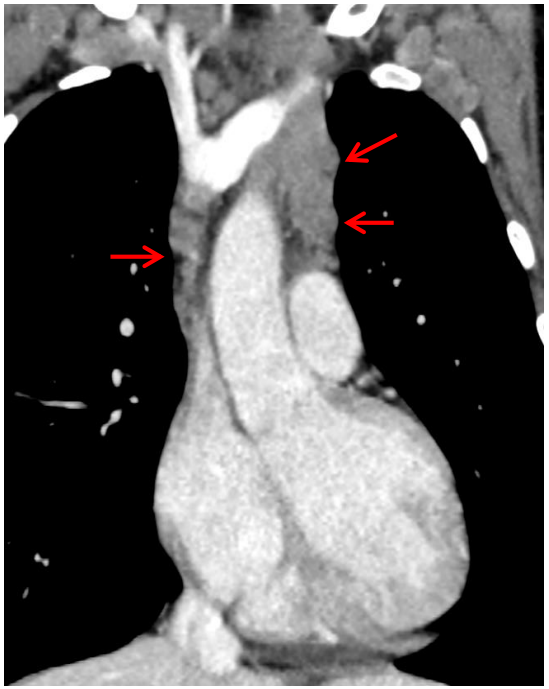
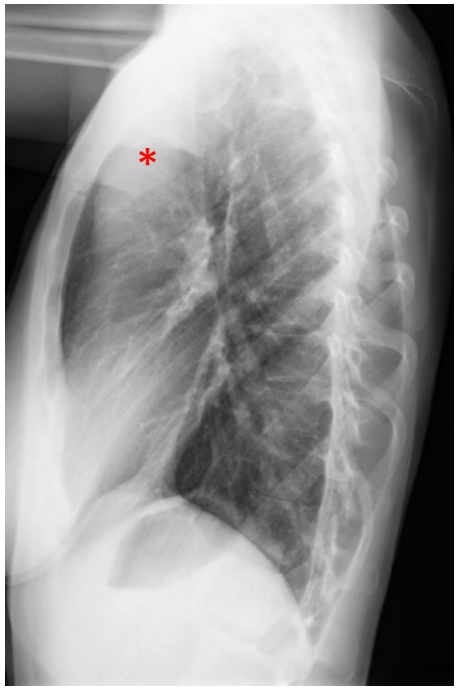
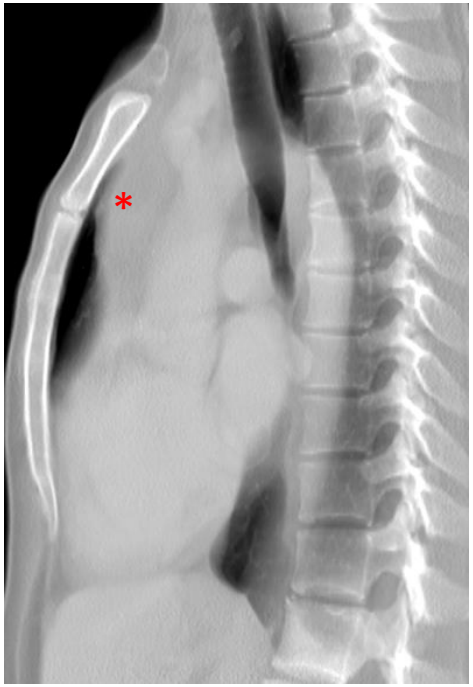
Pathology



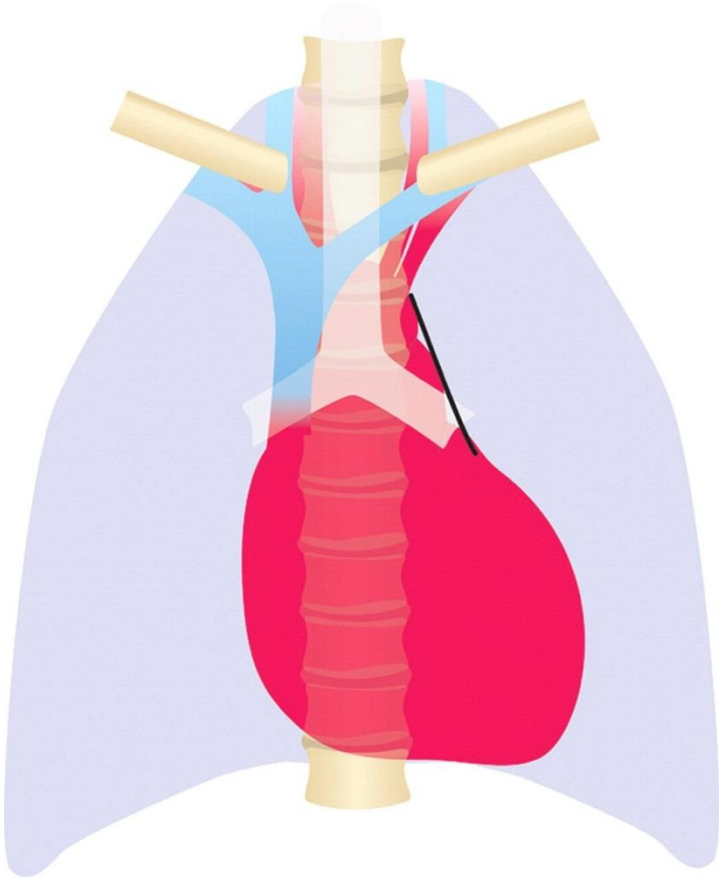
Non necrotic granuloma

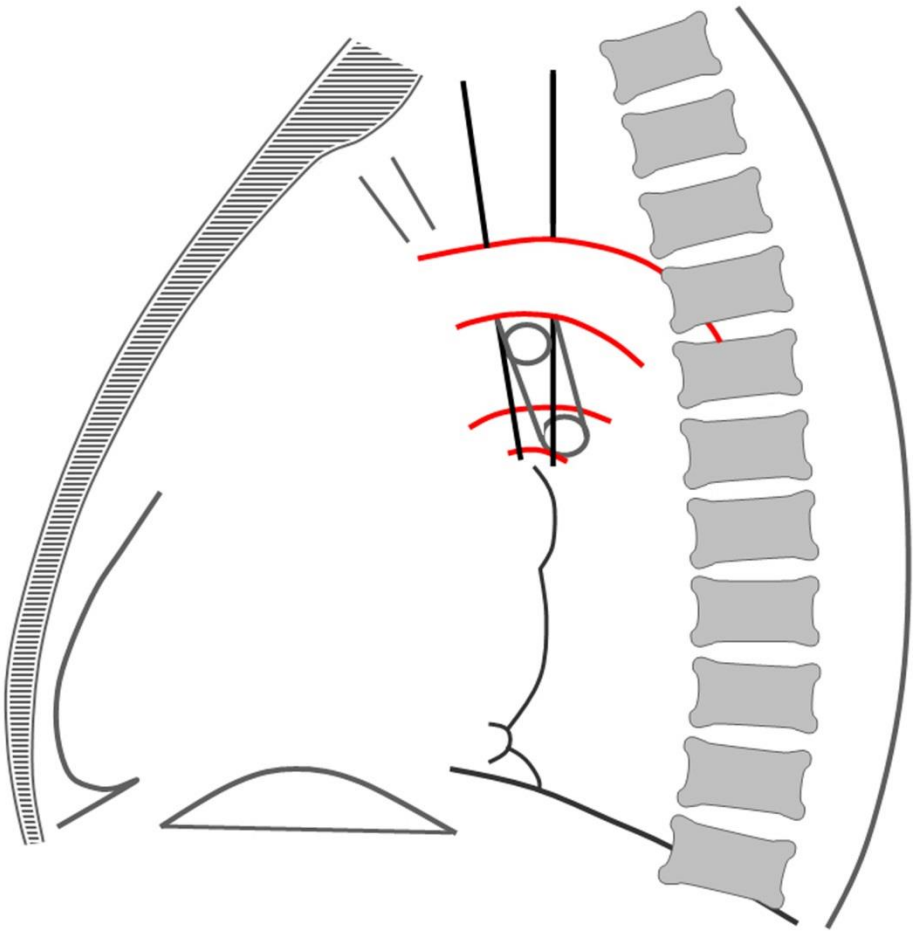
Lymphocytes



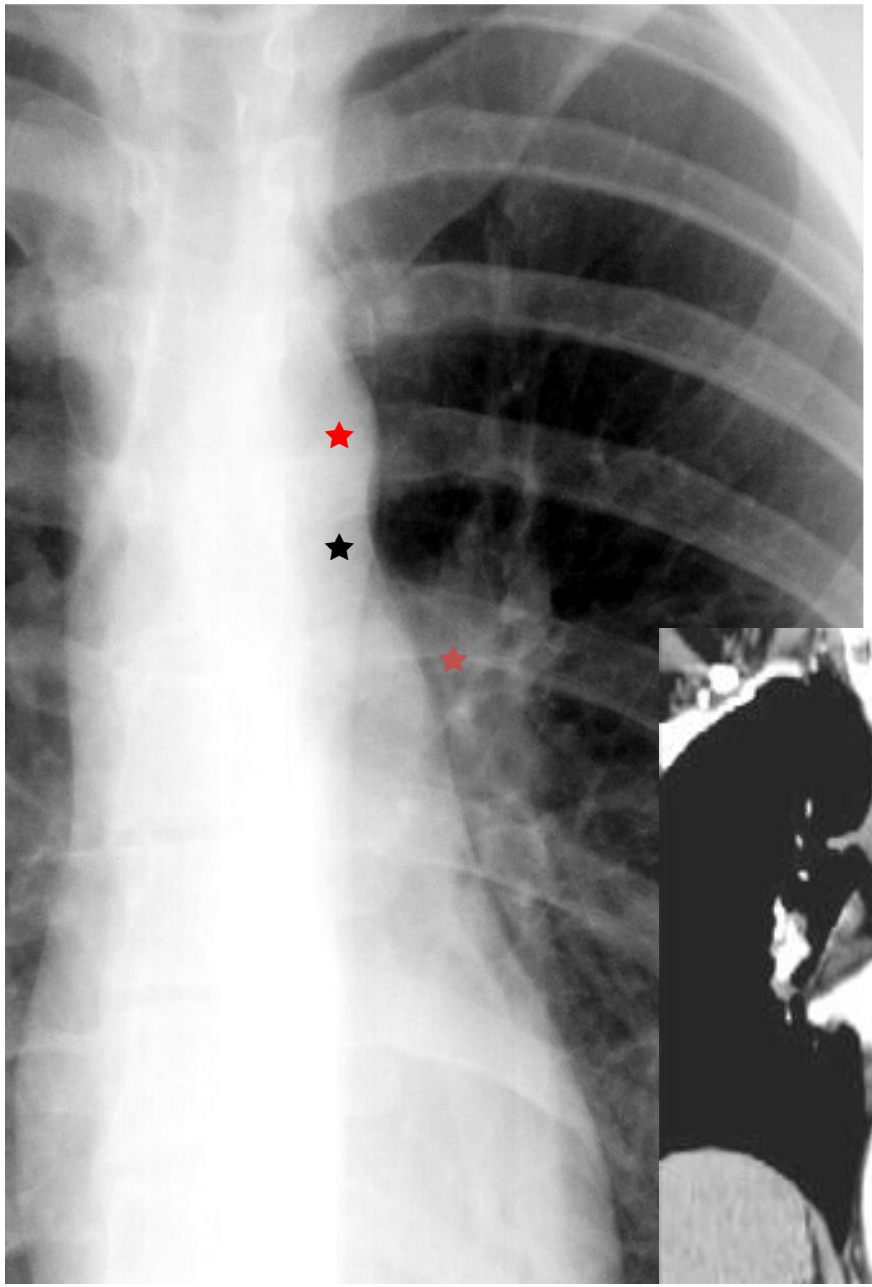

The aorto-pulmonary window and stripe

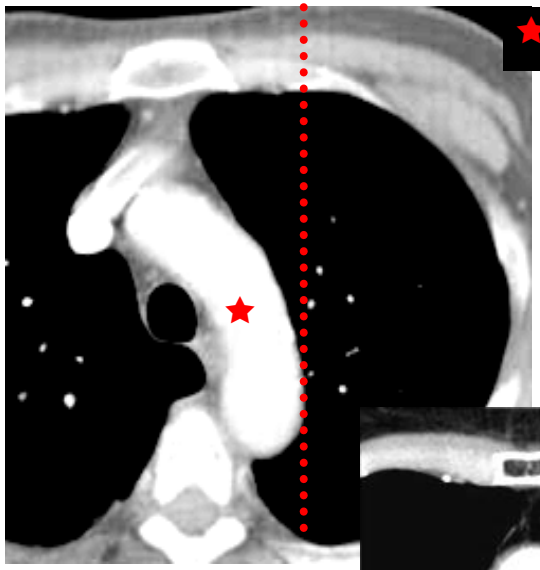




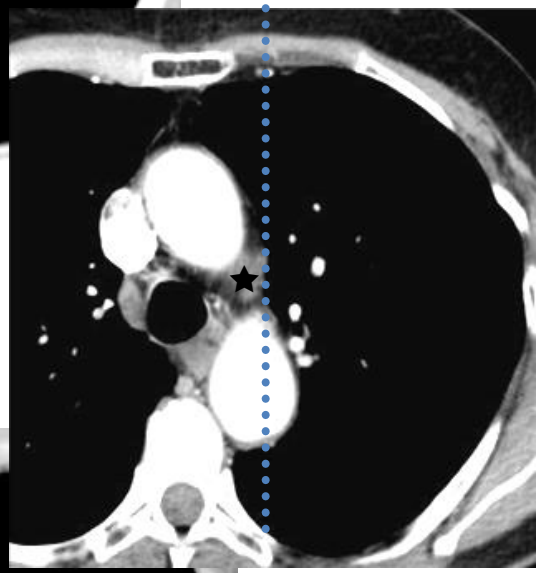
The aorto-pulmonary window

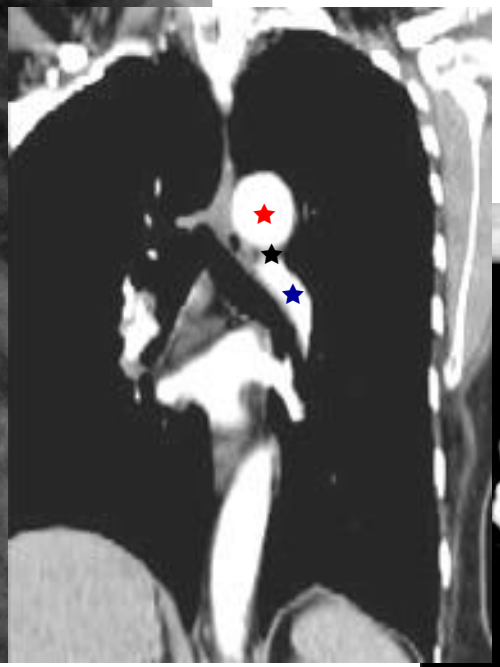
- ✓ AP window represents a mediastinal region bounded anteriorly by the ascending aorta, posteriorly by the descending aorta, superiorly by the aortic arch, and inferiorly by the left pulmonary artery.
- ✓ The medial border is formed by the ligamentum arteriosum, whereas the lateral aspect forms the interface between the left lung and the mediastinum known as the aortic-pulmonary window reflection.
- ✓ The abnormal convexity may be due to middle – mediastinum abnormalities such as lymphadenopathies, bronchial artery aneurysms, nerve sheaths tumors, broncho-pulmonary-foregut malformations, or prominent mediastinal fat.

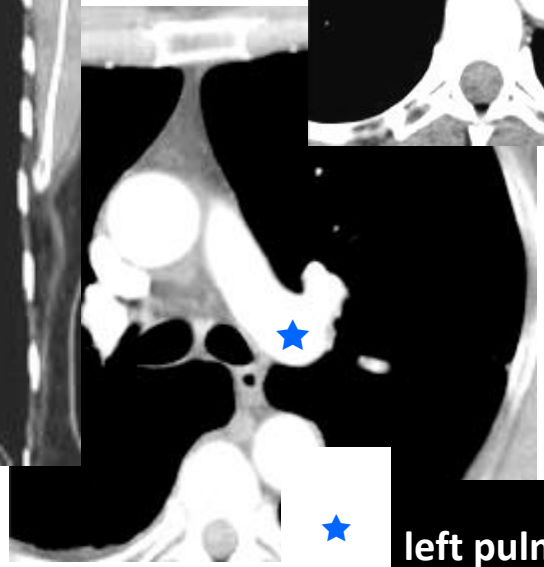




aortic arch

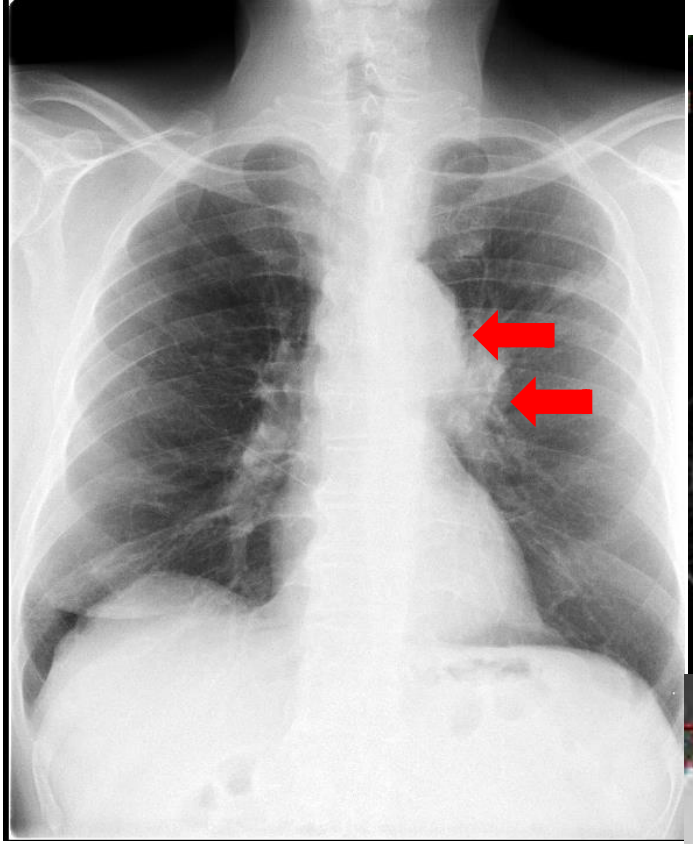


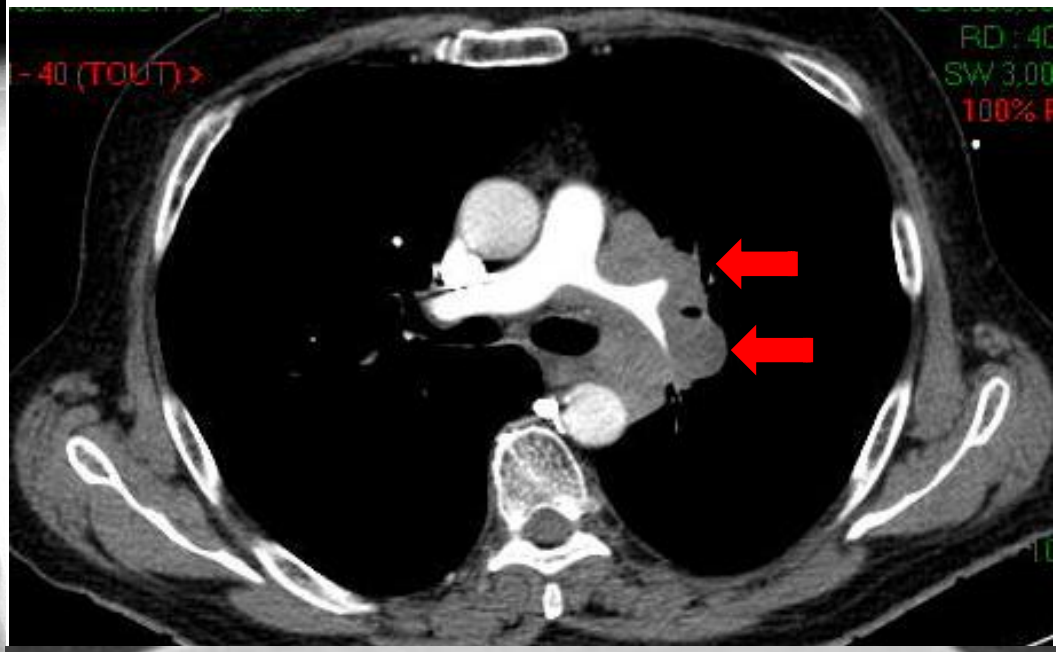




Aorto-pulmonary window

left pulmonary artery



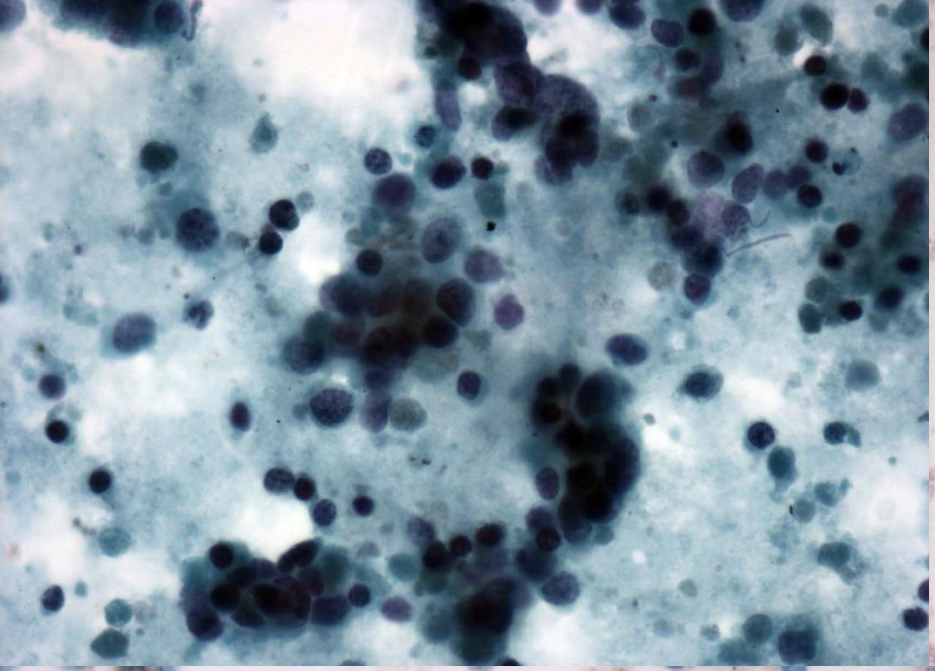


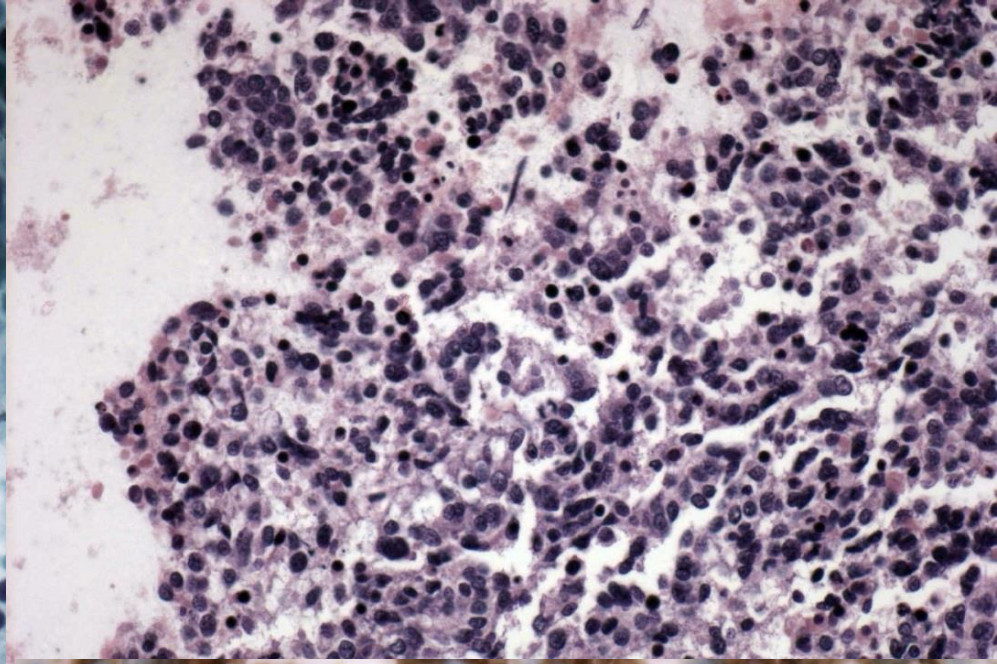
58-year old man

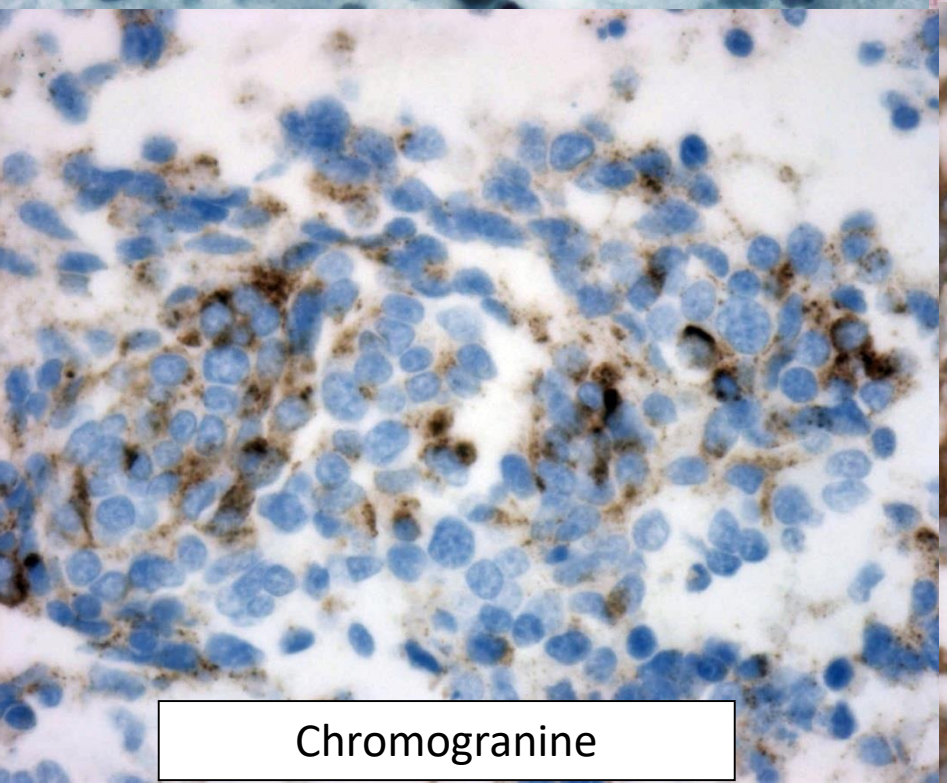
Dysphagia, cervical pain

Loss of weight: 5 kgs

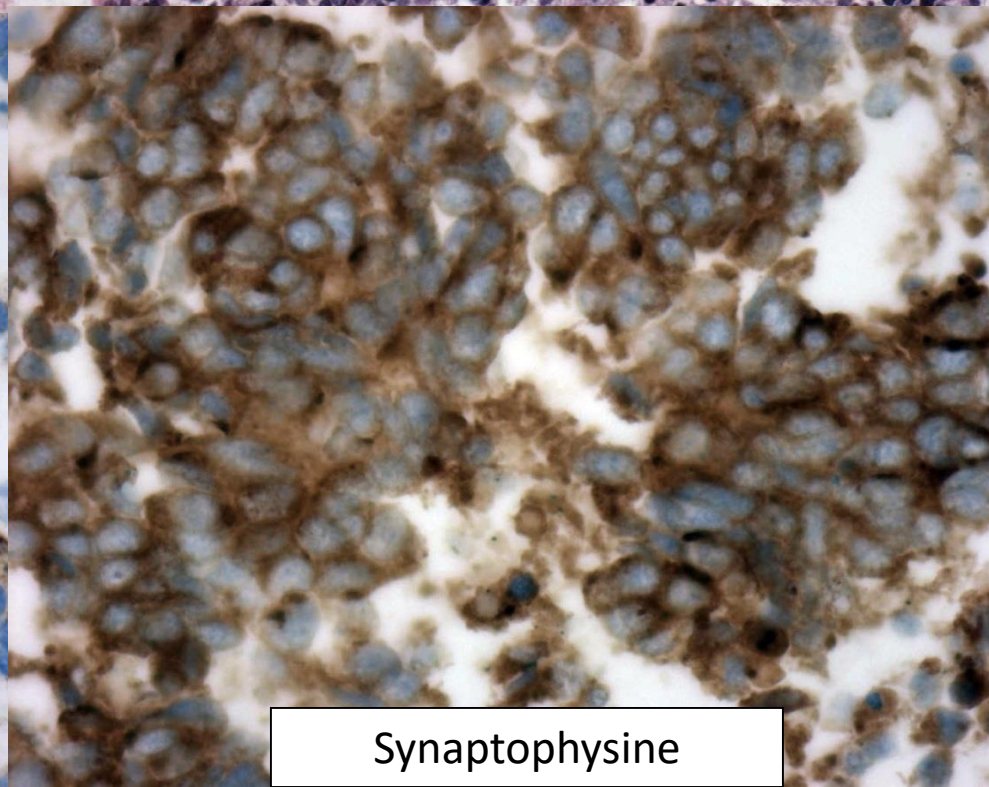
Tobacco: 40 pack years



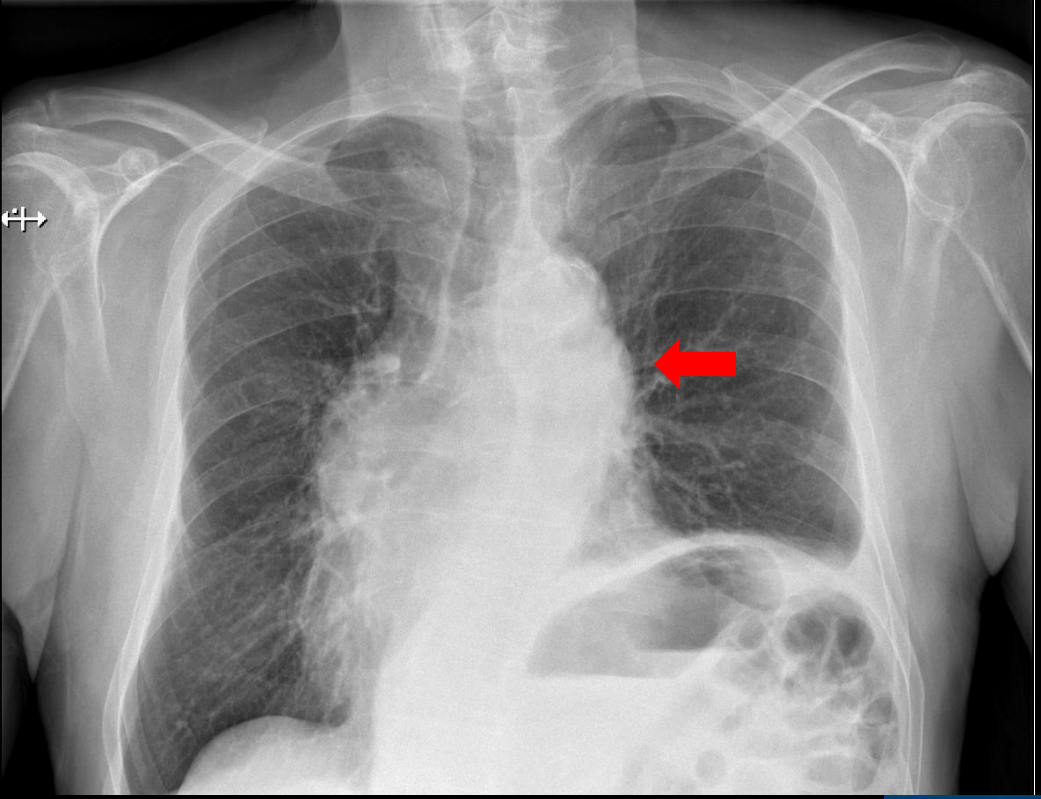


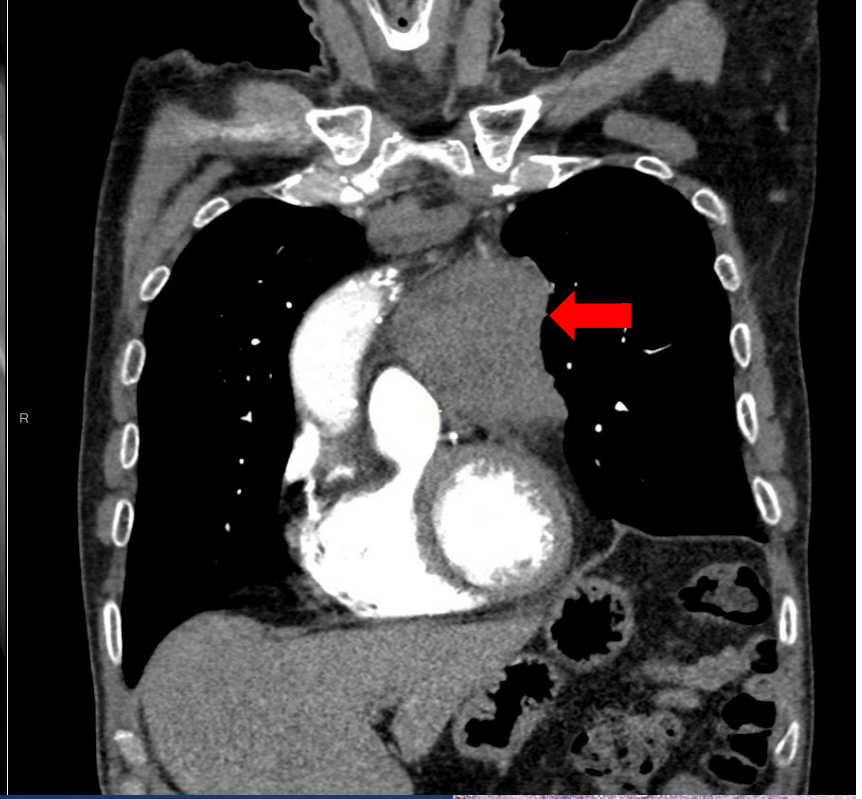


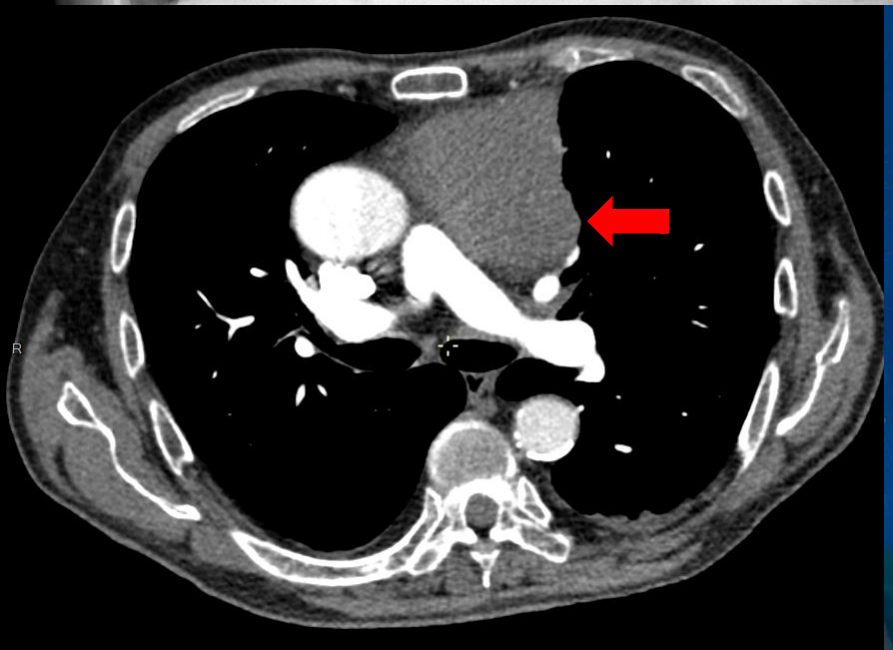
Chromogranine

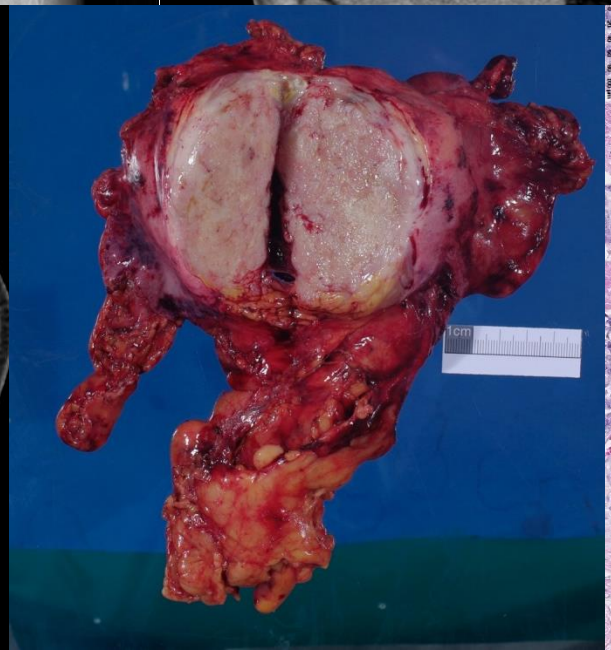


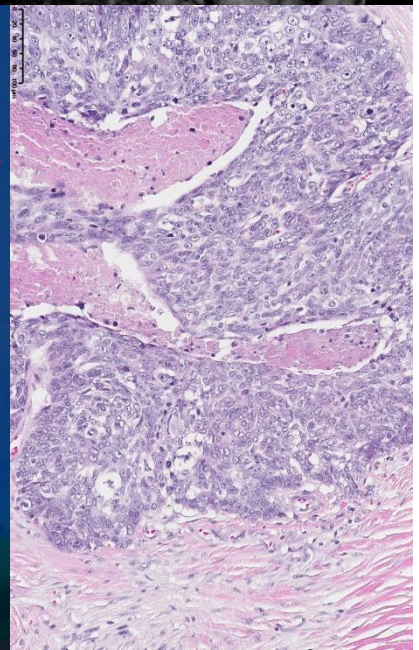
Synaptophysine



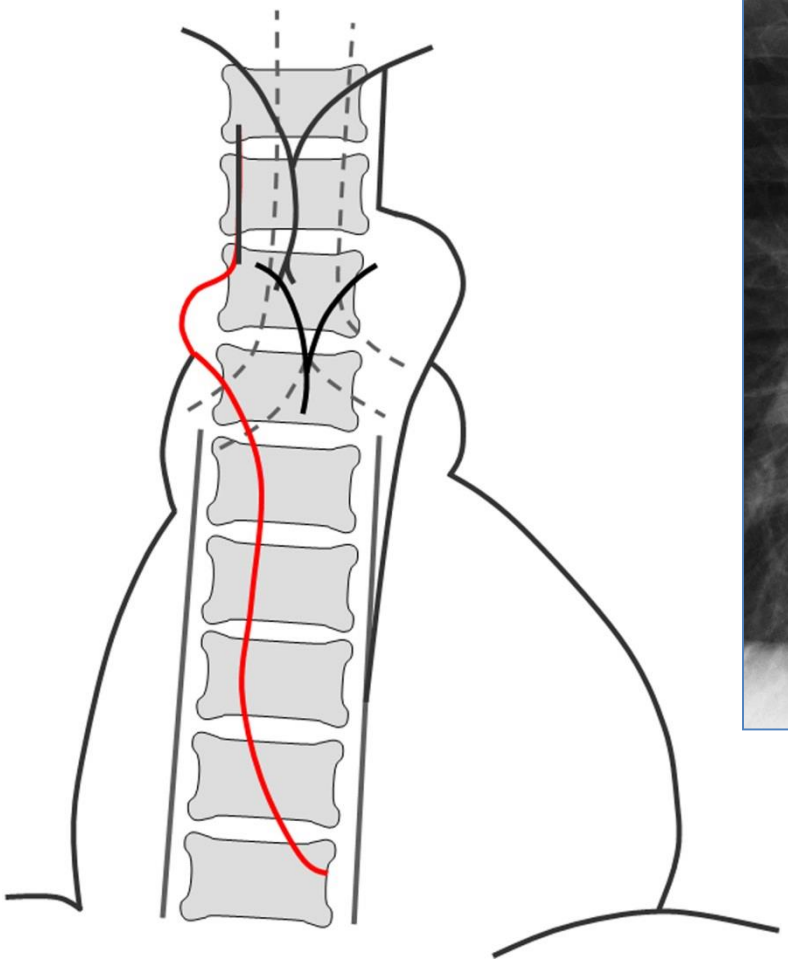


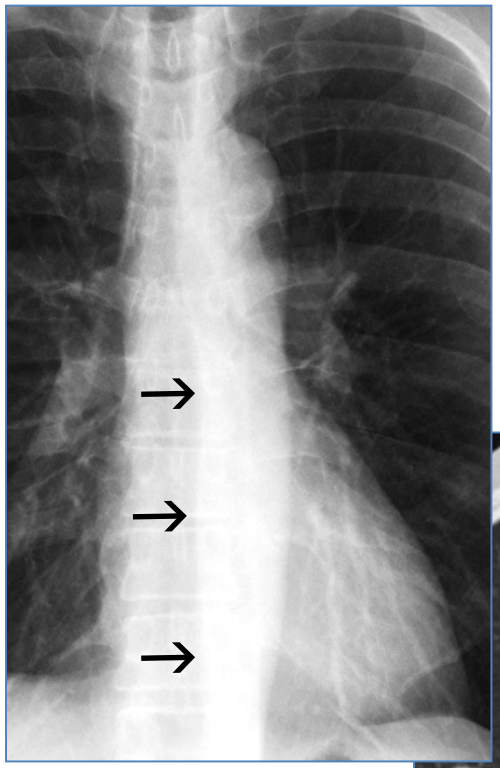



1cm

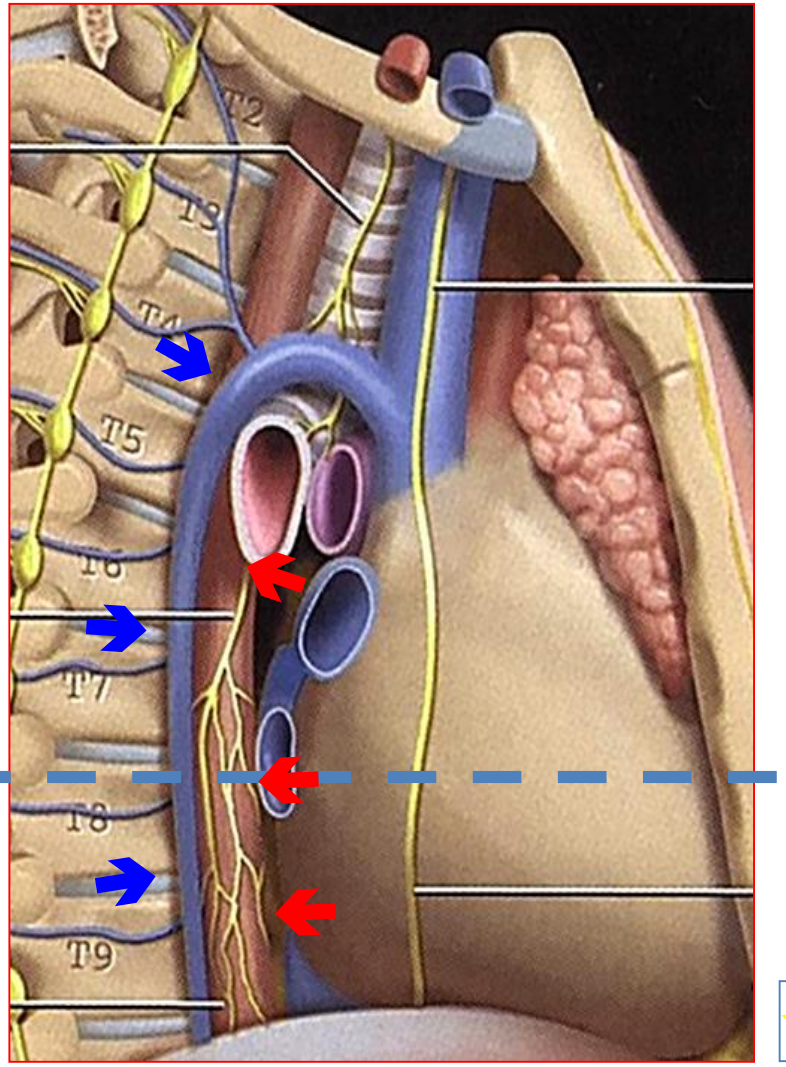


The azygo-oesophageal Line

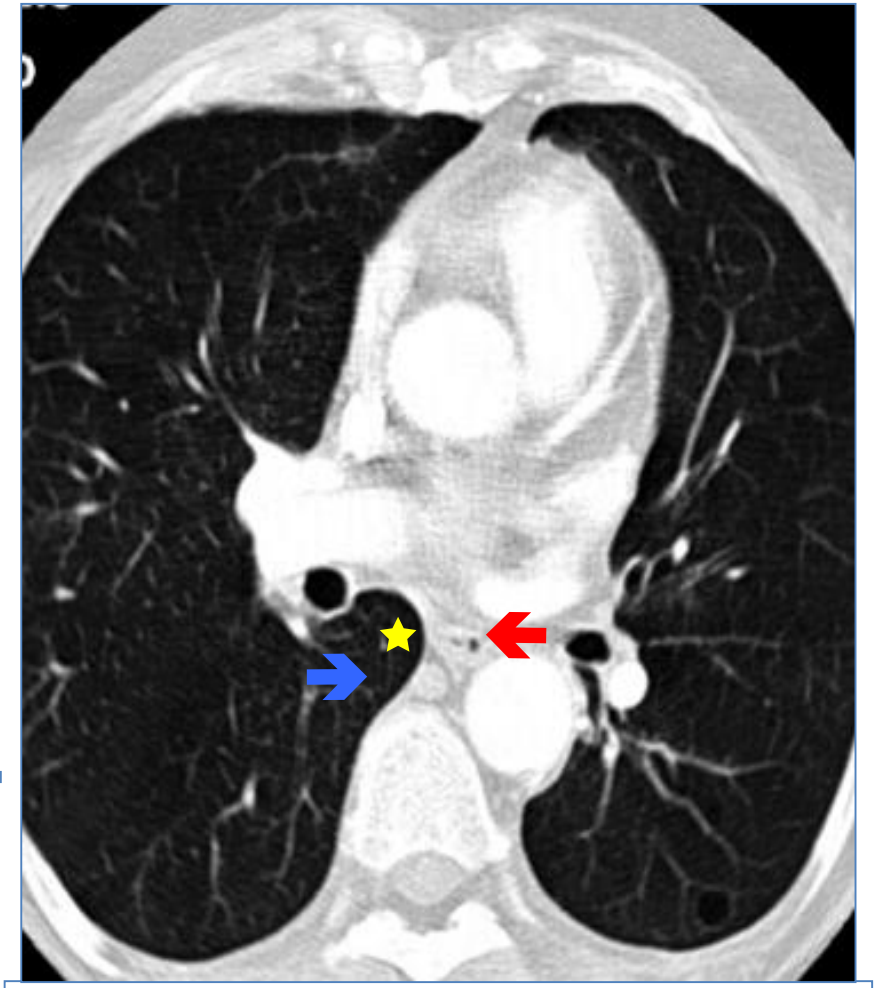




Always visible on correctly exposed radiographs



Right lateral view

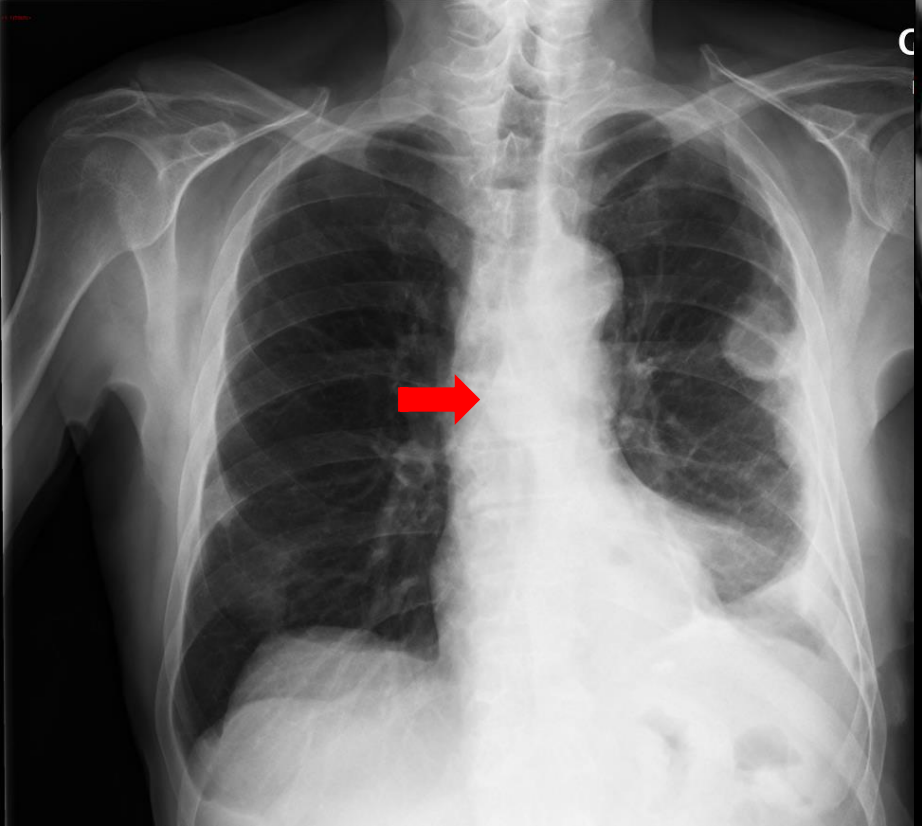


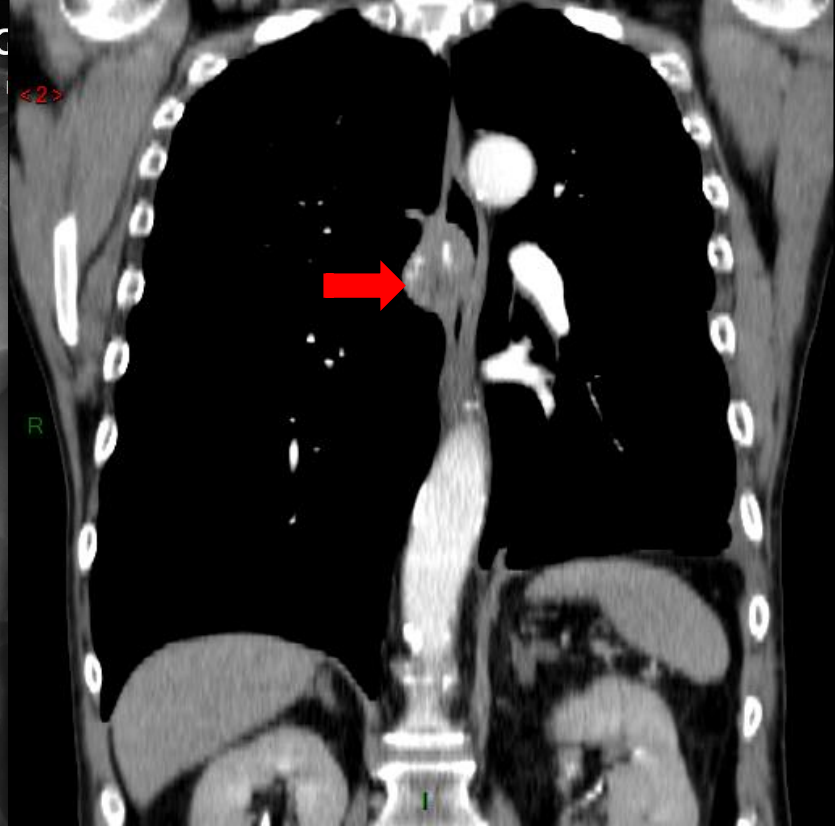
★ para-azygo-oesophageal recess

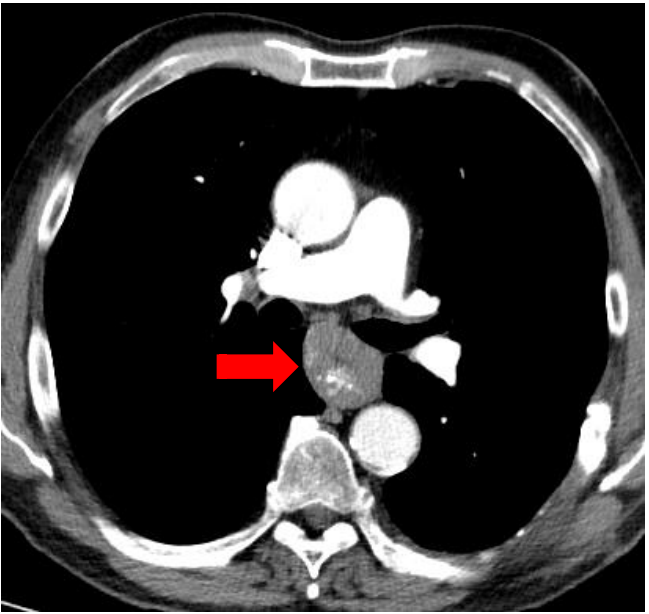
➔ Azygos vein

➔ oesophagus

Abnormal contour or disappearance suggests disease affecting the middle and posterior mediastinal compartment such as lymphadenopathy, oesophageal disease and hiatal hernias, broncho-pulmonary-foregut malformations, pleural abnormalities, left atrial enlargment.







65-year old man

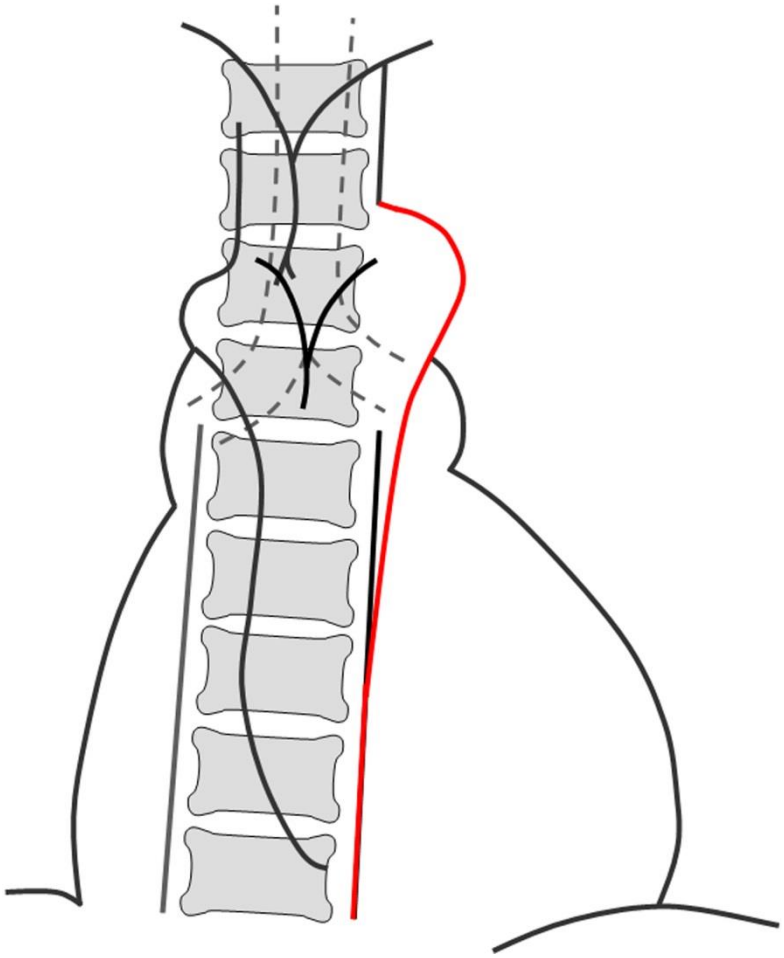
Tobacco

C2H5OH

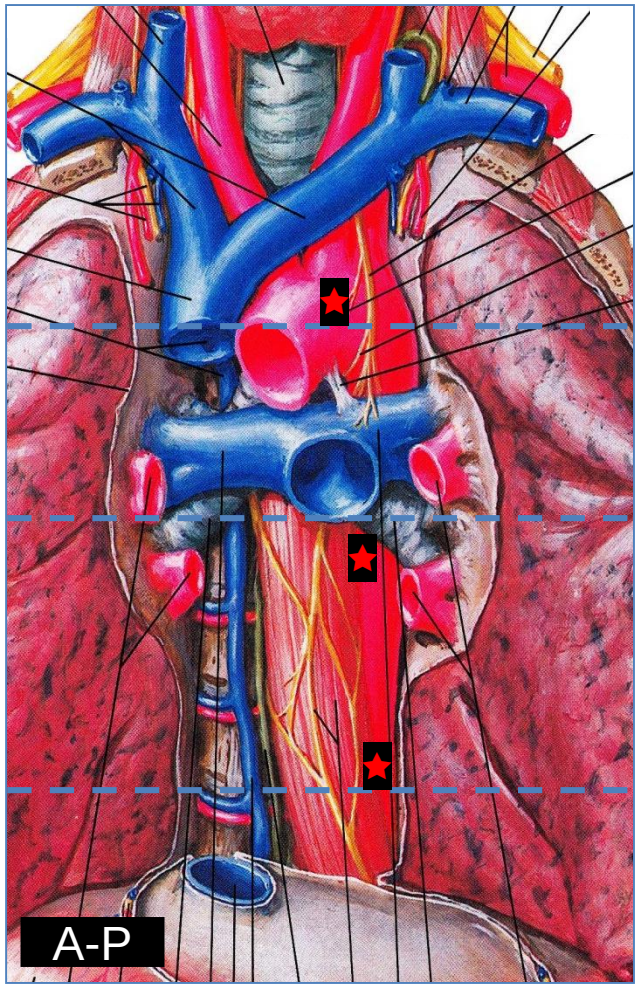
Admitted for vascular surgery ‘abdominal aneurysm)

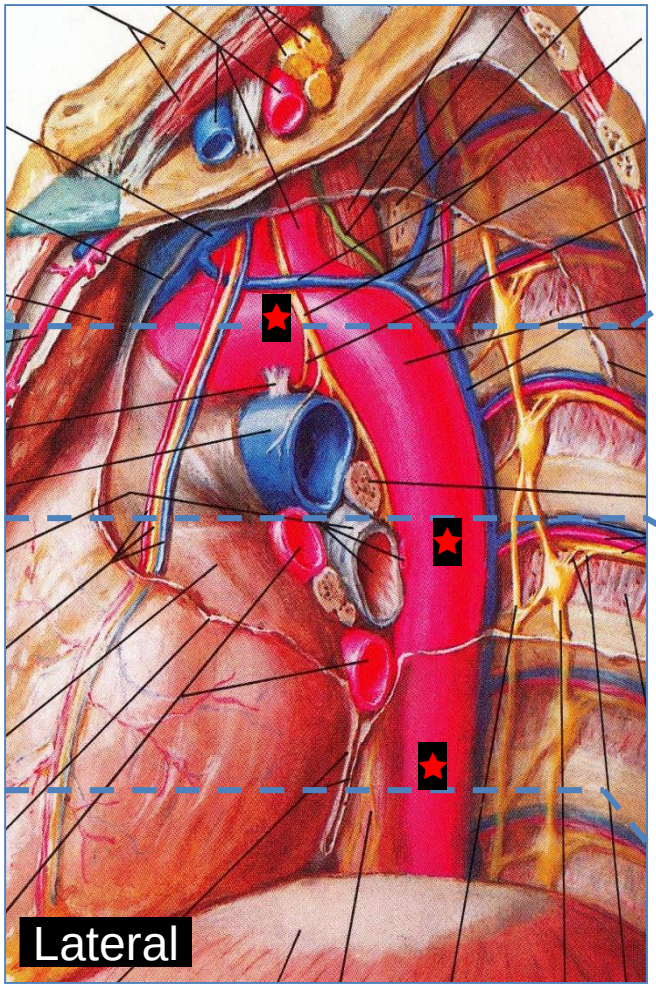
Chest X ray

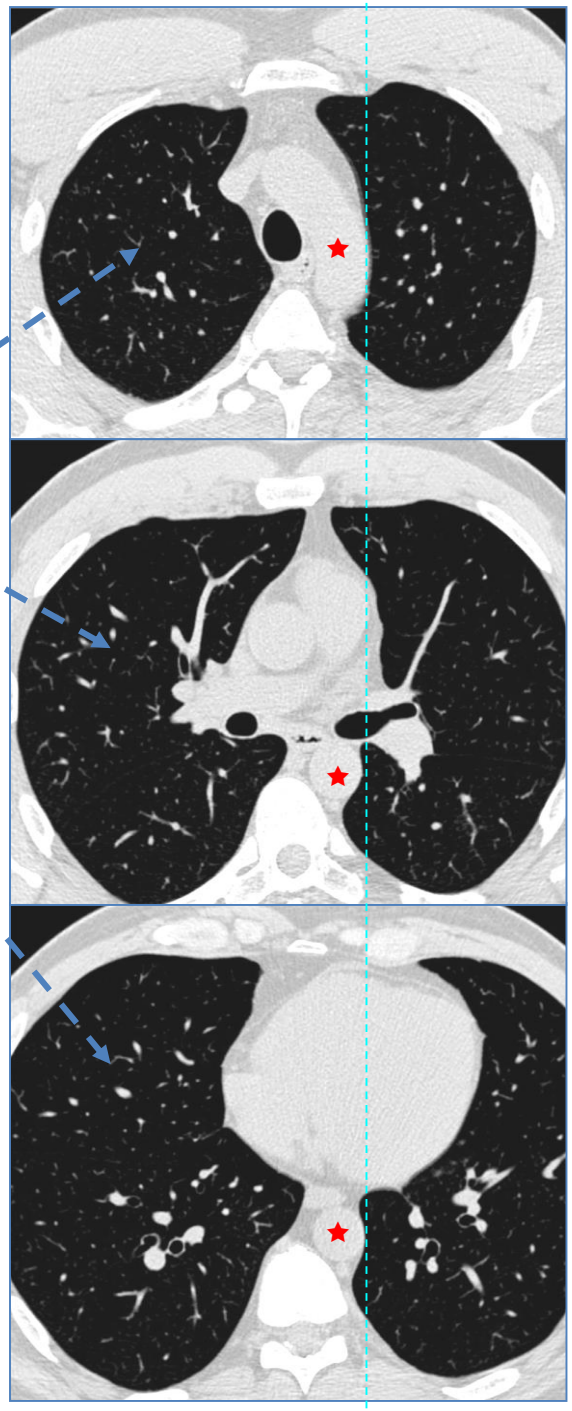
The para-aortic line



- ✓ The para-aortic line represents the interface formed by the contact of the lateral wall of descending thoracic aorta with the left lower lobe.
- ✓ The para-aortic line appears as a straight vertical interface, which lies posterior to the cardiac shadow and lateral to the left paraspinal line.







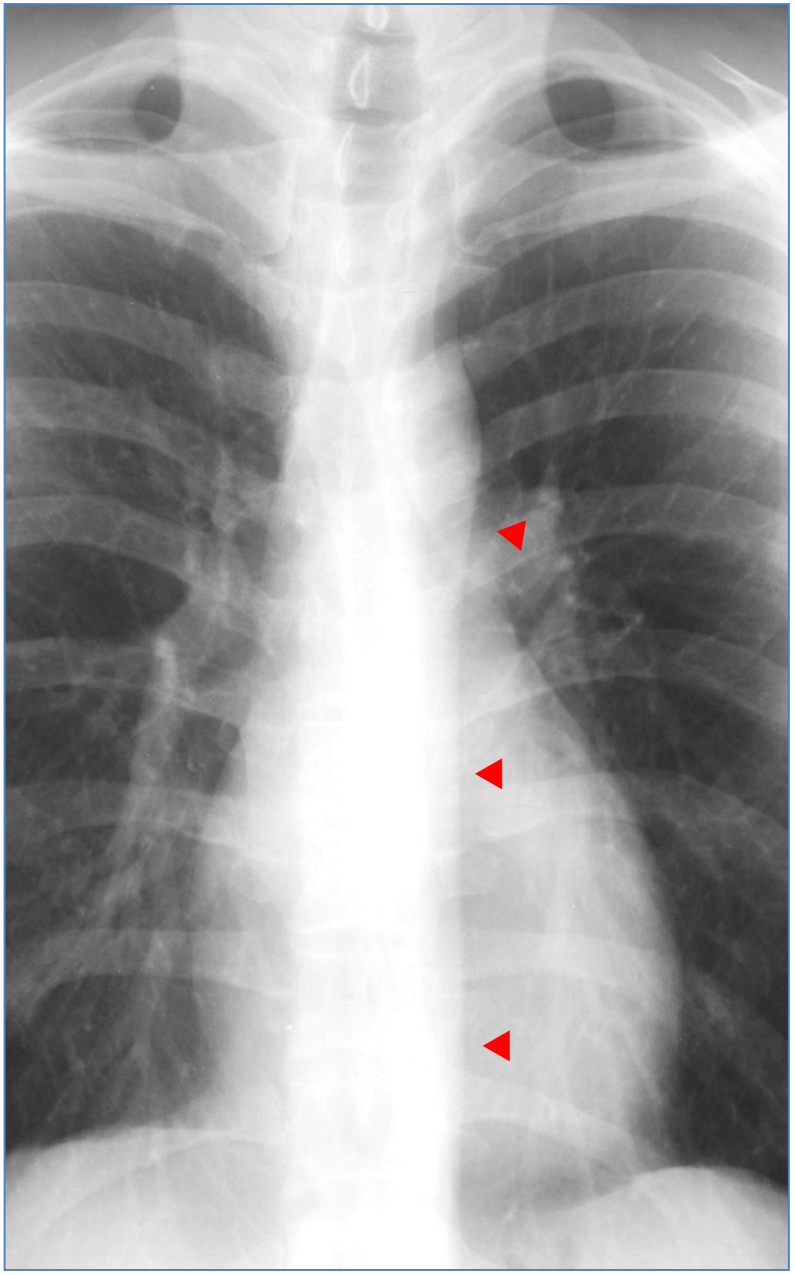
Air Interface (Lung).

Only at the lateral border

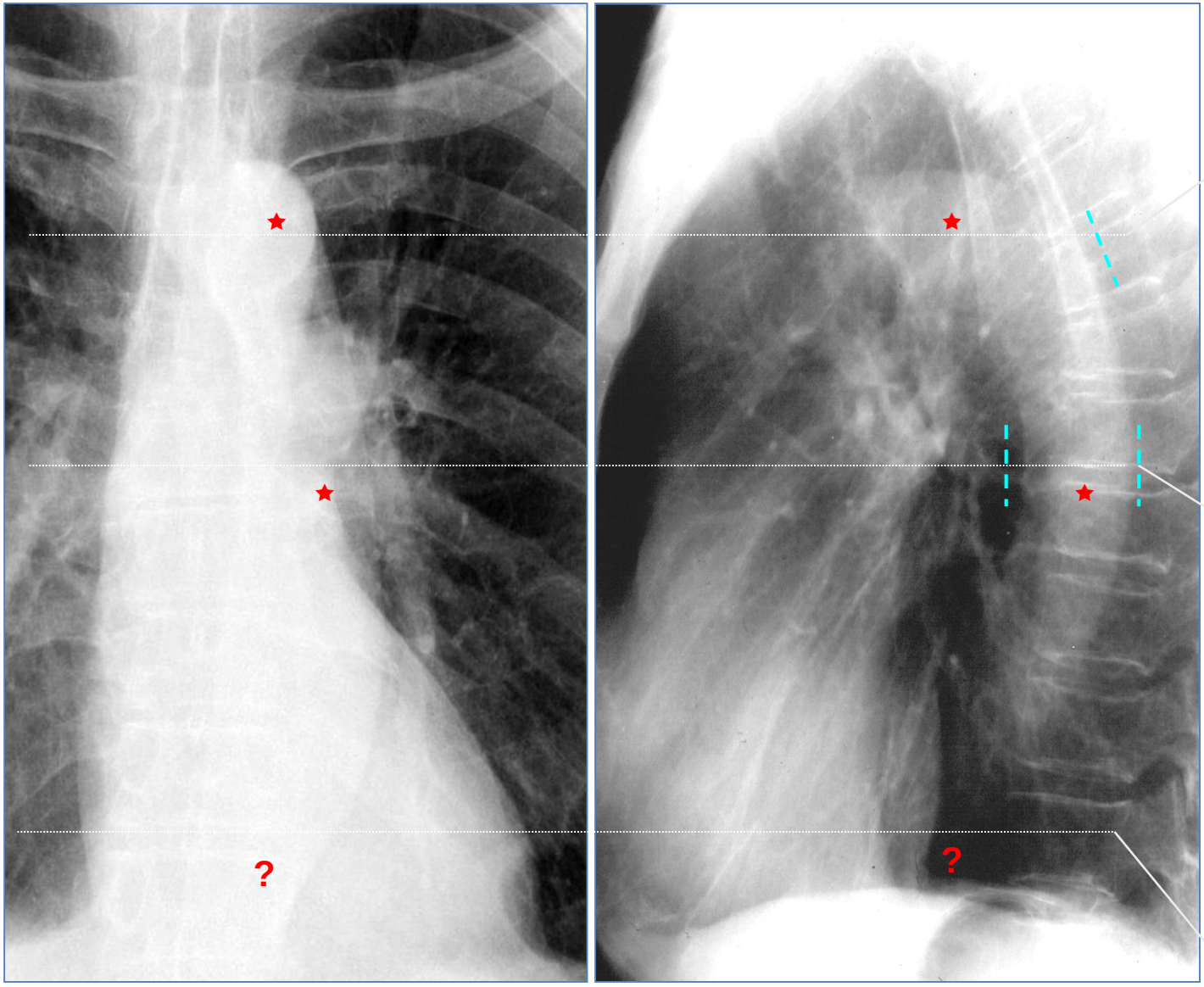
No tangency with air

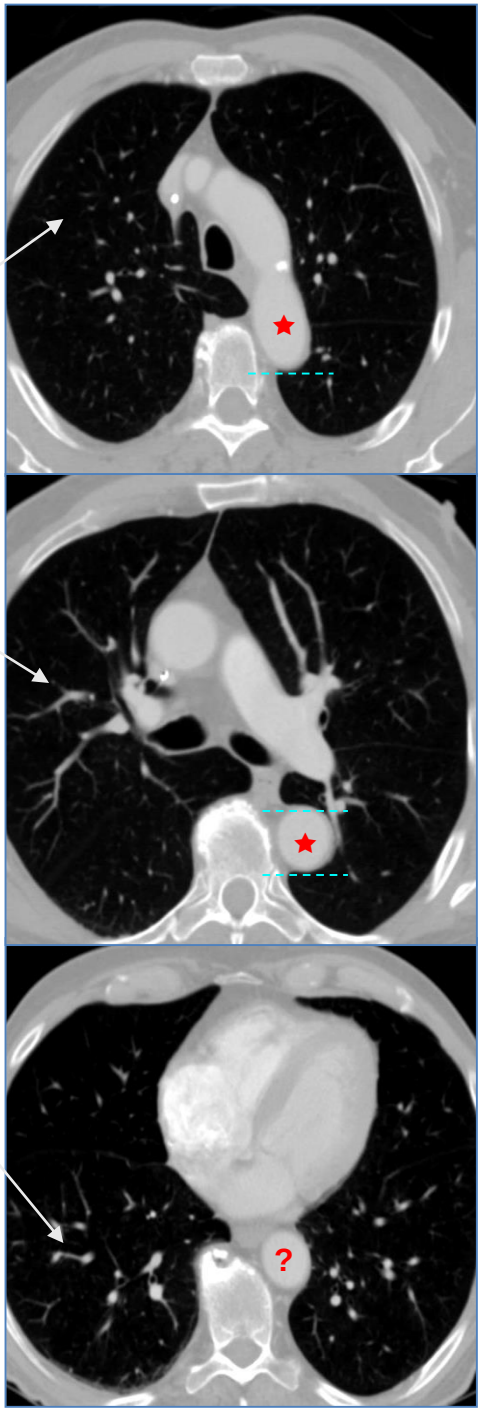
at the anterior and posterior border

★ Thoracic aorta



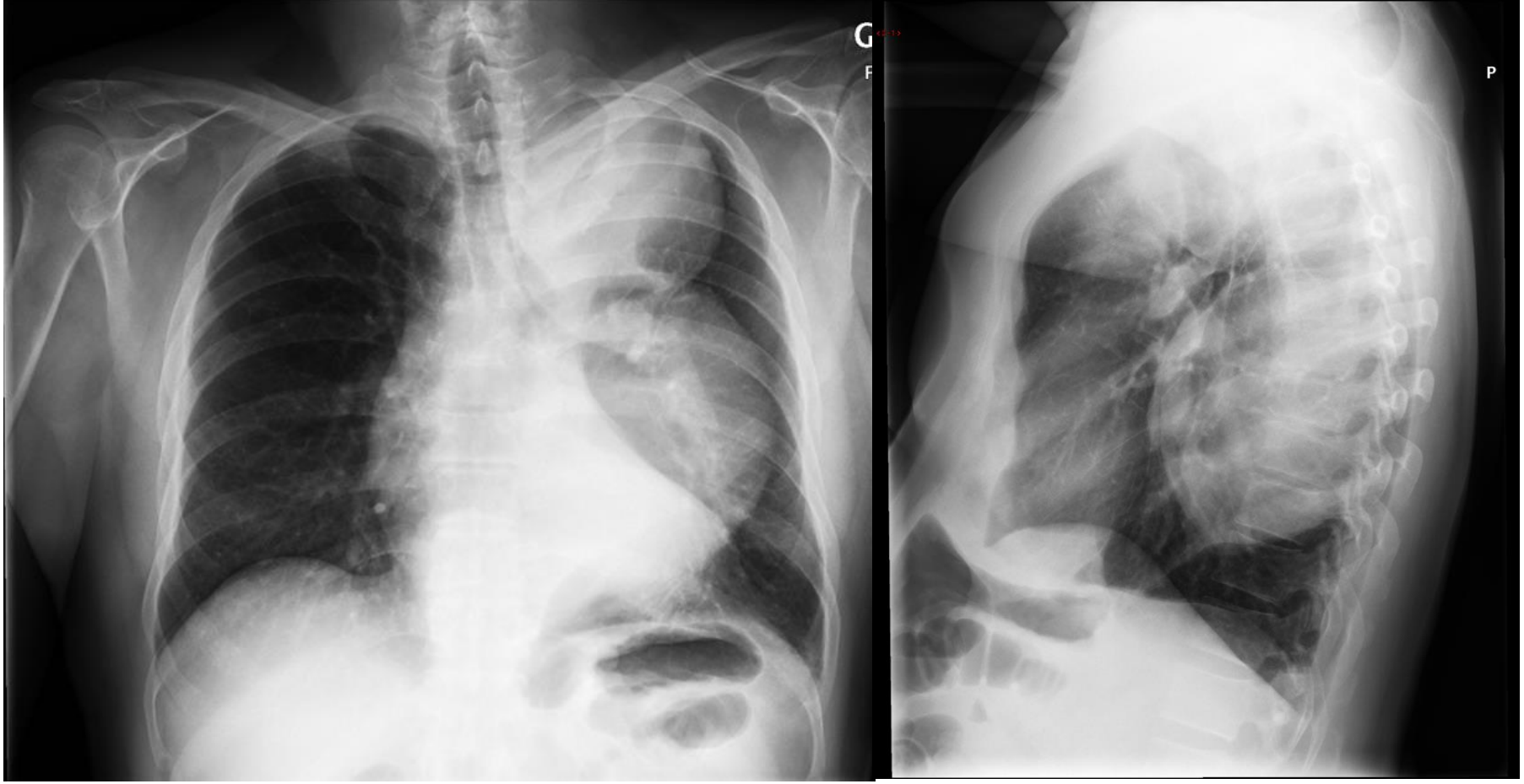
Normal descending thoracic aorta





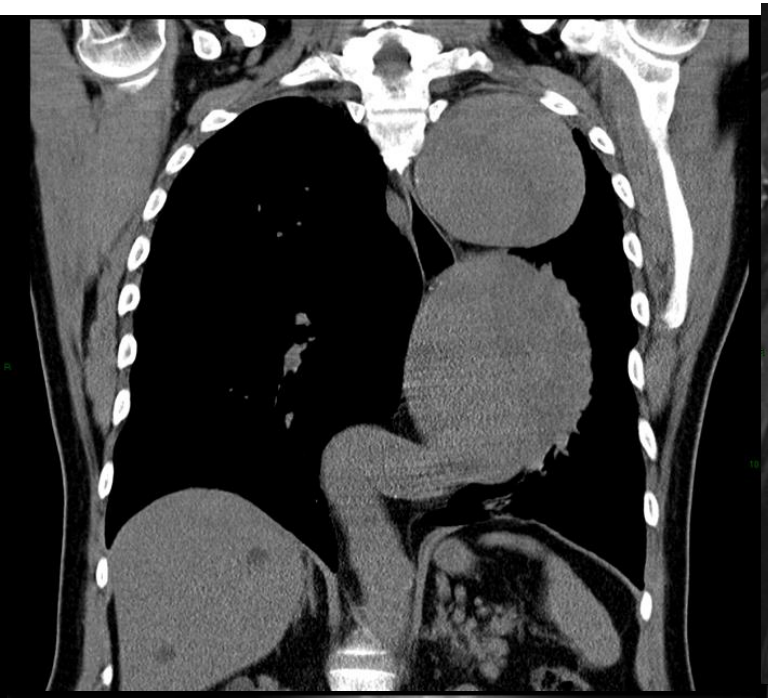
Aged man

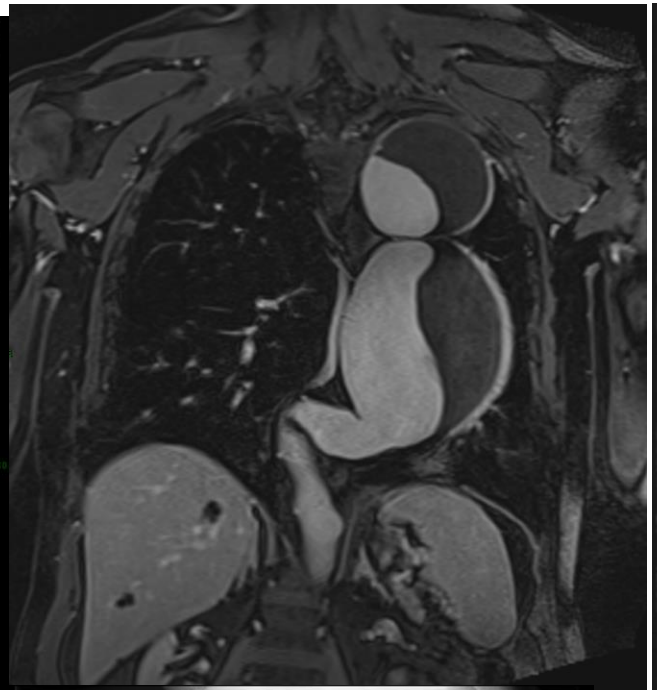
Elongated aorta

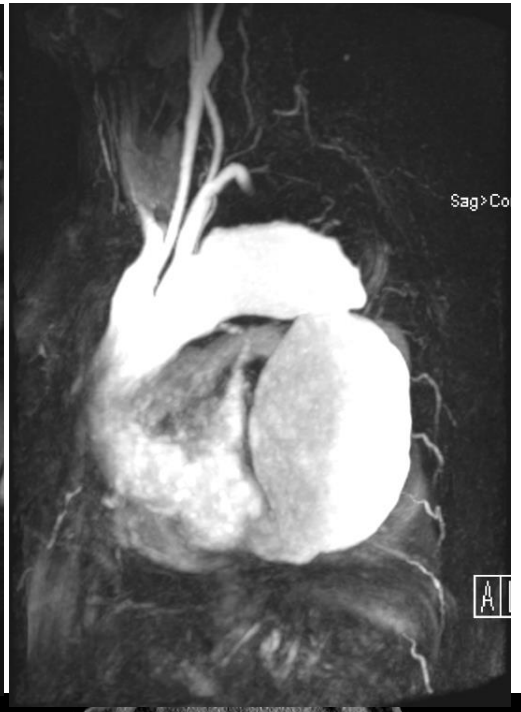


62-year old man, Vague thoracic pain, No blood sample abnormalities

An abnormal contour may be the result of different conditions affecting the lung and pleura or the middle and posterior mediastinum such as lymphadenopathy, aortic aneurysm, gastroesophageal varices and lung neoplasms



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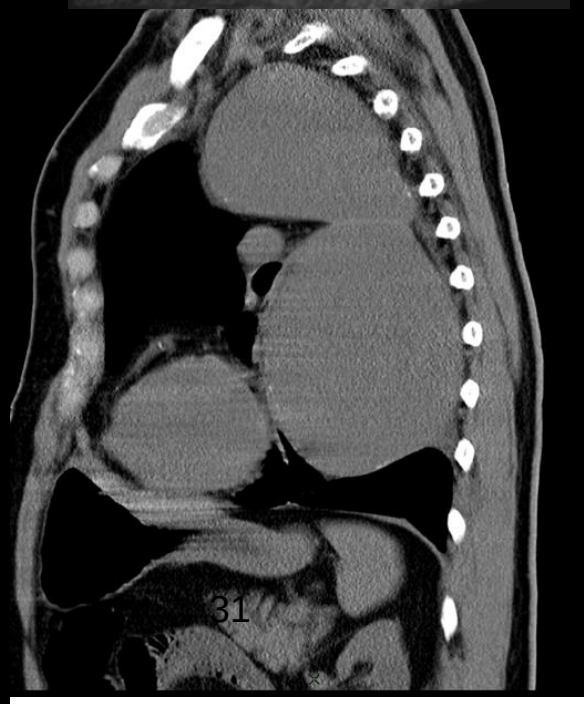

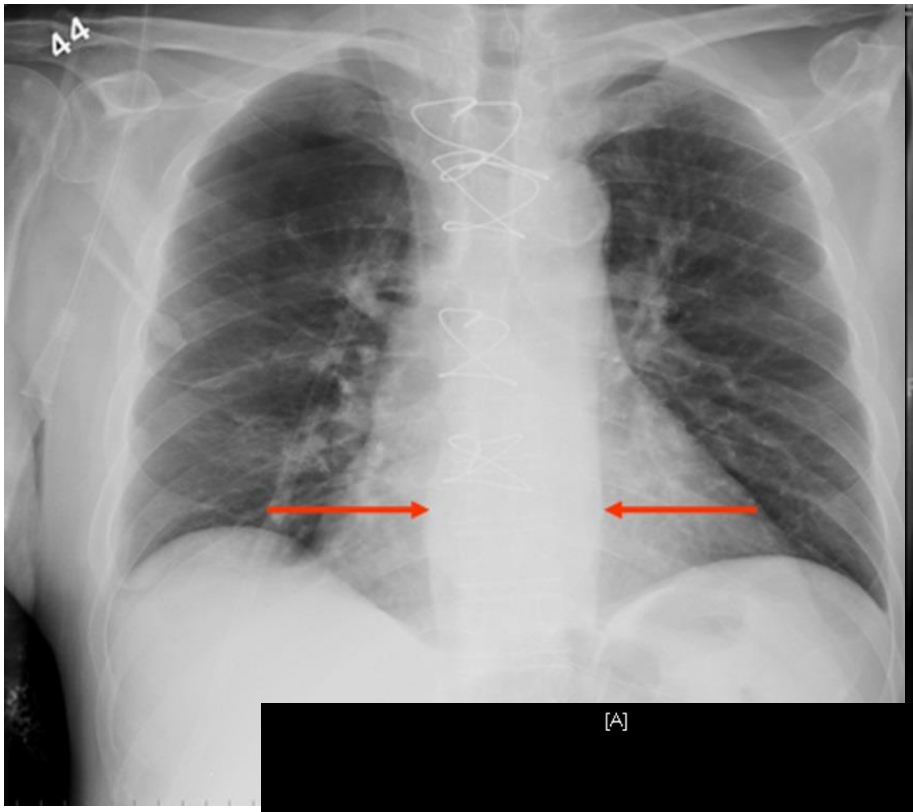
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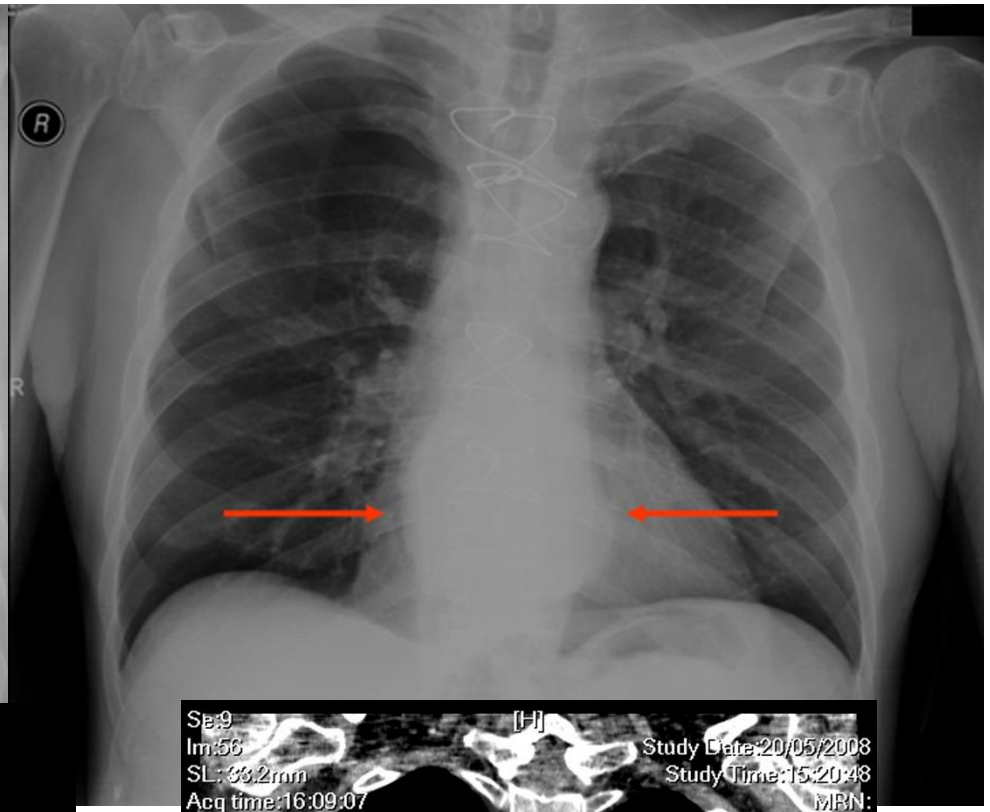
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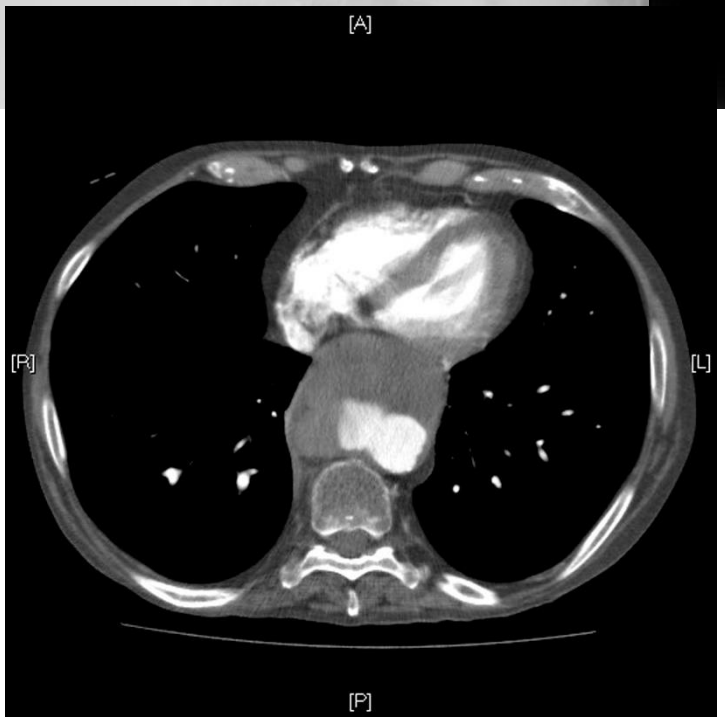
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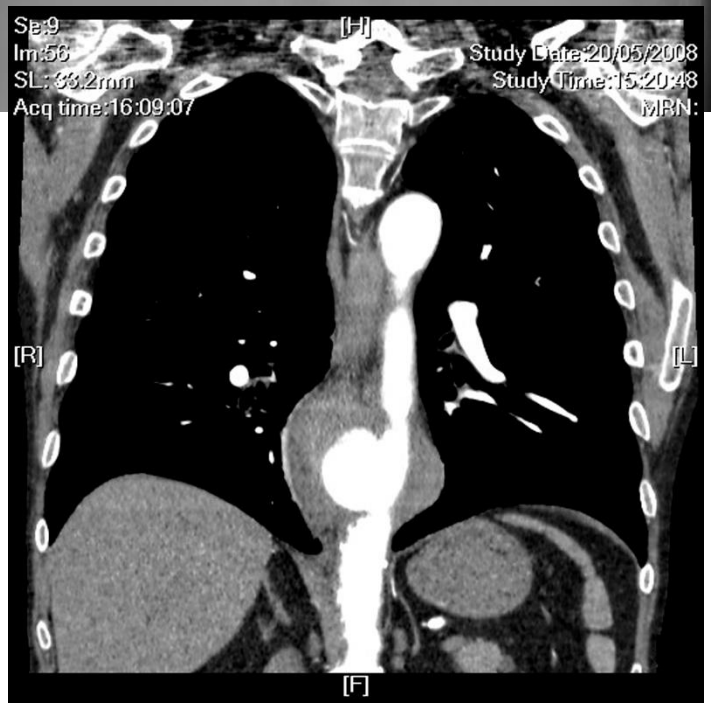
[R]
[L]
[P]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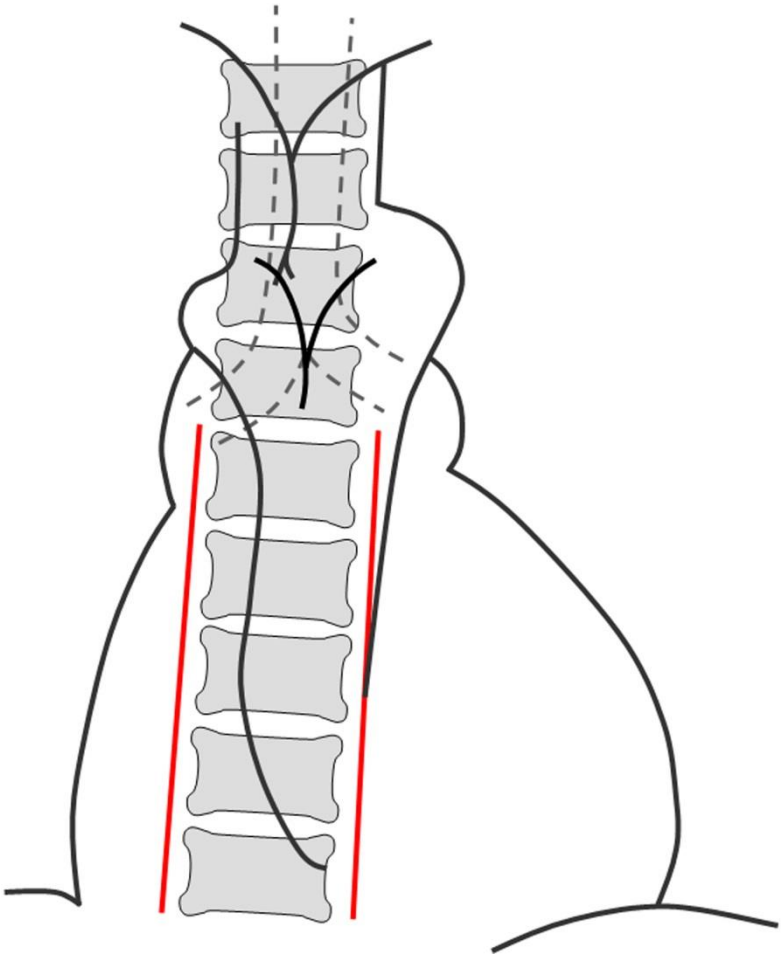
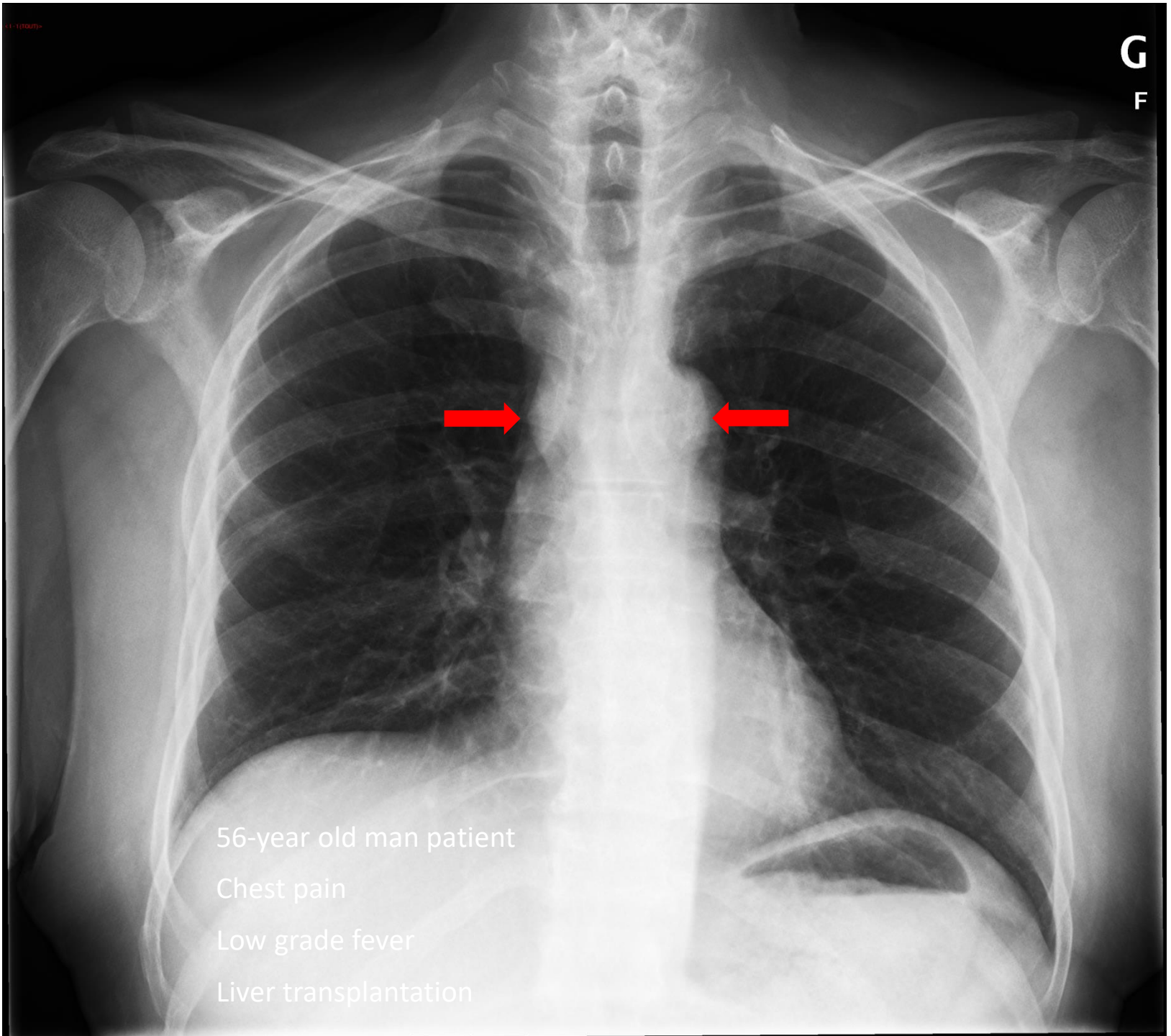
Im:56
SL:3.2mm
Acq time:16:09:07
[H]
Study Date:20/05/2008
Study Time:15:20:48
MRN:
[R]
[L]
[F]

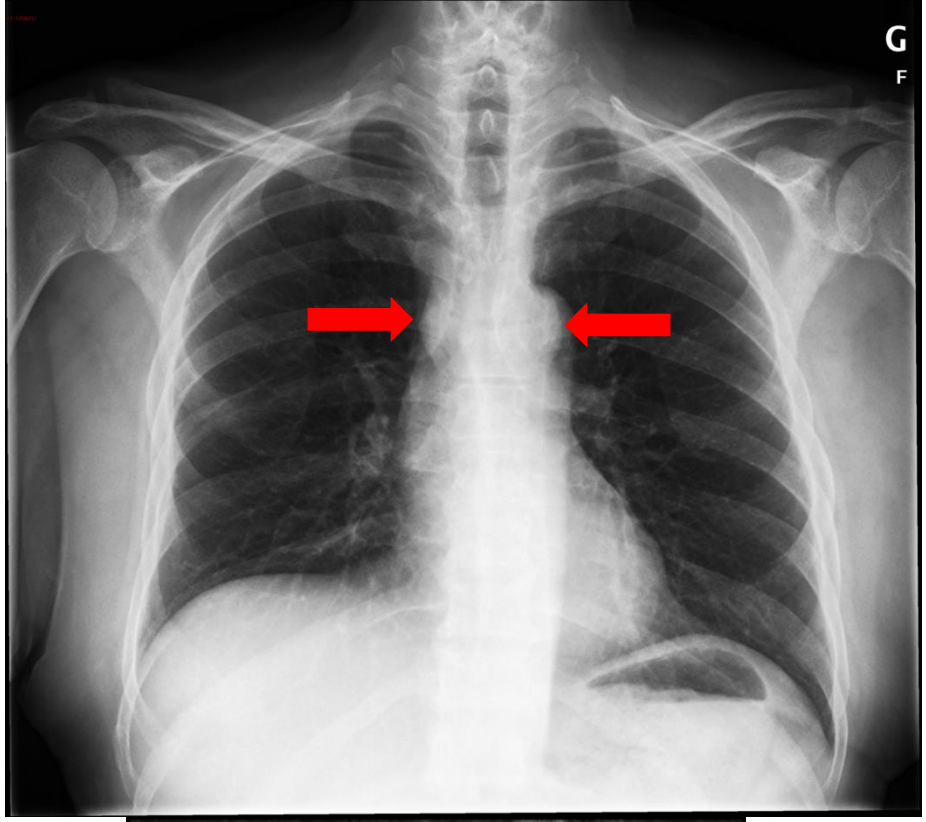
The paravertebral line



The paraspinal lines are the interfaces between the lungs and the paraspinous fat and soft tissues.

It can be displaced laterally by prominent mediastinal fat or osteophytes
Abnormal contour or displacement may also suggest posterior mediastinal disease such as mediastinal hematoma, mass or extra-medullary hematopoeisis


G
F
56-year old man patient
Chest pain
Low grade fever
Liver transplantation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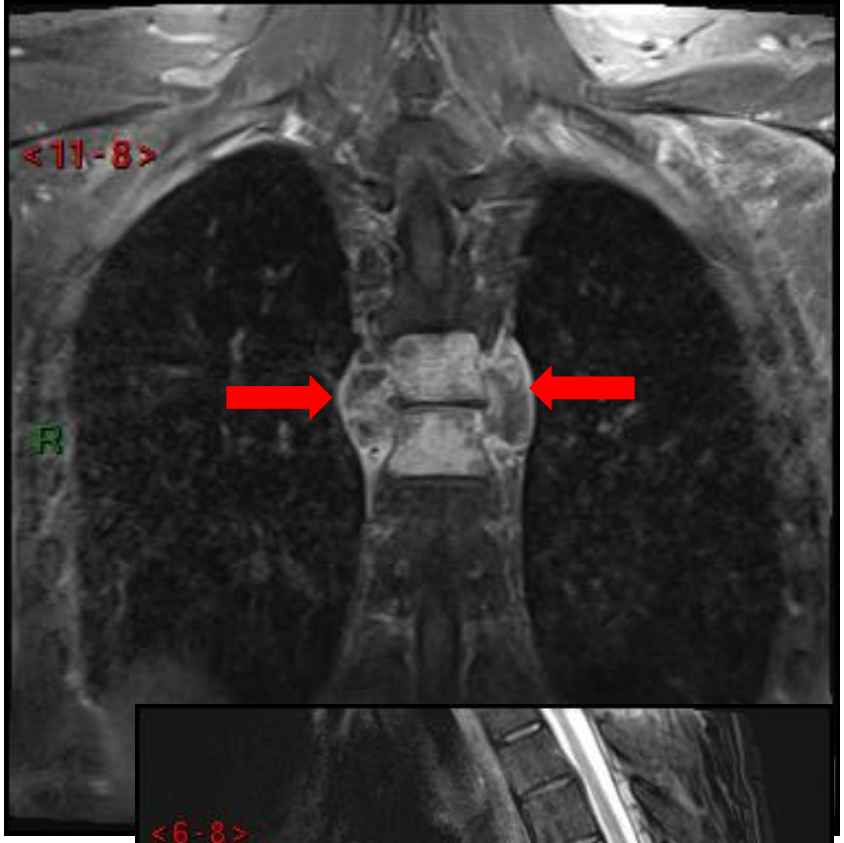
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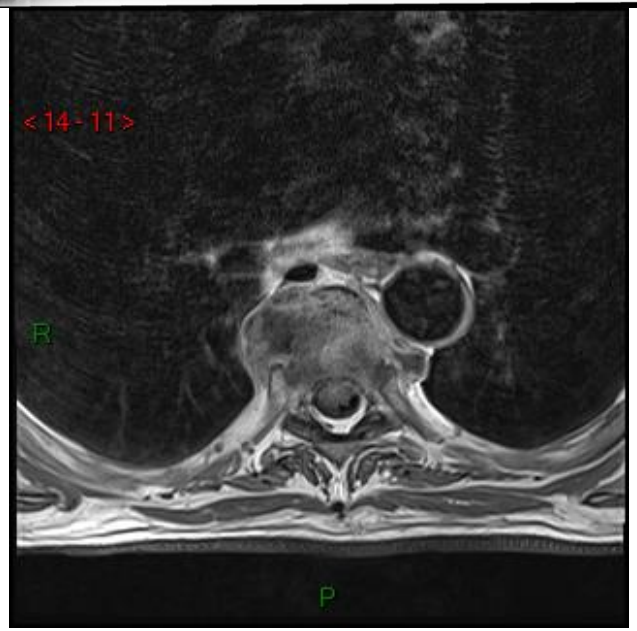
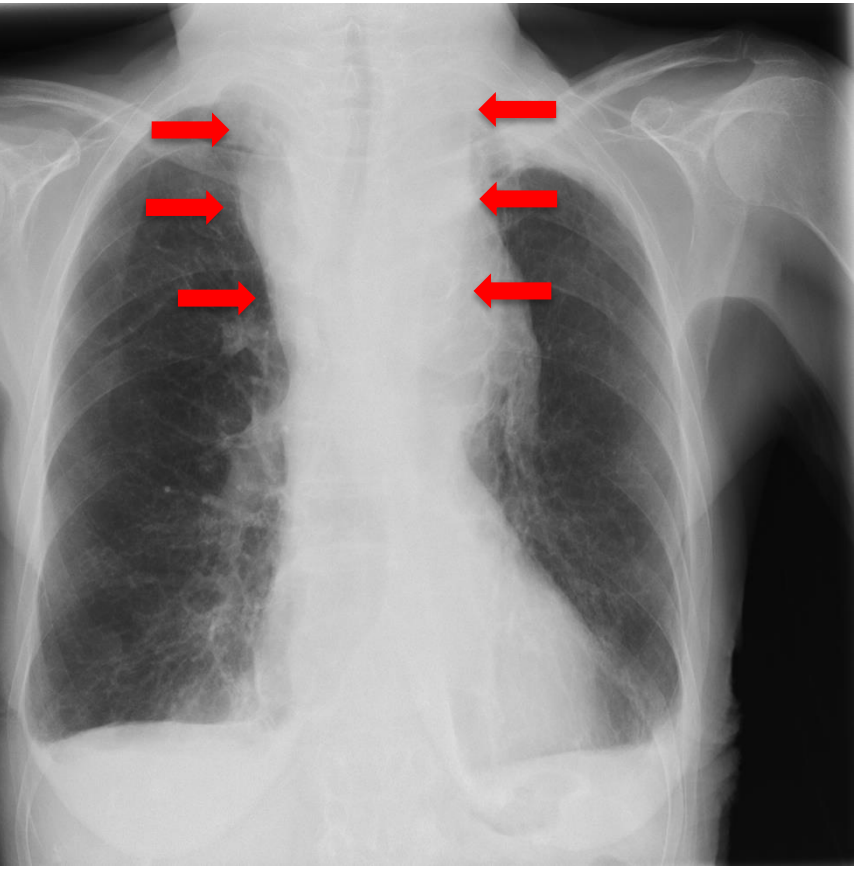
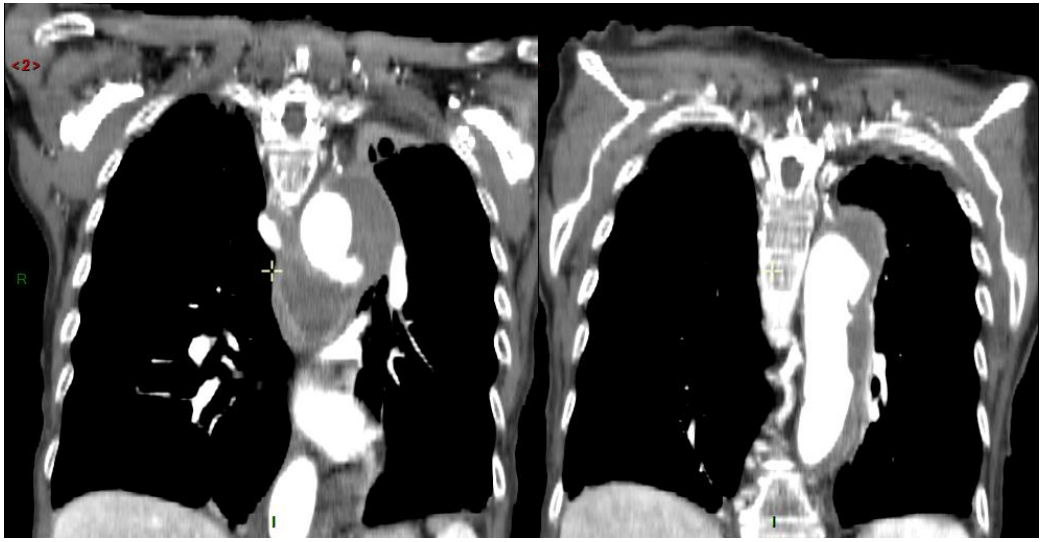

<14-11>
R
P


<6-8>
A
I

The cervico-thoracic sign

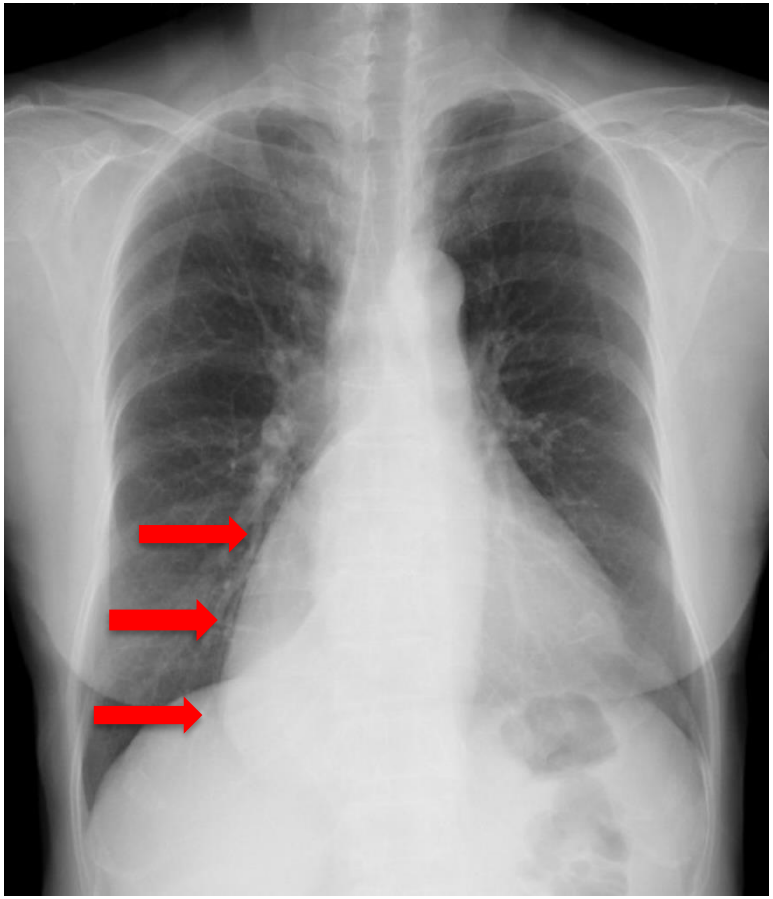
- Used to determine location of mediastinal lesion in the upper chest
- Based on the principle that an intrathoracic lesion in direct contact with soft tissues of the neck will not be outlined by air
- Uppermost border of the anterior mediastinum ends at the level of clavicles
- Mediastinal masses projected superior to the level of the clavicles bust be located either within the middle or posterior mediastinum

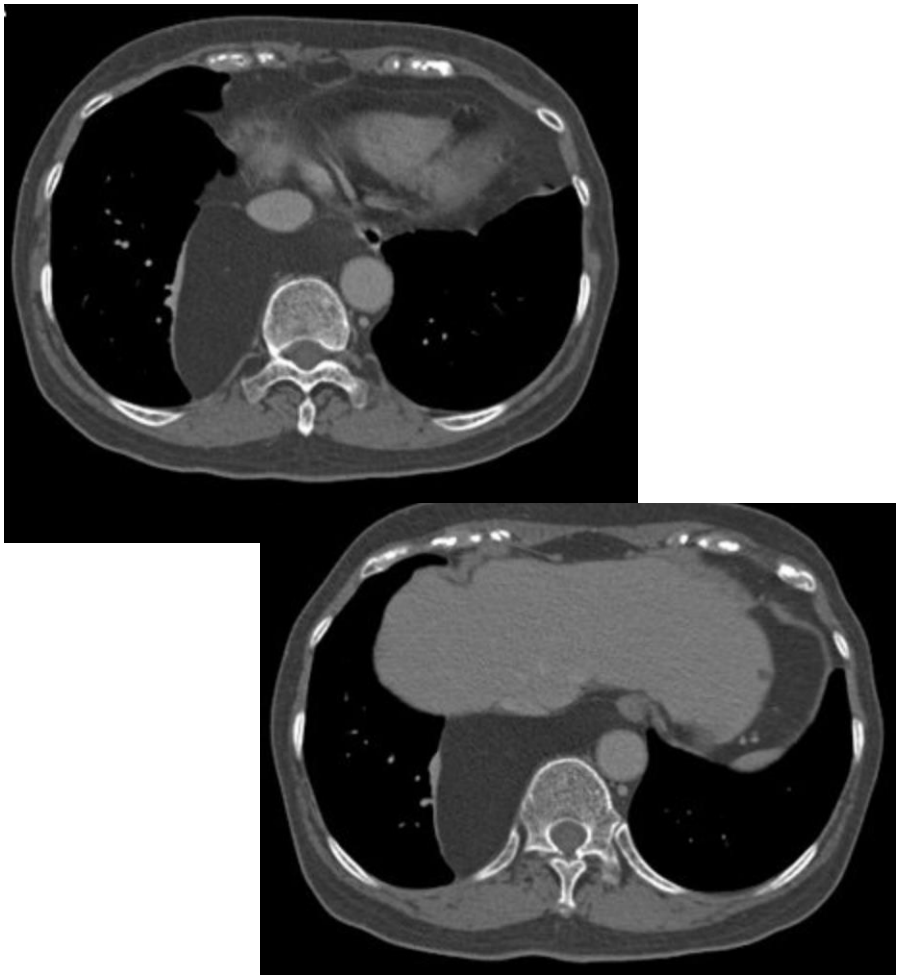




90-year old woman
Rapid swelling of the thyroid gland
Heart rate: 100 bpm
No malaise/no significant history
Chest X-ray
CT scanner

The thoraco-abdominal sign

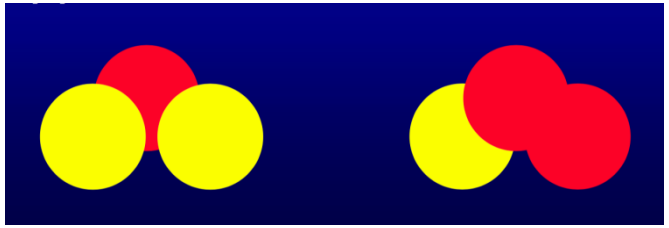


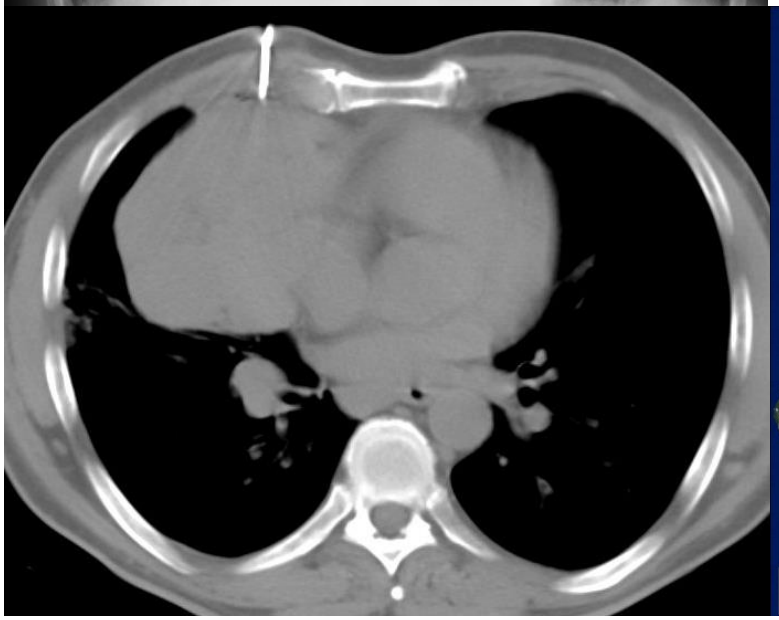


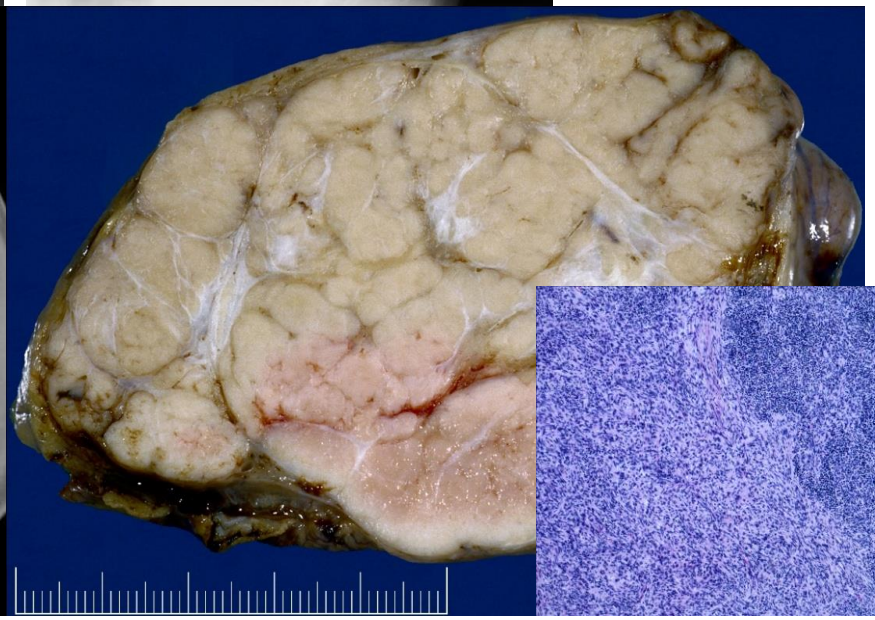
A sharply marginated mediastinal mass seen through the diaphragm must lie entirely within the chest . The posterior costophrenic sulcus extends far more caudally than the anterior aspect of the lungs. fromChen PH, Taipei City, Taiwan

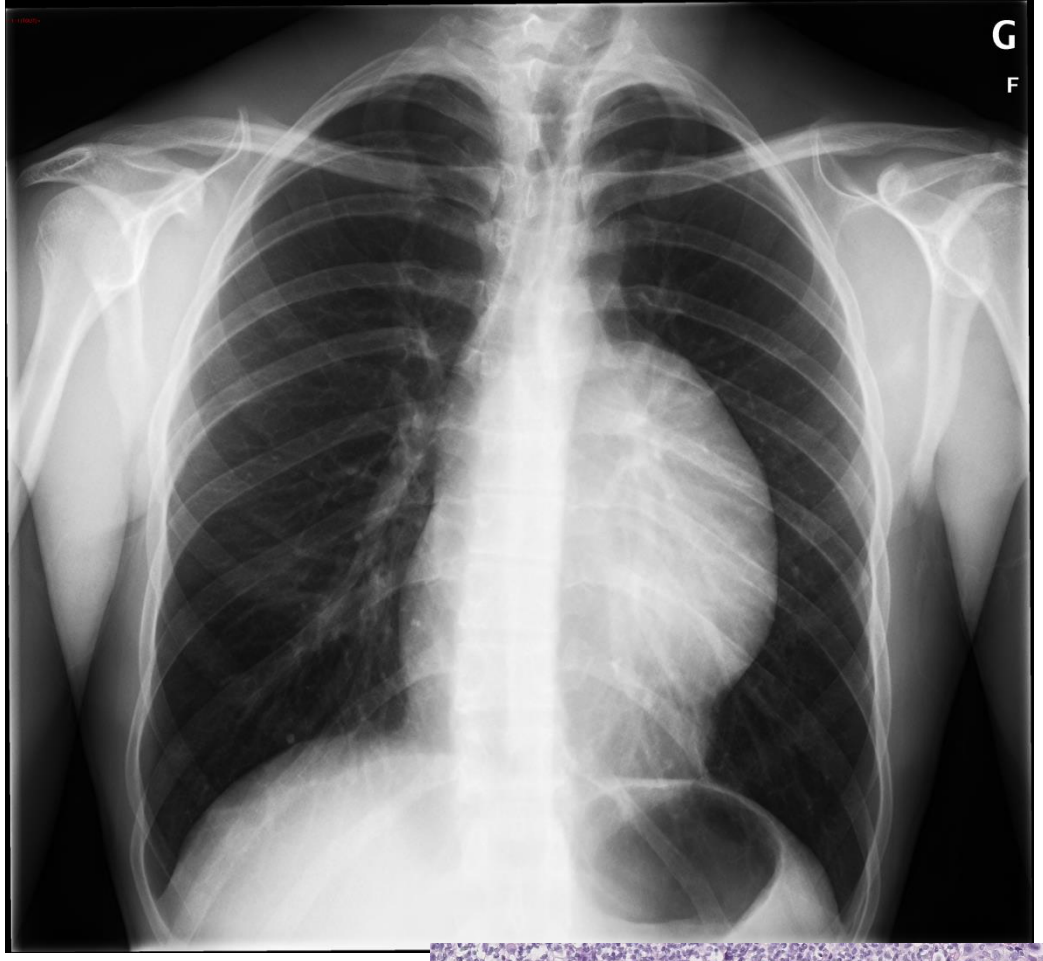
The silhouette sign

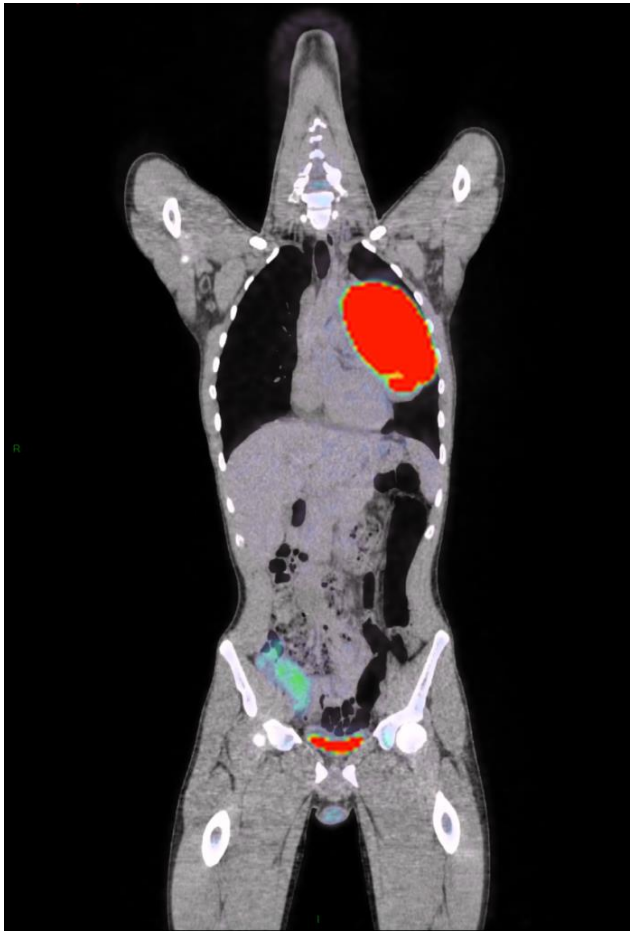
- If an intra-thoracic radio-opacity is in anatomic contact with a border of the heart or aorta, it will obscure that border
- An intra-thoracic lesion not anatomically contiguous with a border or a normal structure will not obliterate that border
- Definition given by Felson in 1950

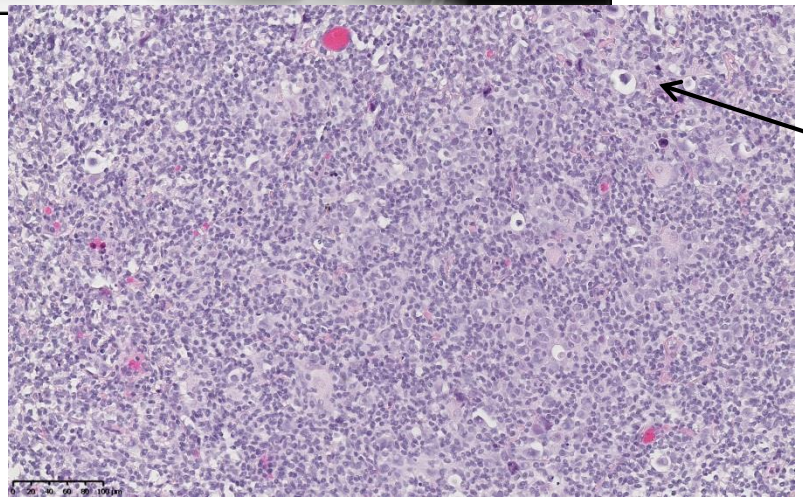








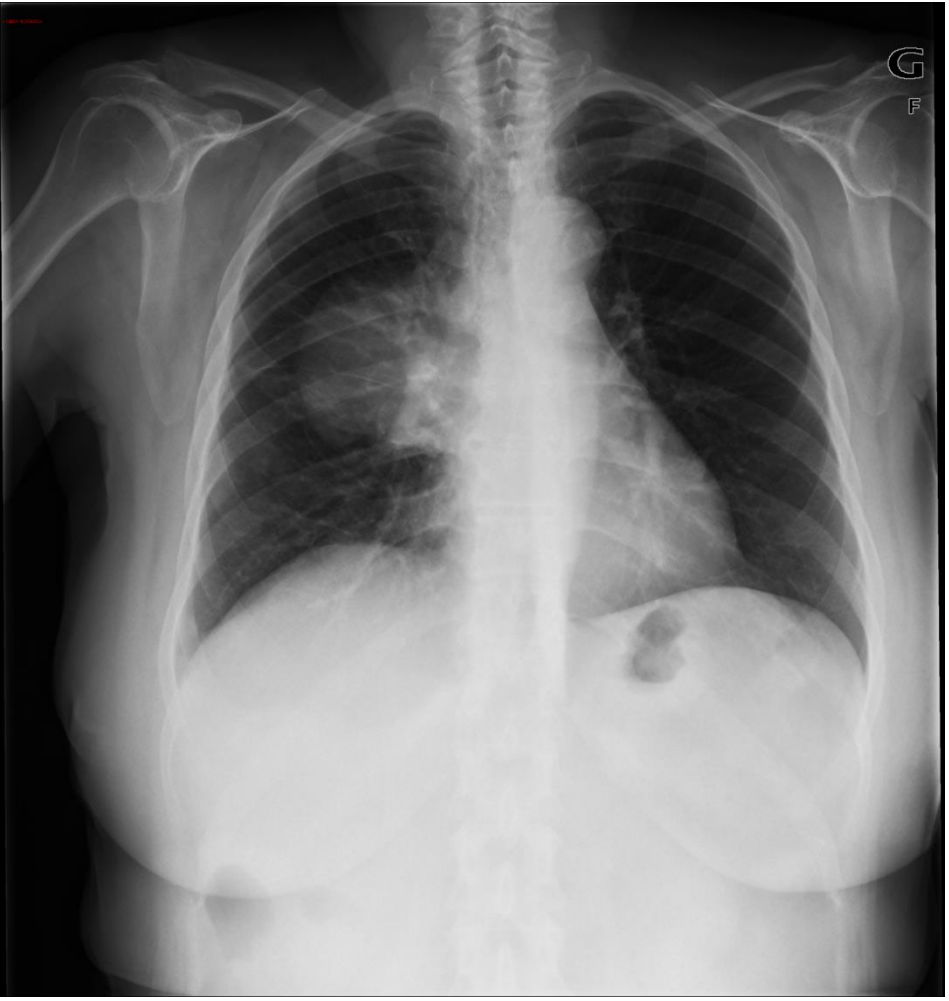


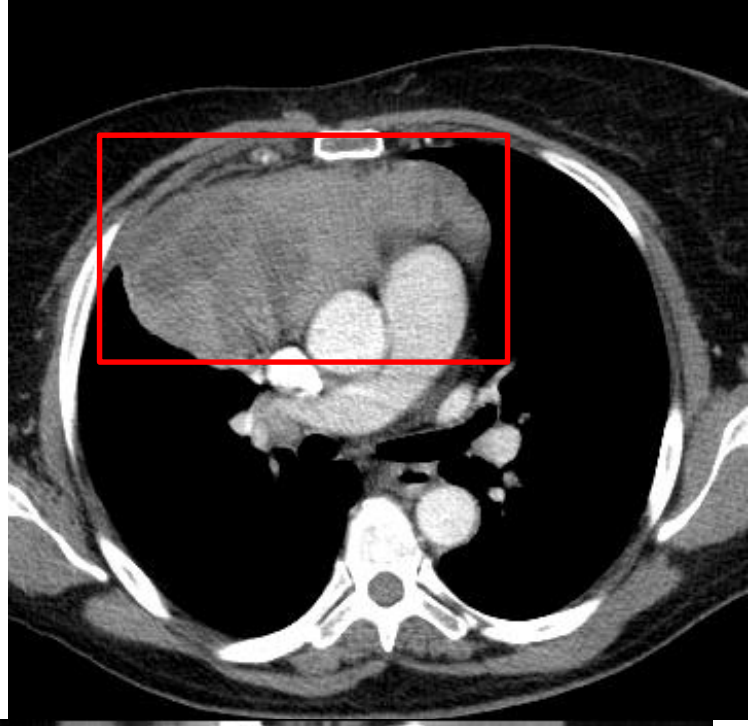


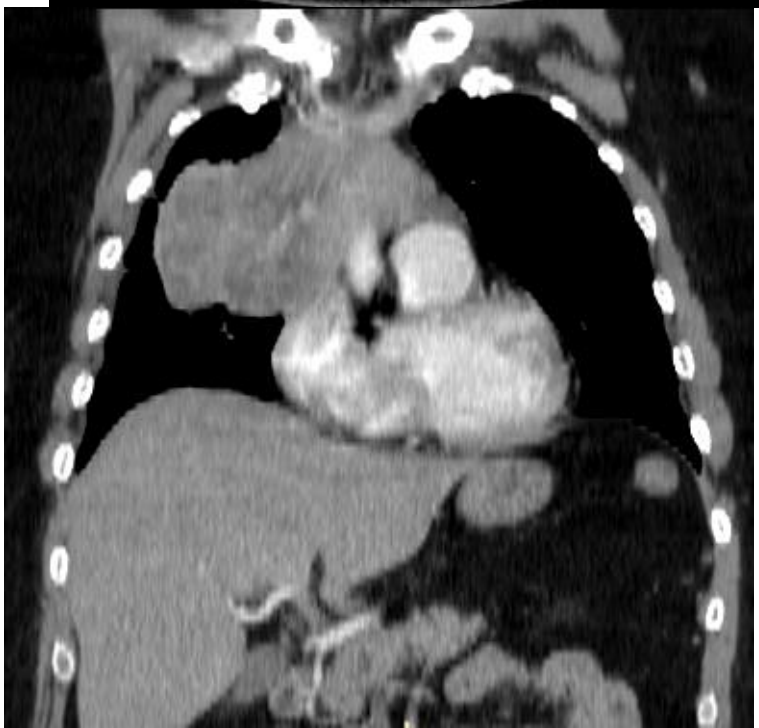
Sternberg's cell Lymphoma

Hilum overlay sign

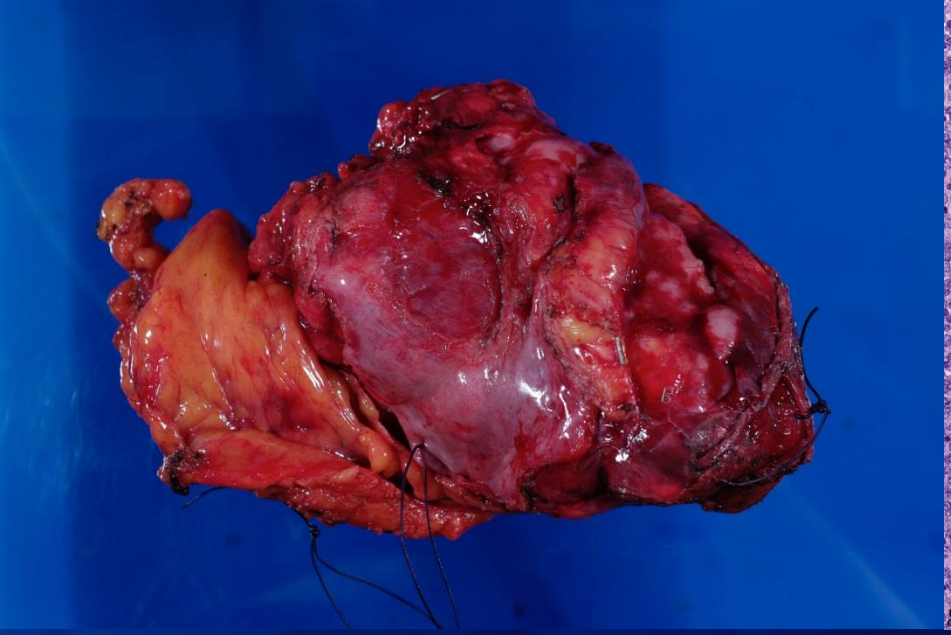
- When there is a mediastinal mass and you can see the hilar vessels through this mass, then you know the mass doe not arise from the hilum

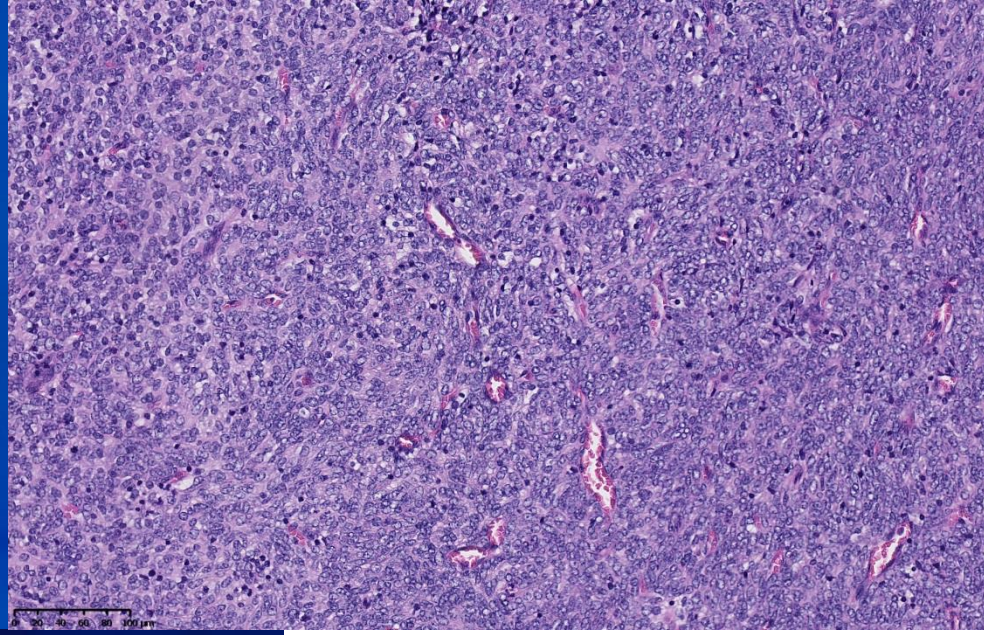


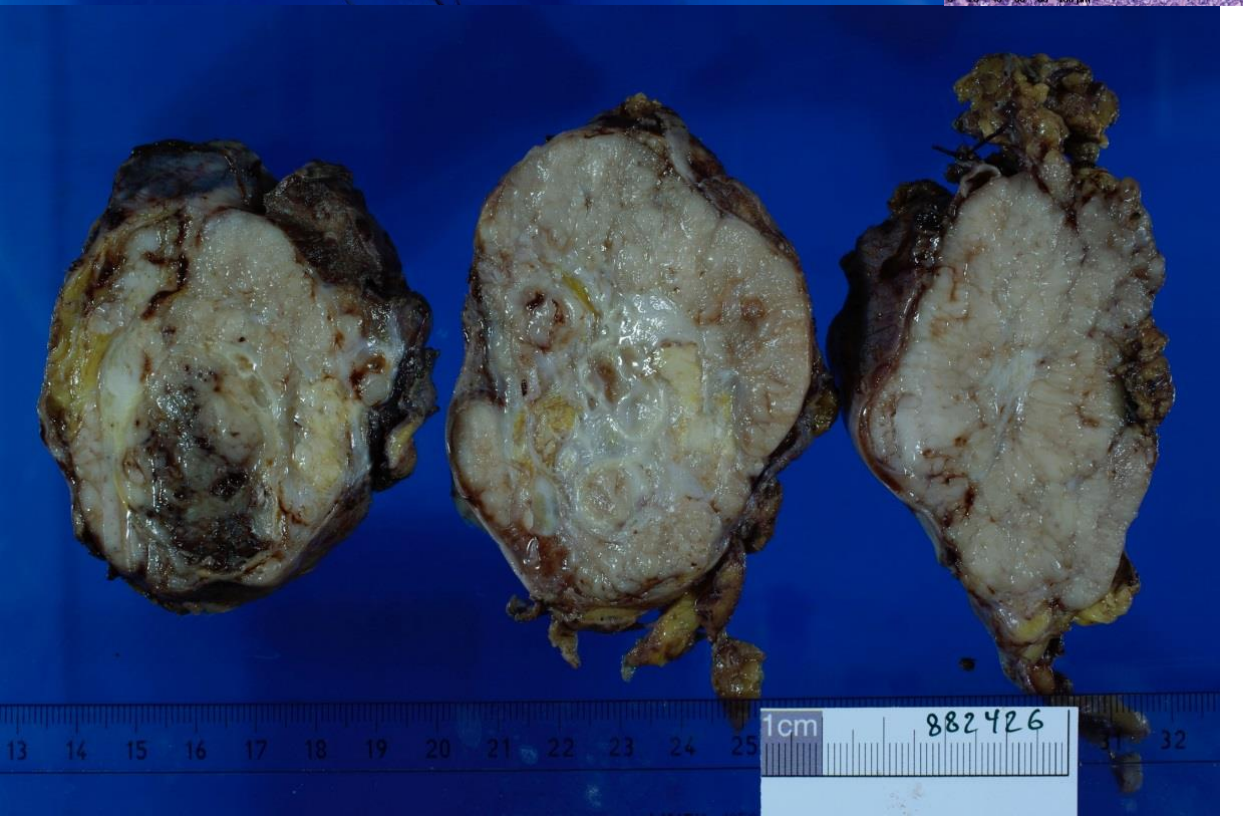




Anterior location





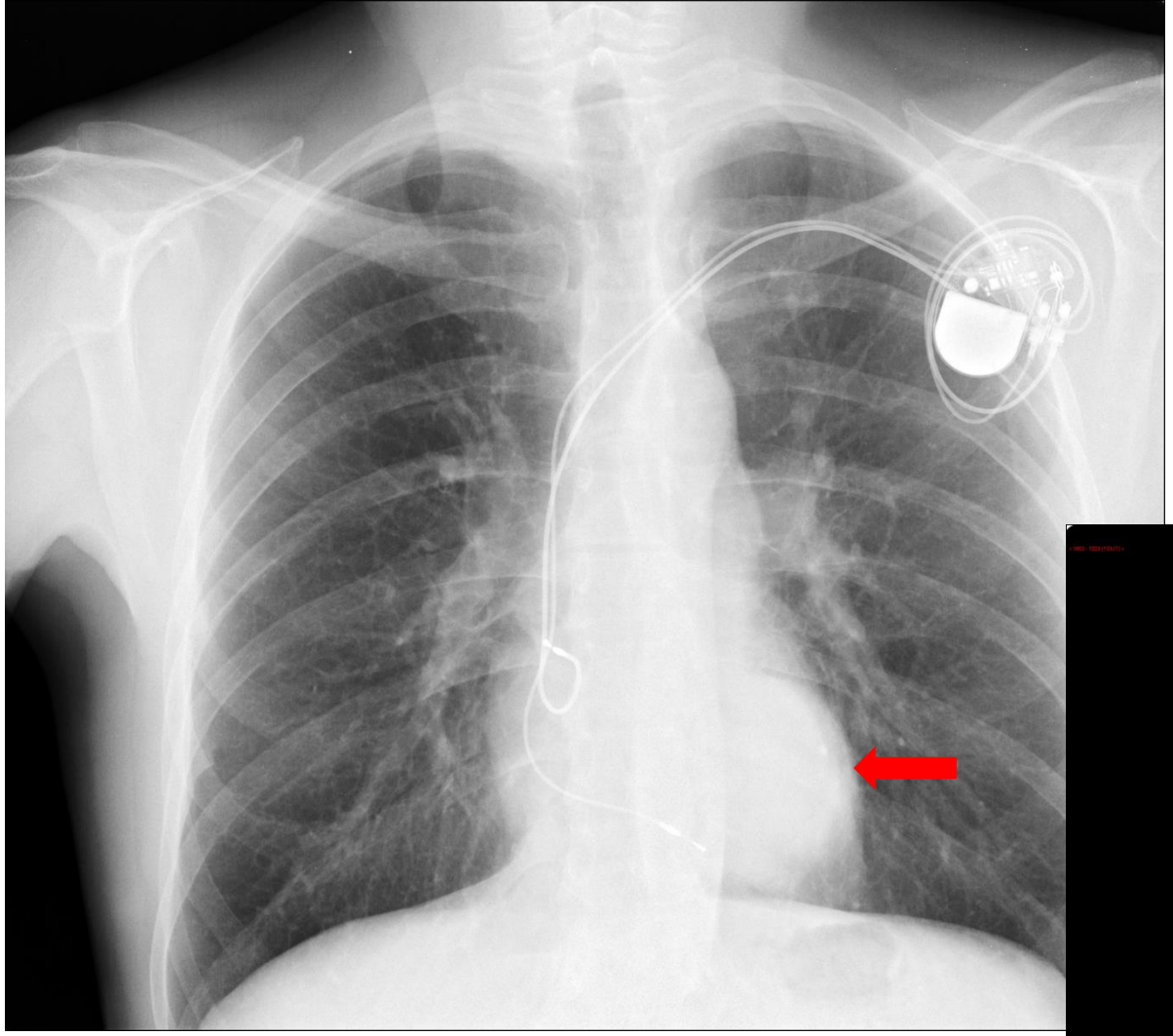


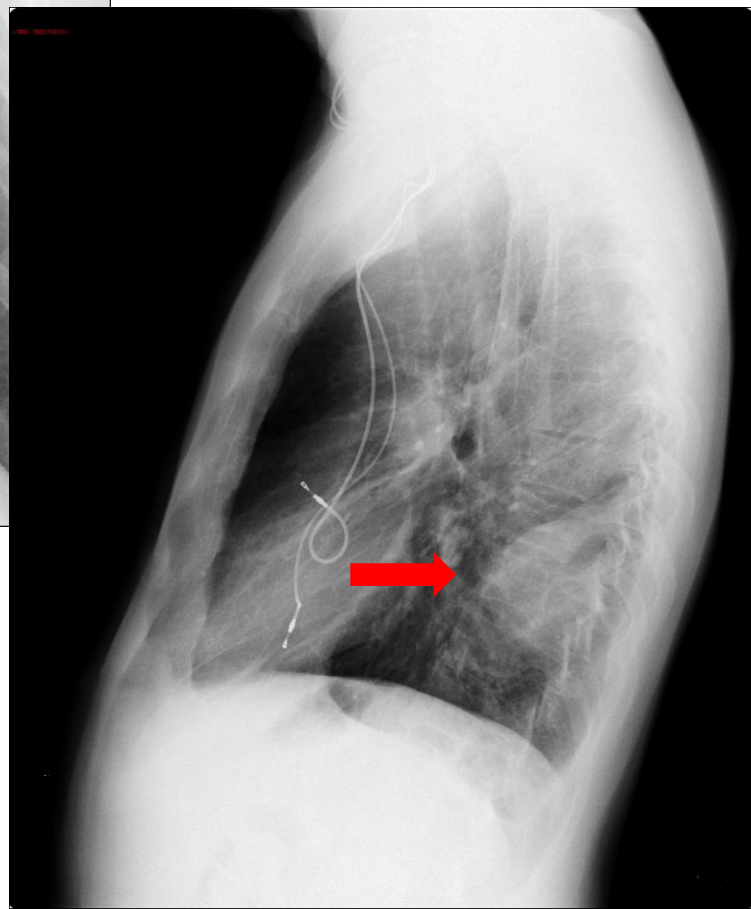
AB Thymoma
HE x 20

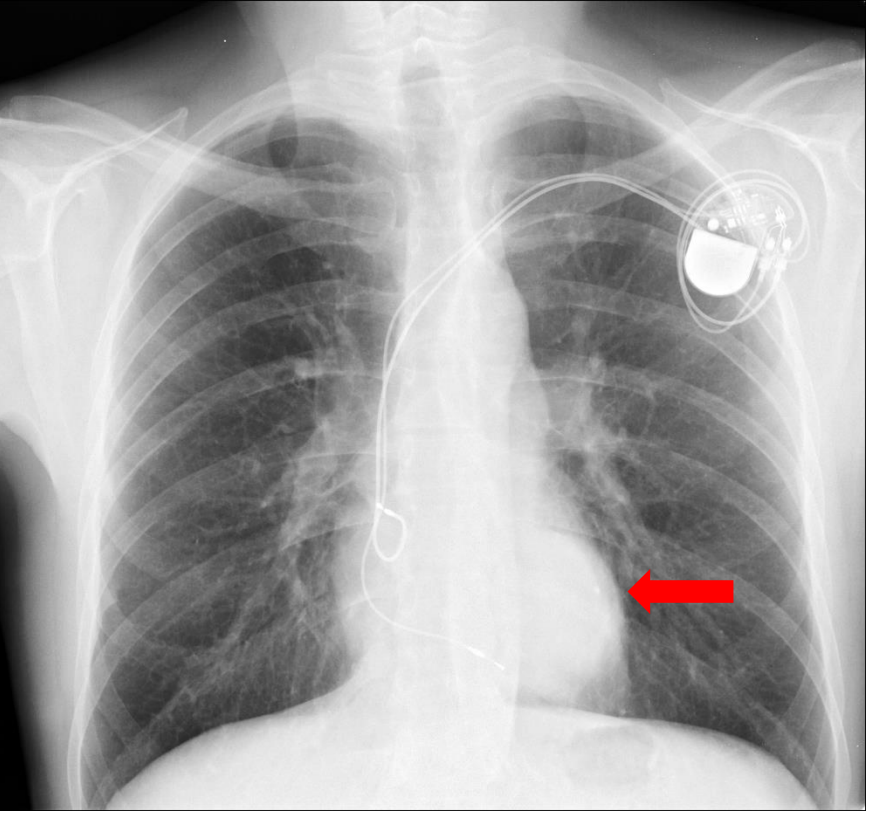
The mediastinum: Clinical cases

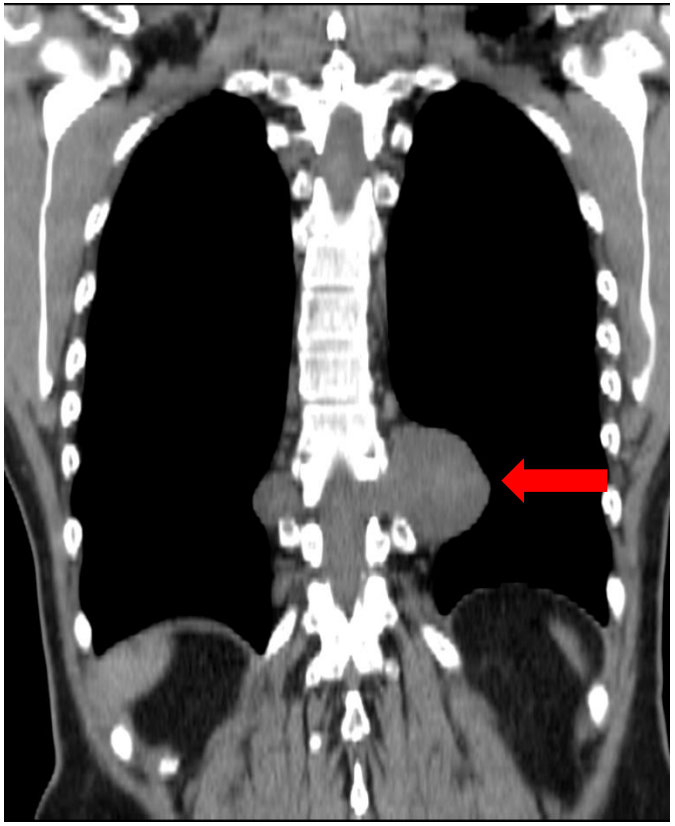
Case 1

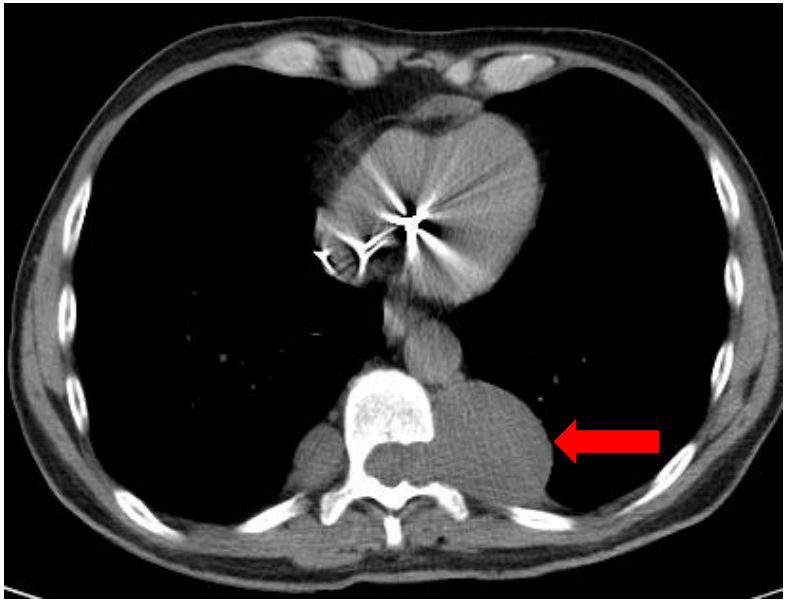
- 58-year old male
- Known for a chronic disorder
- Fibroma in the brachial plexus
  - Pain in both hands
- Pace-maker in 2009 for syncopes
- Chest radiograph for general check-up











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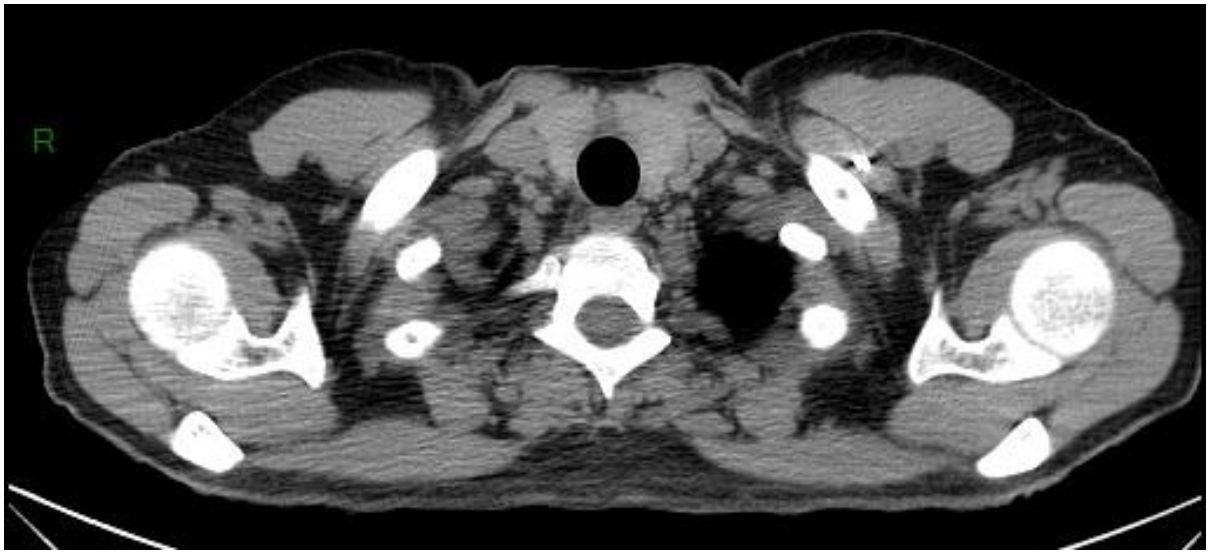
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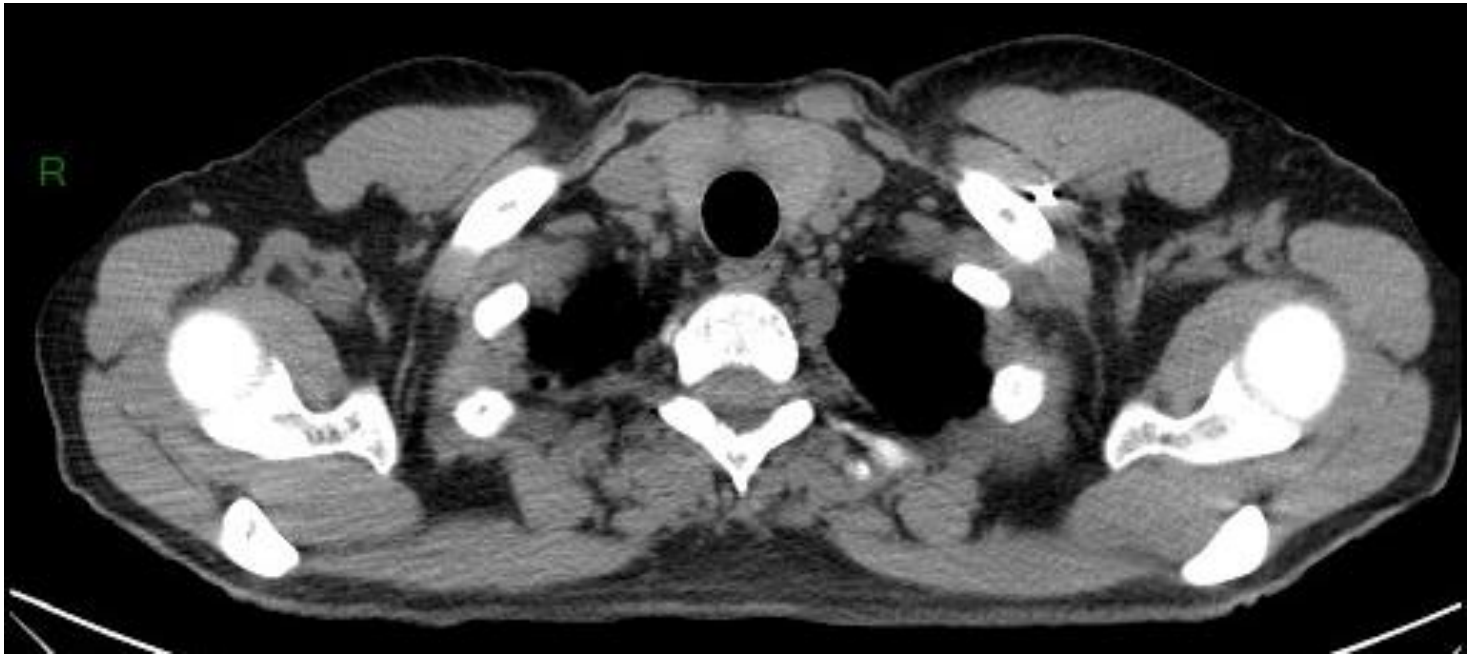
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Q1: Which chronic disease has this patient?

- 1. Type 1 neurofibromatosis
- 2. Autosomial polycystic kidney disease
- 3. Extra-medullary haematopoiesis
- 4. Von Hippel Lindau syndrome
- 5. Gardner syndrome

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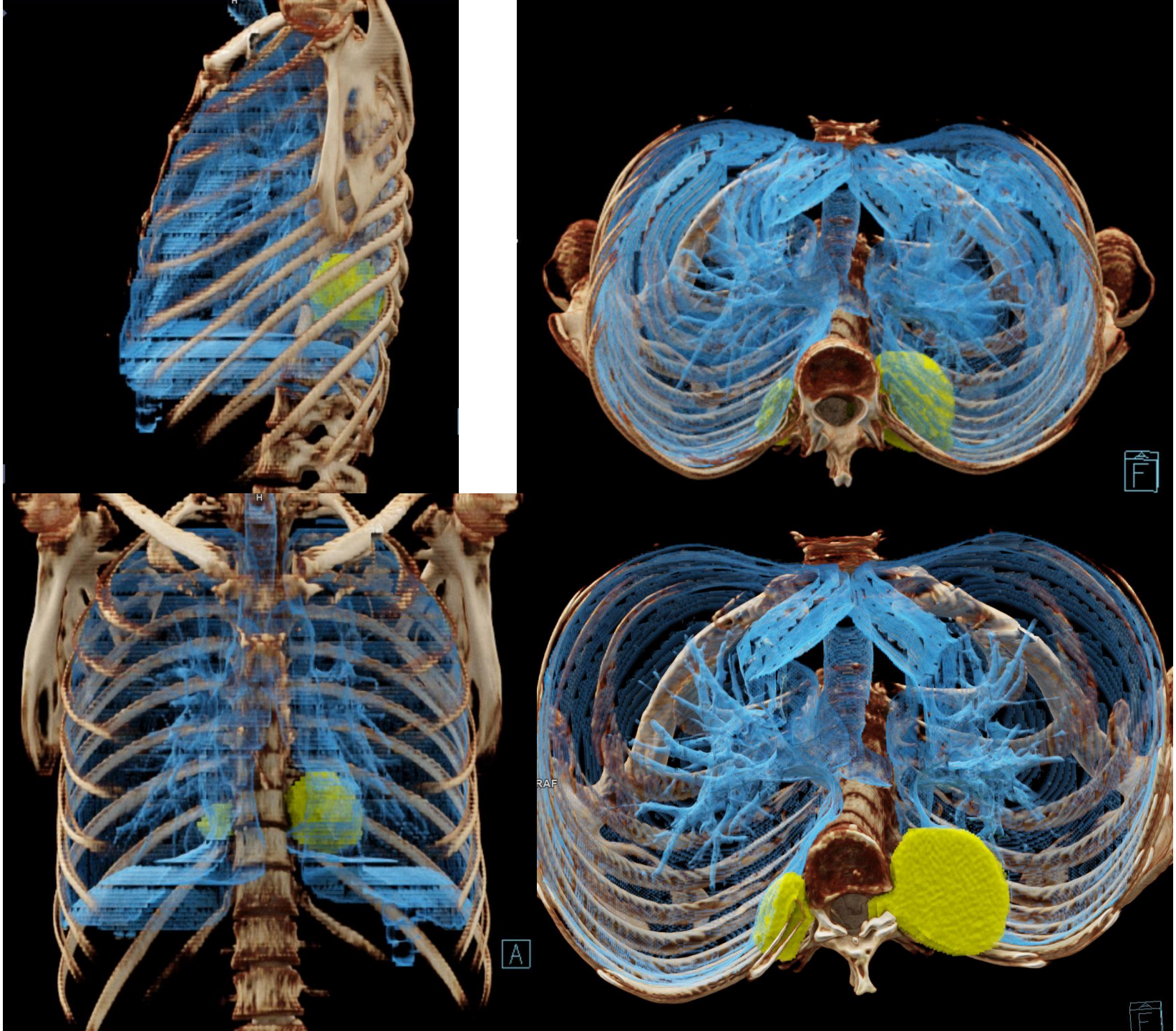
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A

Q2: Which nerves can be involved in this disease?

- 1. Spinal nerves
- 2. Vagus nerve
- 3. Intercostal nerves
- 4. Recurrent laryngeal nerves
- 5. All of the above

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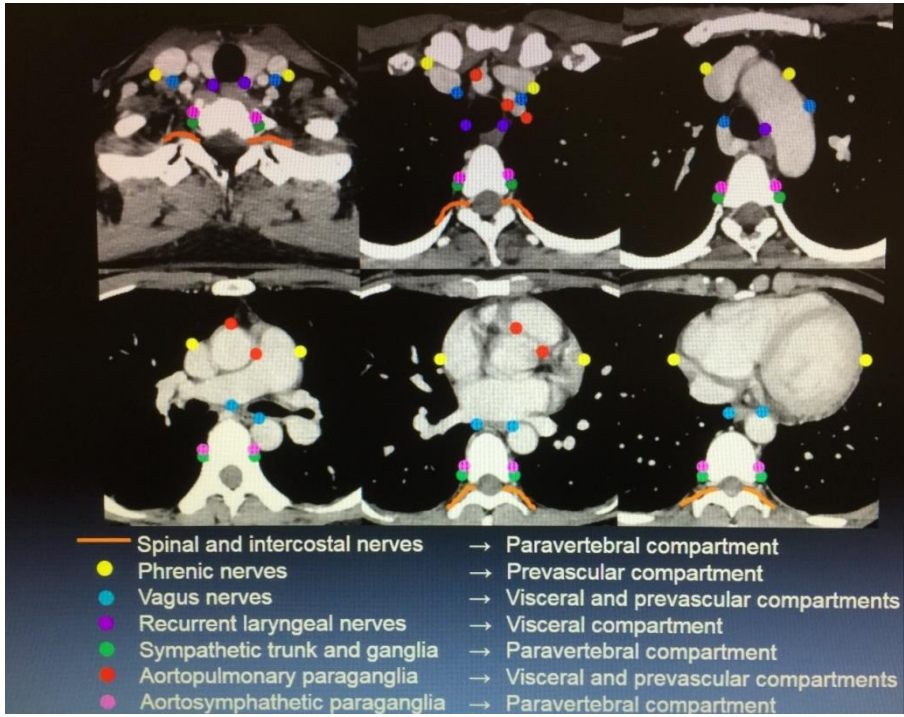
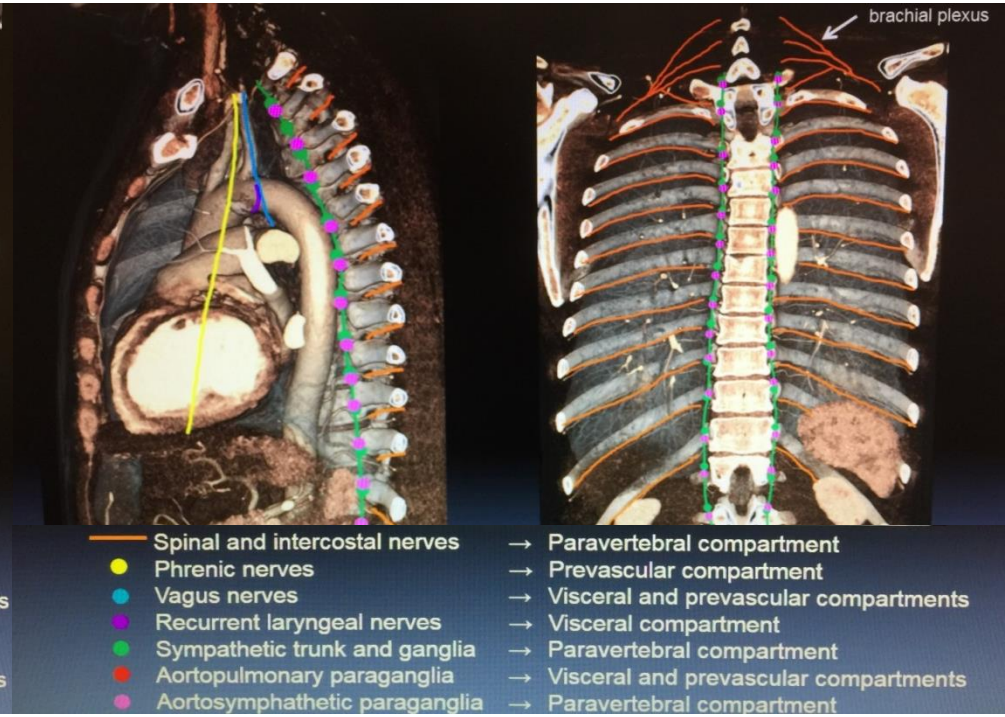
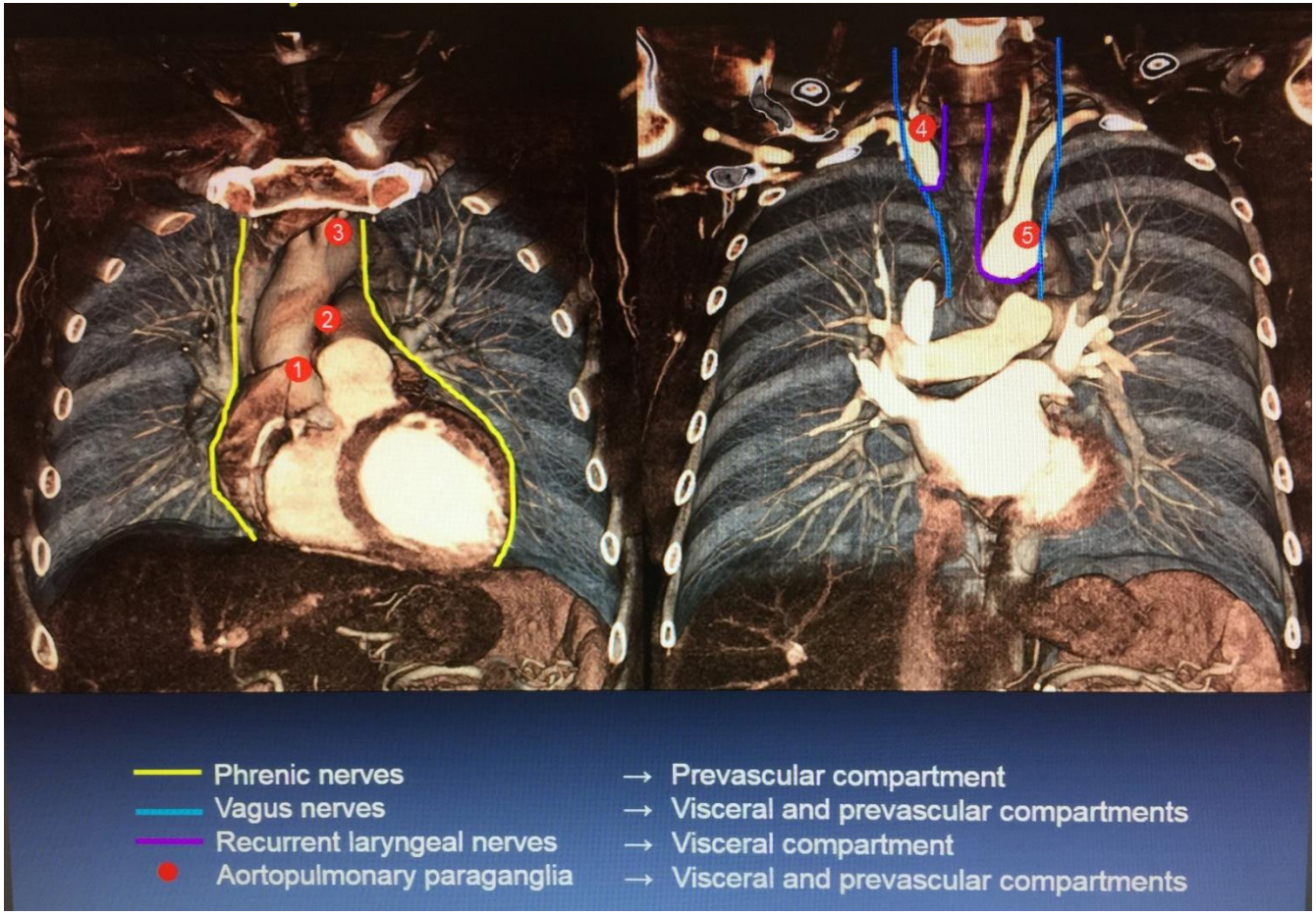
Anatomy of the mediastinal nerves





From Nakazono T et al. New CT-based mediastinal compartment classifications and differential diagnosis of mediastinal tumors. RSNA poster 2017

Anatomy of the mediastinal nerves

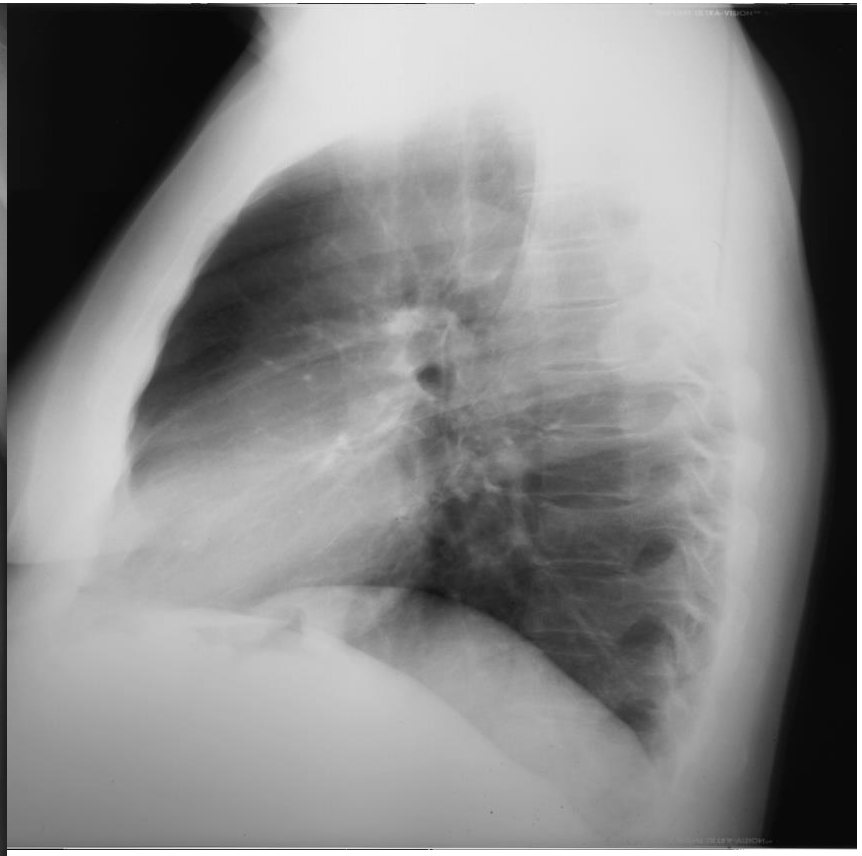


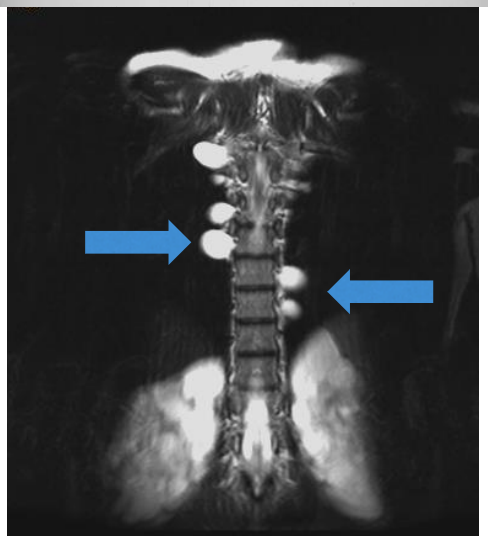
From Nakazono T et al. New CT-based mediastinal compartment classifications and differential diagnosis of mediastinal tumors. RSNA poster 2017

Case 2

- 47-year old woman
- Candidate to cadaveric kidney transplantation
- Mild hypertension
- Known for autosomial dominant polycystic kidney disease (ADPKD)
- Chest radiograph

Q3: Localize the abnormalities on the PA view





C4. What is your diagnosis?

- 1. Bilateral paraganglioma
- 2. Paraspinal meningeal cysts
- 3. Extramedullary hematopoiesis
- 4. Bilateral neurofibroma
- 5. Pleural fibromatosis

Coche E, et al. Multiple thoracic paraspinal meningeal cysts in autosomal dominant polycystic kidney disease. Am J Kidney Dis 2003;41(2):E8

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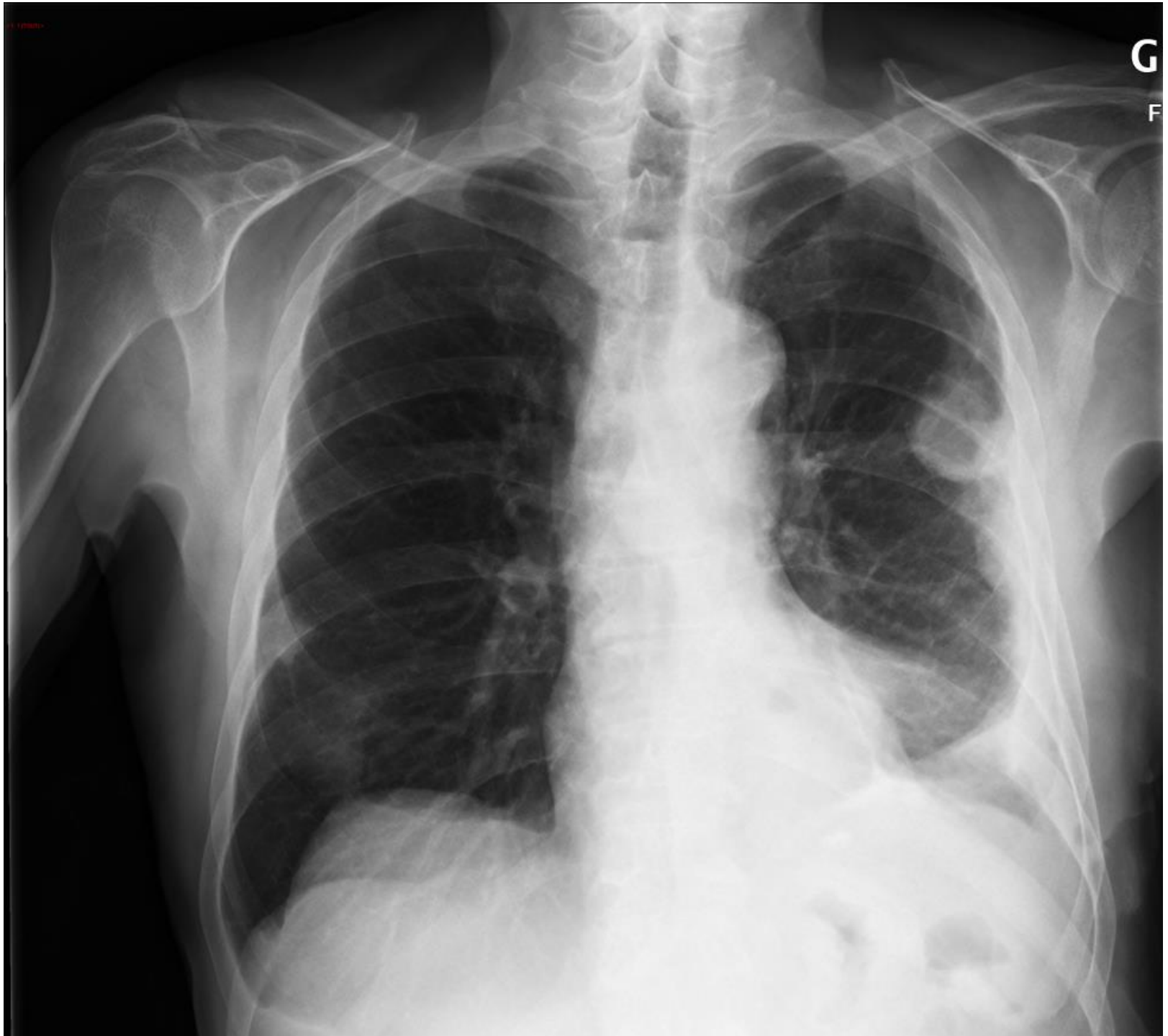
Coche E, et al. Multiple thoracic paraspinal meningeal cysts in autosomal dominant polycystic kidney disease. Am J Kidney Dis 2003;41(2):E8

Case 3

- 65-year old man
- Tobacco
- C2H5OH
- Admitted for vascular surgery ‘abdominal aneurysm
- Chest X ray


G
F

C5. Localize the mediastinal abnormality?

- 1. Displacement of the azygo-oesophageal line
- 2. Obscuration of the paravertebral line
- 3. Obscuration of the para-aortic line
- 4. Displacement of the posterior pleural line
- 5. None of the above

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- 3. Obscuration of the para-aortic line
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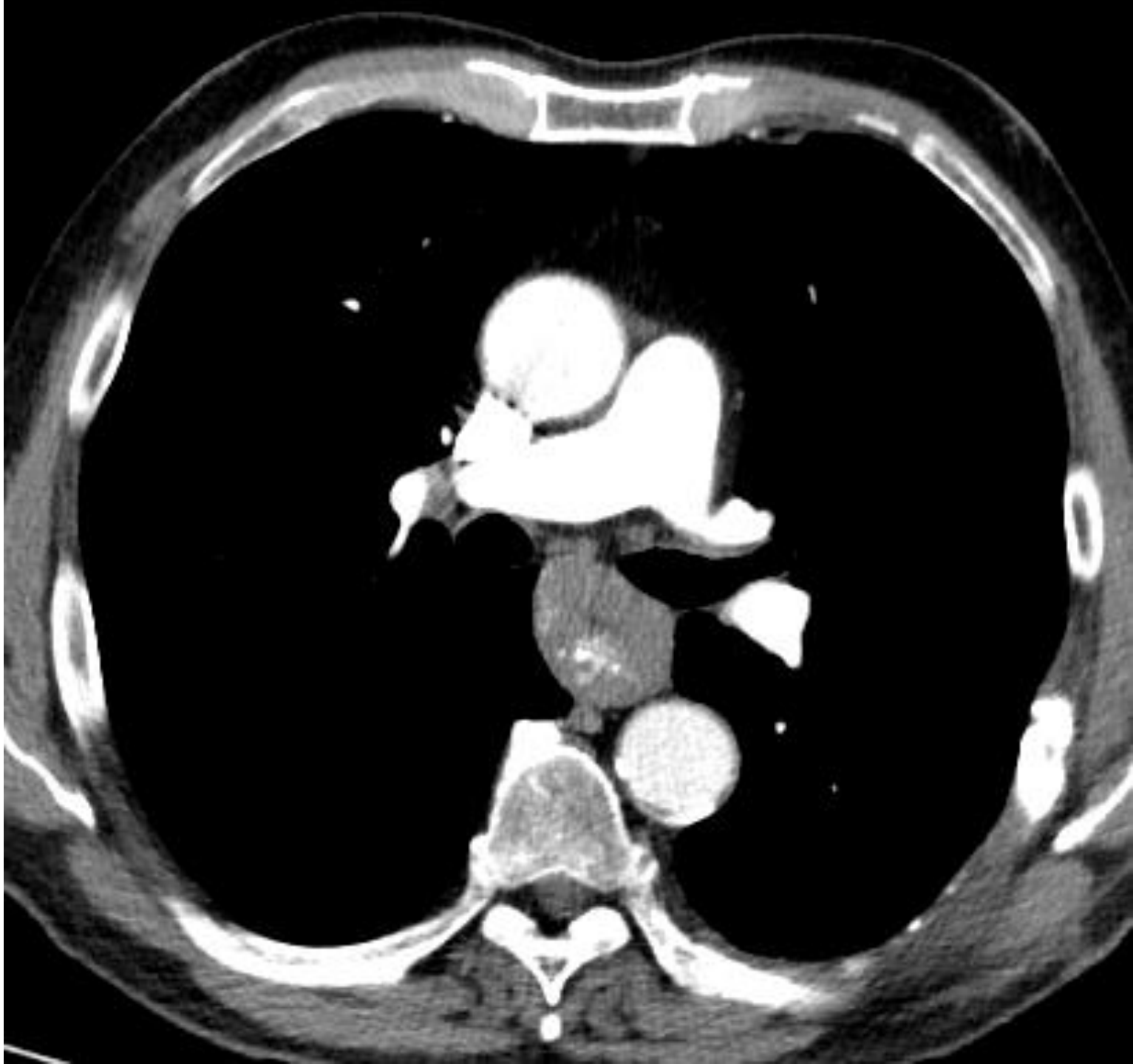
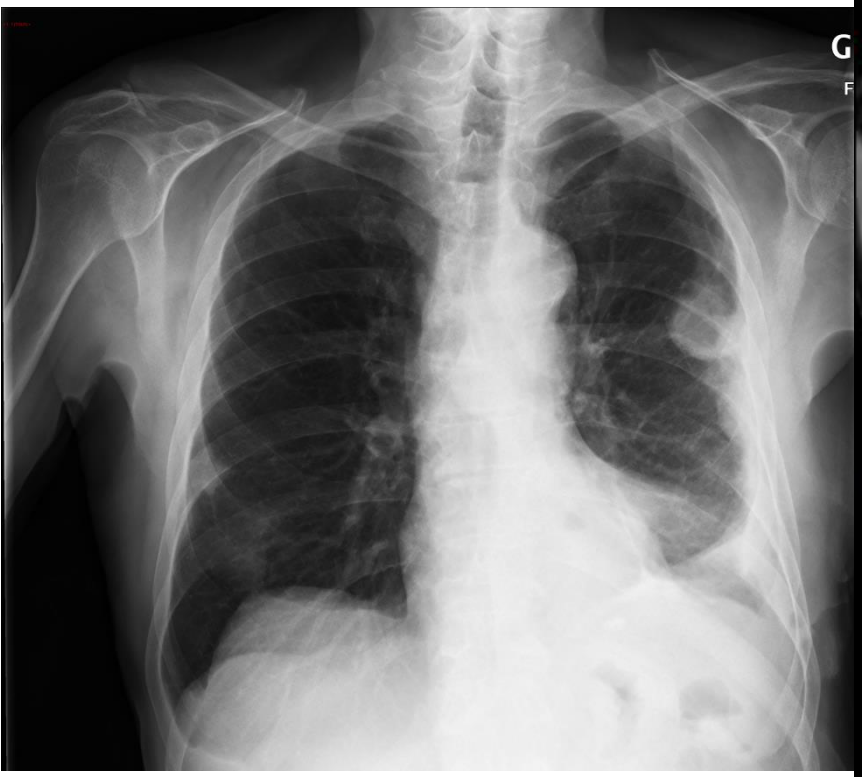
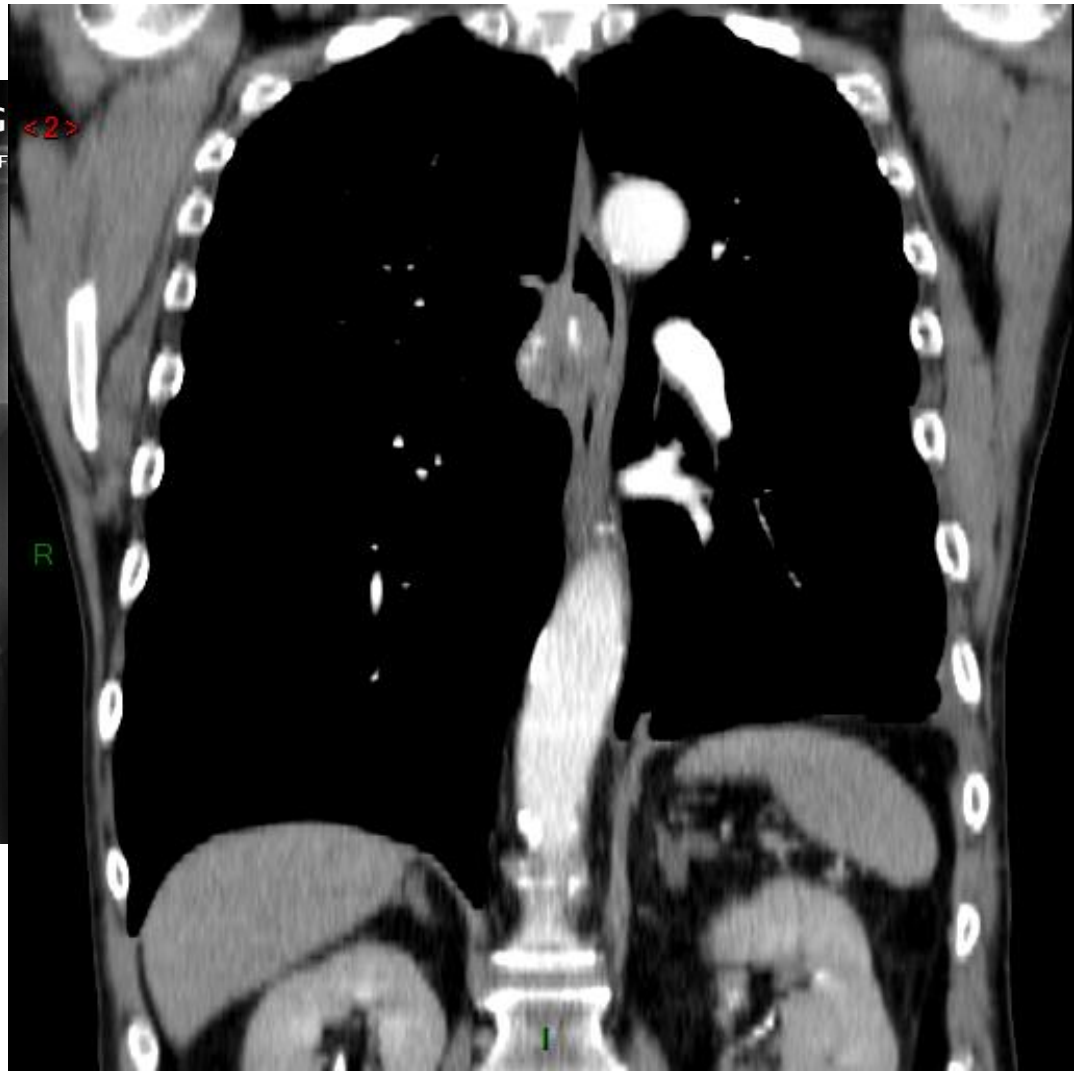
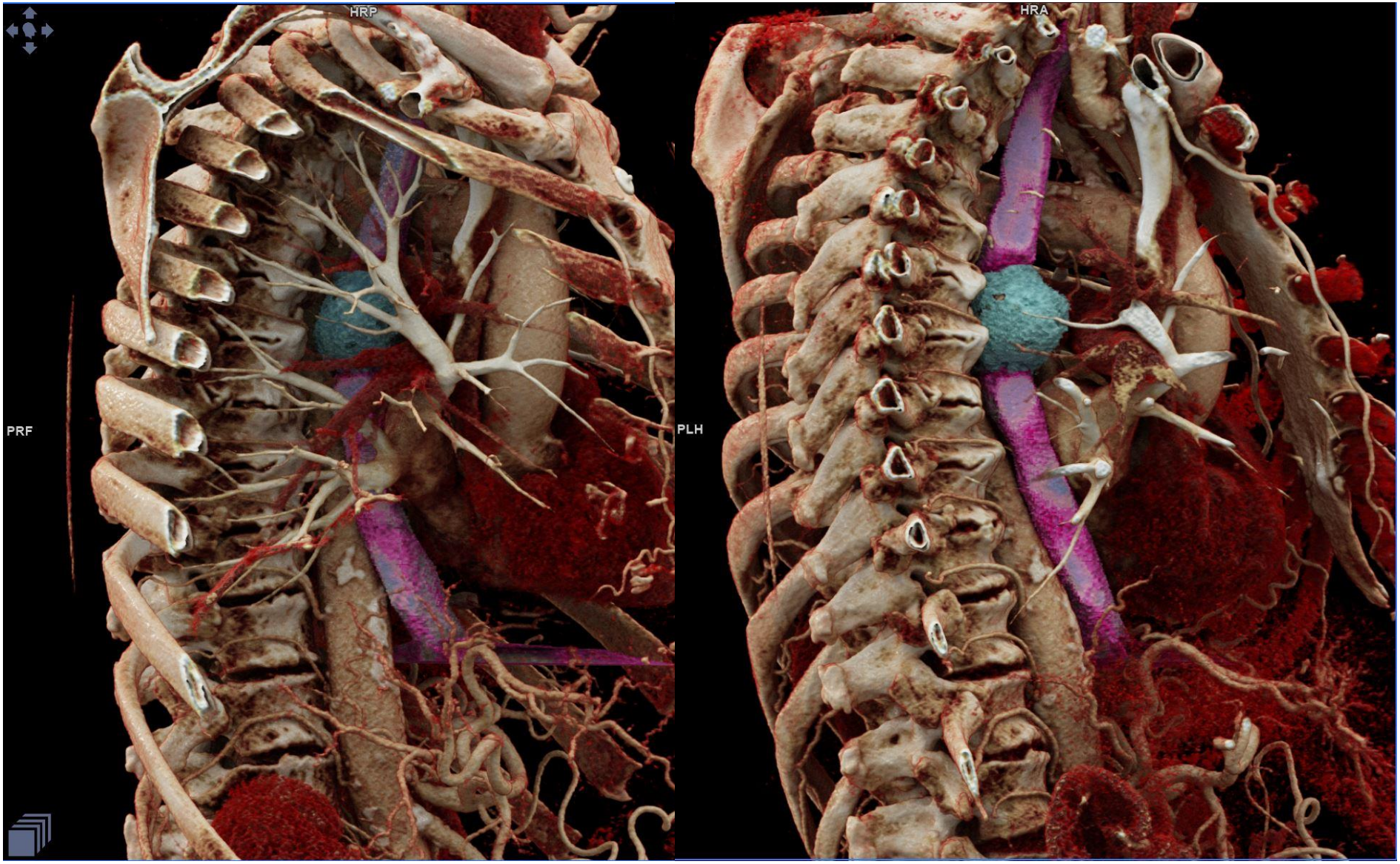





R
I


HPL
LPF


H
P


HRP
PRF
PLH
HRA

C6. What is the most likely diagnosis?

- 1. Oesophageal leiomyoma
- 2. Extramedullary haematopoesis
- 3. Lymphadenopathy
- 4.Lymphangioma
- 5. Duplication cyst

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- 1. Oesophageal leiomyoma
- 2. Extramedullary haematopoesis
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- 4.Lymphangioma
- 5. Duplication cyst

Case 4

- 37-year old male
- Admitted for RCUH exacerbation
- Episodes of diarrhea
- Elevation of CRP (182 mg/dL, Nl < 5 mg/dL)
- No chest pain

Case 4

C7.Is the chest radiograph normal?

- 1. Yes
- 2. No
- 3. maybe
- 4. I do not know and I call immediately an expert chest radiologist

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- 1. Yes
- 2. No
- 3. maybe
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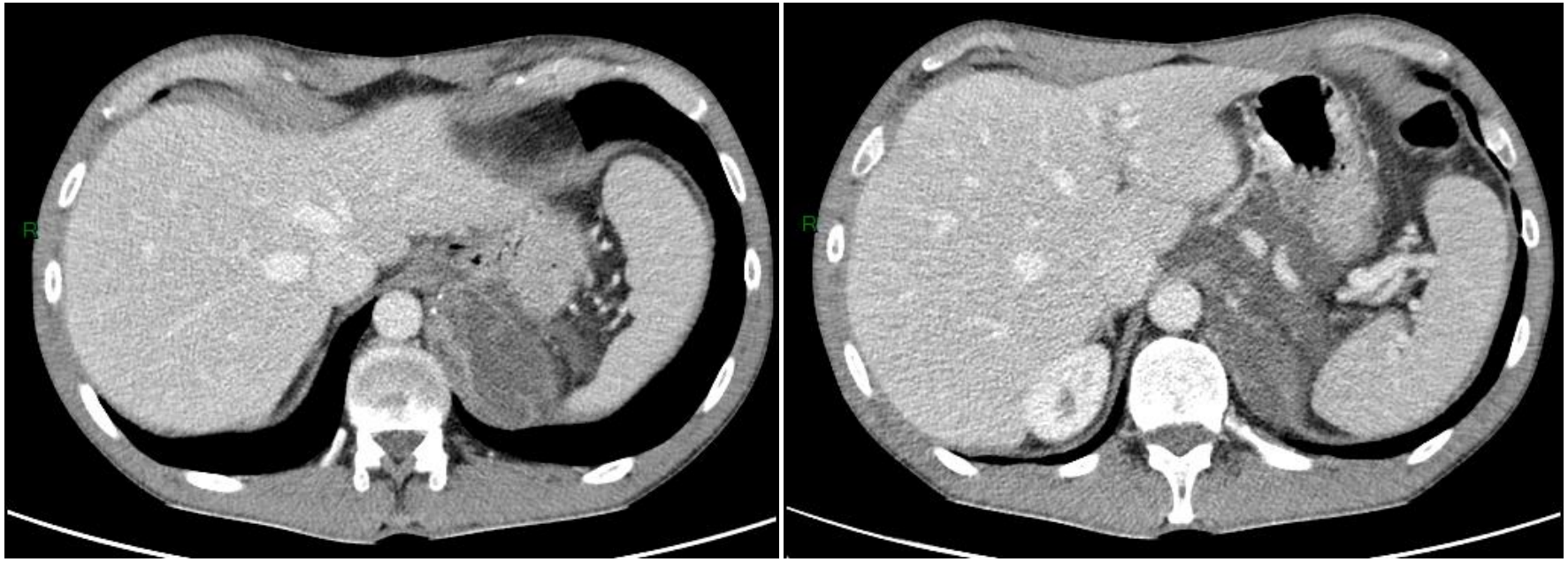
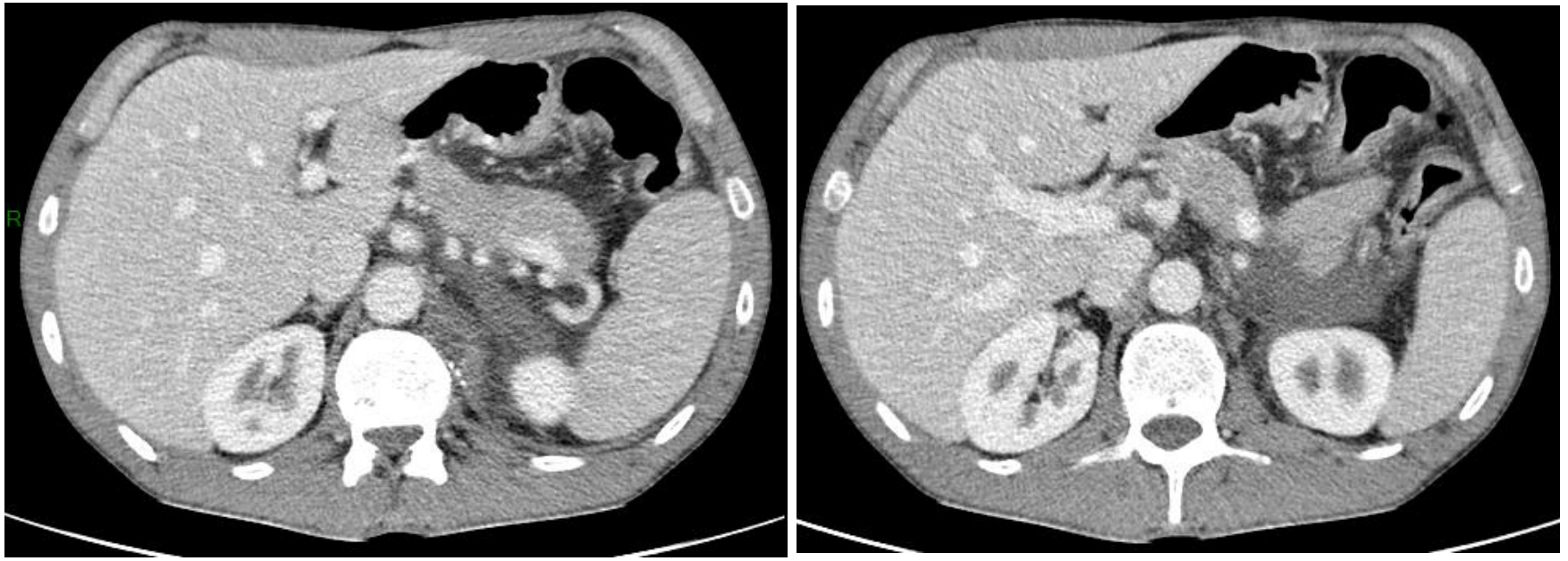


CT: 02/11/2017



C8 What is the most likely diagnosis?

- 1. Extra-lobar sequestration
- 2. Intra-lobar sequestration
- 3. Cystic lymphangioma
- 4. Pancreatic pseudocyst
- 5.Diaphragmatic lymphoma

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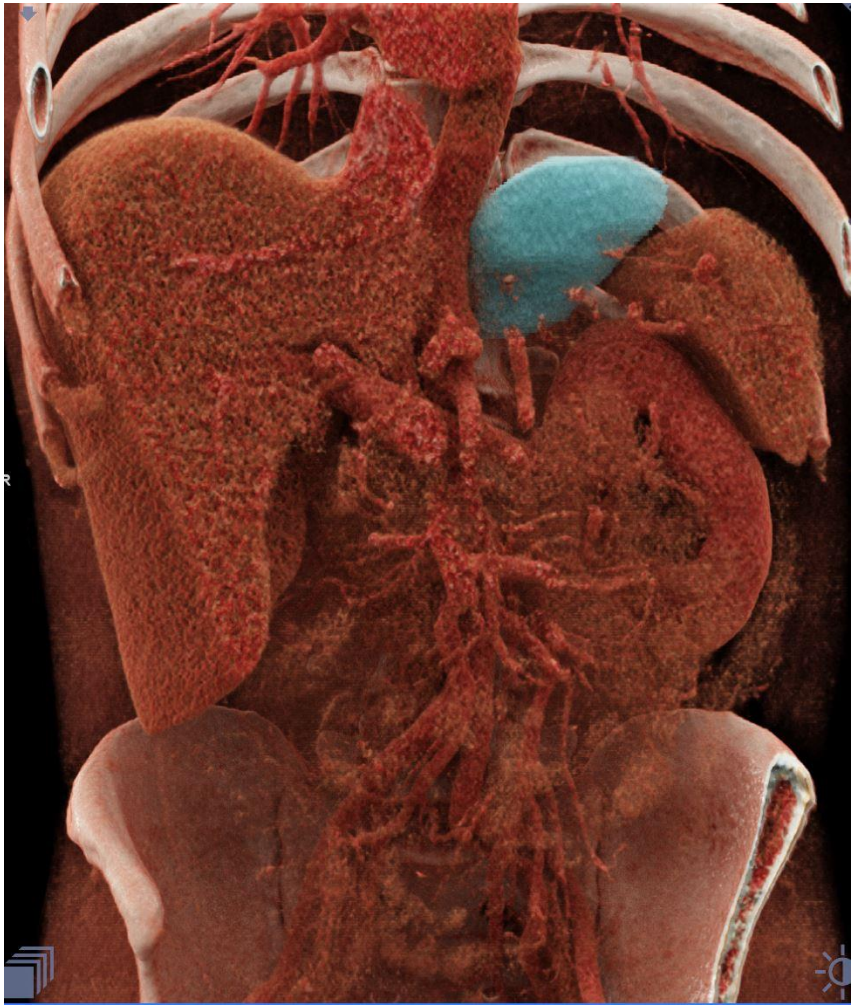
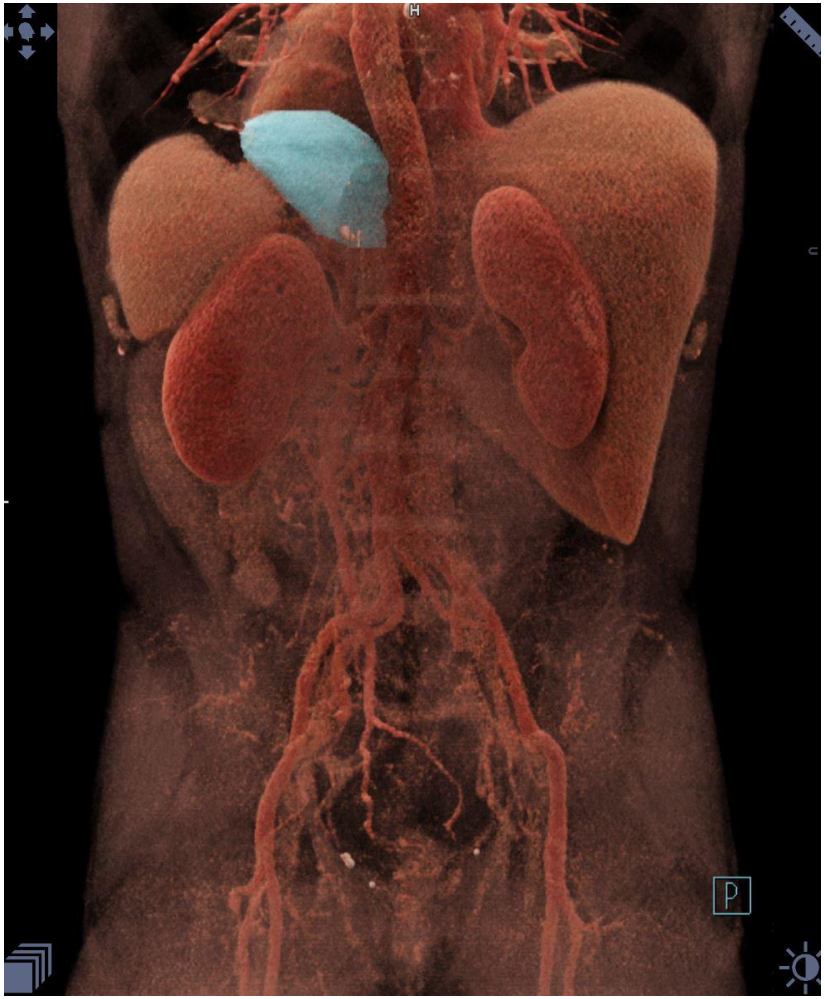
A-P View

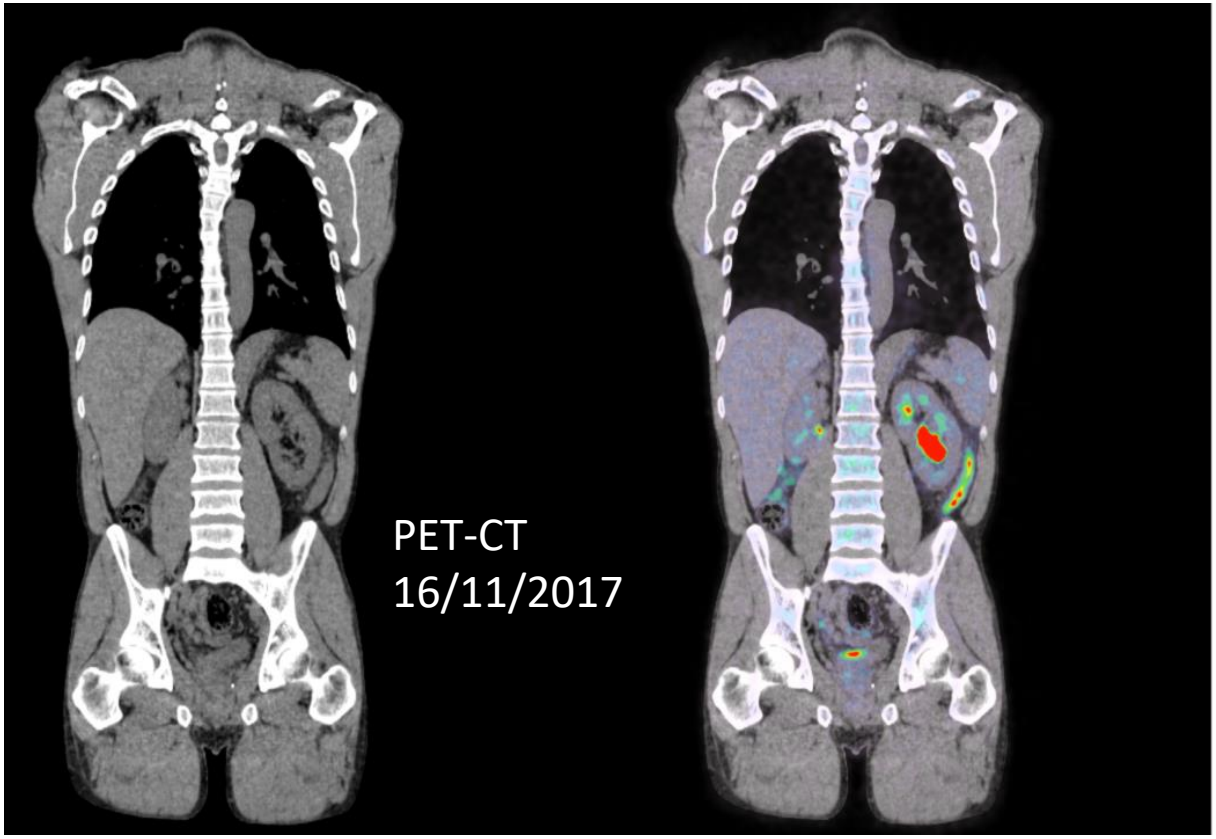
P-A View

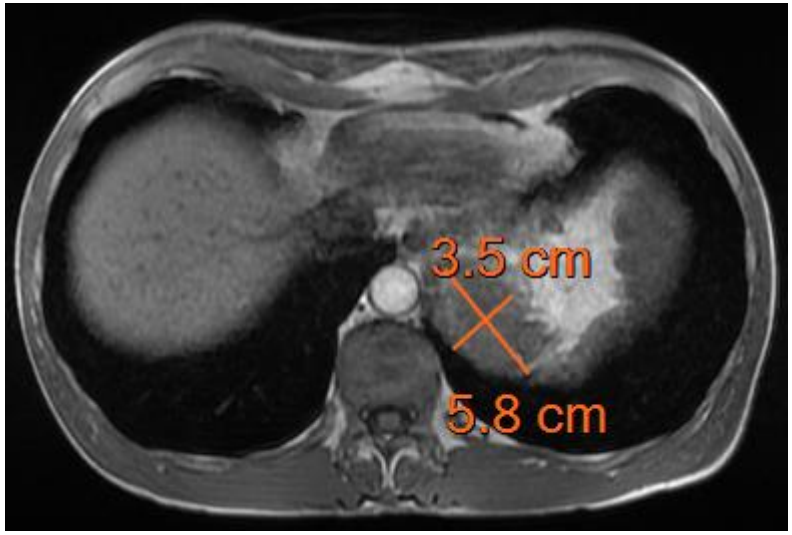


A-P View



P-A View


PET-CT
16/11/2017


3.5 cm
5.8 cm


MR:
05/12/2017

CT : 13/07/2014

Figure 1. Drawing illustrates the probable embryologic origin of extralobar sequestration. An anomalous bud (arrow) arises from the primitive foregut (*f*), forming an "accessory" lung that has its own pleural covering. The developing lungs (*l*) are seen in their normal anatomic location.

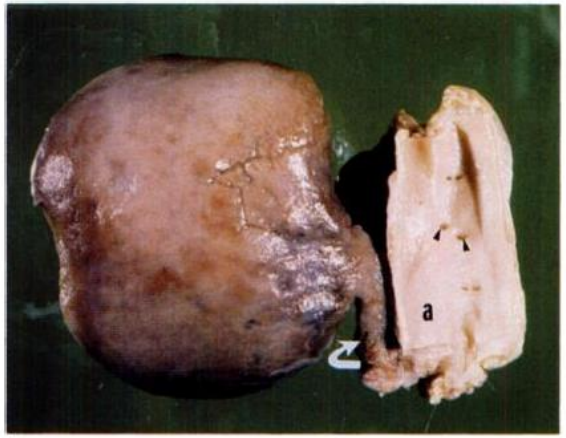


Figure 4. Autopsy specimen of extralobar sequestration found beneath the right hilum demonstrates a vascular pedicle (arrow) coursing from the posterior aspect of the thoracic aorta (*a*). The orifices of two anomalous vessels (arrowheads) (multiple vessels supplied this lesion) are noted on the aortic wall. Orifices of paired intercostal arteries are seen above and below. (Reprinted, with permission, from reference 19.)

cm have been described (2,10). By definition, extralobar sequestration, when in the thorax, has a pleural covering. Its surface is shiny with a smooth or wrinkled texture, and a fine reticular pattern of dilated subpleural lymph vessels is often visible (Fig 3a). If infected, the lesion may be encased in thick connective tissue or may be adherent to adjacent structures such as the lung, mediastinum, or diaphragm (2). Extralobar sequestrations with foregut communication (ie, bronchopulmonary foregut malformations) are joined to the esophagus or stomach by a thick fibrous stalk (2).

On cut section, the tissue is firm, spongy, and homogeneous, with color ranging from pink to tan. Bronchi and vessels may be seen near one edge of the lesion (Fig 3b) (2,19). Grossly cystic areas may be present rarely and typically contain clear or viscid fluid (10,22, 23). The lesions do not contain air unless there is patent communication with foregut-derived structures.

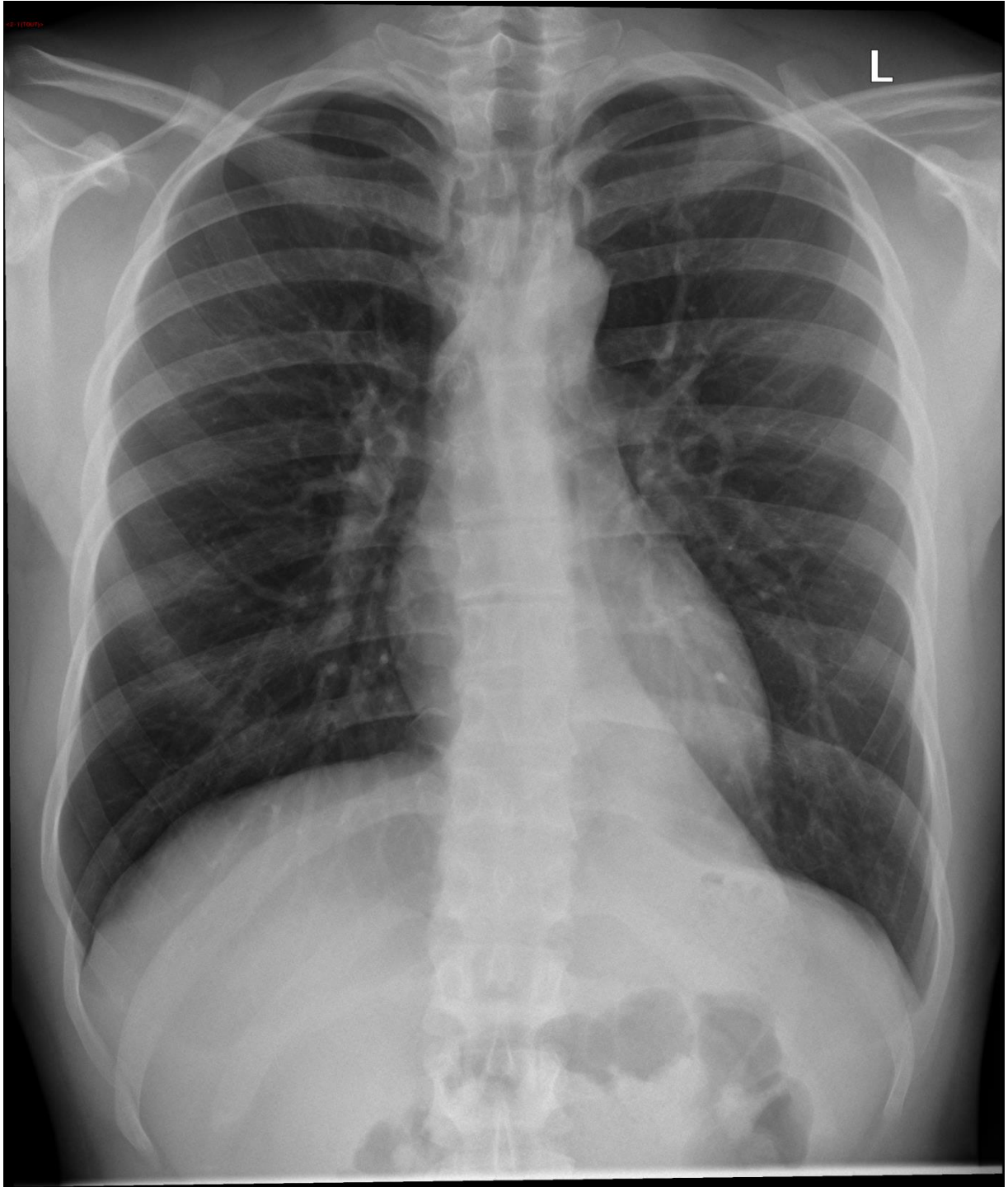
Extralobar sequestration is typically found in the thorax and on the left side (65%–90% of cases) (2,7,16). The typical location is within the pleural space in the posterior costodiaphragmatic sulcus between the diaphragm and the lower lobe (63%–77% of cases) (2,24). These lesions may also be found in the mediastinum or within the pericardium. Approximately 10%–15% of extralobar sequestrations are found within or below the diaphragm (2,10).

The blood supply of extralobar sequestrations is typically from systemic arteries. These arise directly from the thoracic or abdominal aorta in approximately 80% of cases (Fig 4). The feeding vessel is typically single and measures between 0.5 and 2 cm in diameter. In

Rosado-de-Christenson, et al. Extralobar sequestration: radiologic-pathologic correlation. From the archives of the AFIP. Radiographics 1993;13:425-441

Case 5

- 26-year old man
- Chest pain in Ireland
- No other clinical signs
- Peptic oesophagitis at 1 year
- Chest radiograph


L

C9. What is the most likely diagnosis?

- 1. Left inferior atelectasis
- 2. Left inferior pneumonia
- 3. Left inferior Lung tumor
- 4. Extra-pulmonary sequestration
- 5. Other

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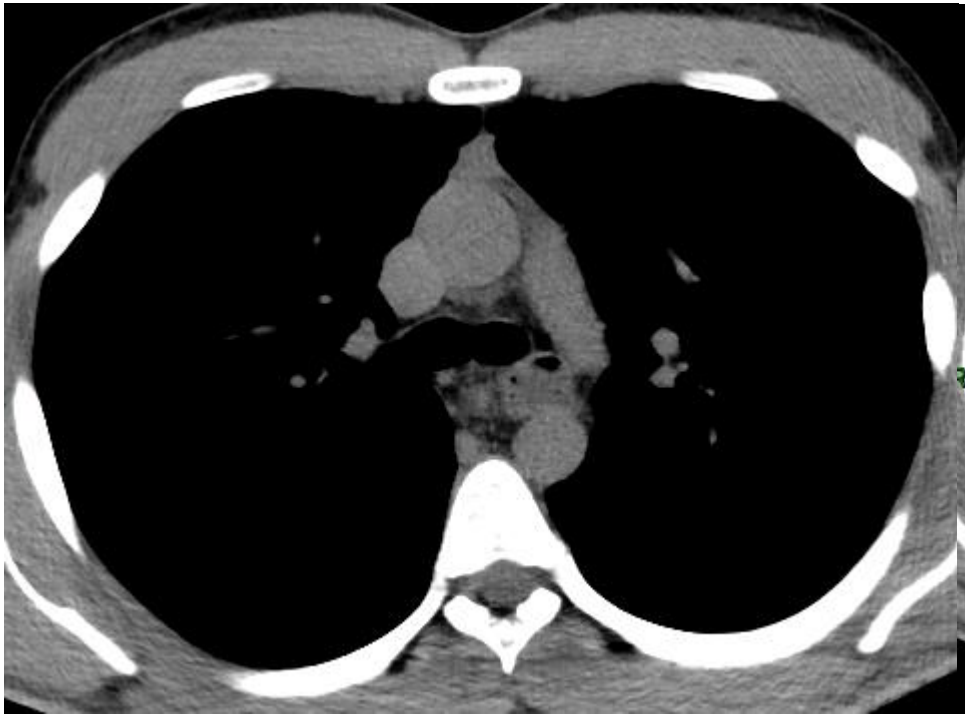
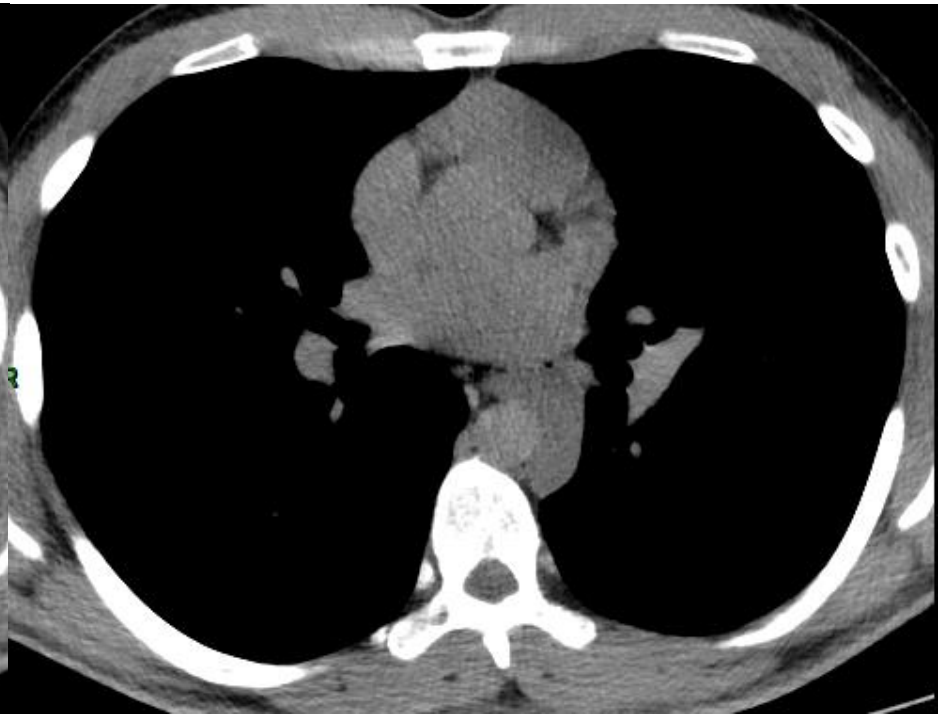
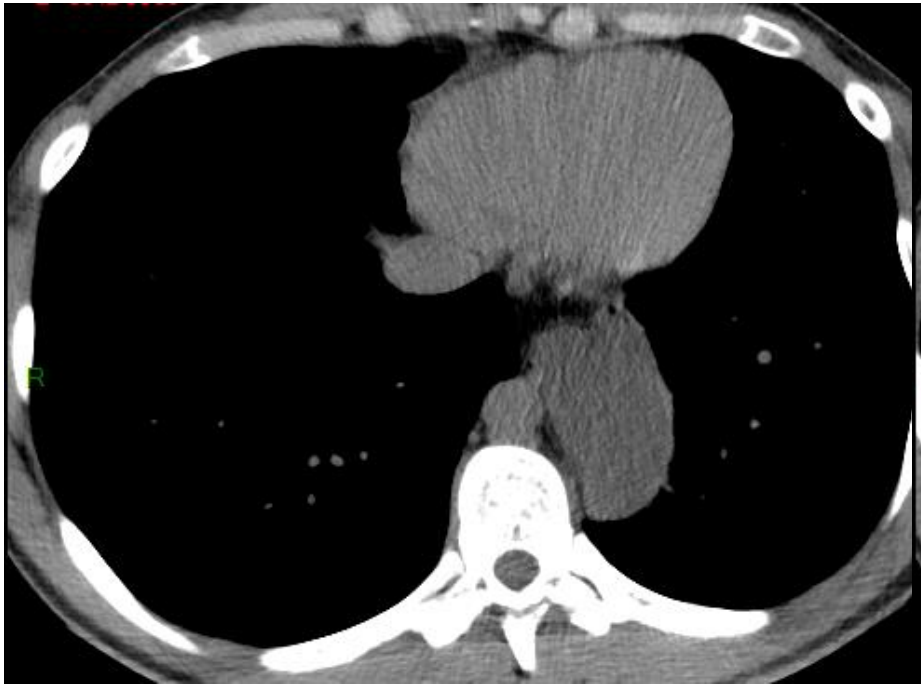
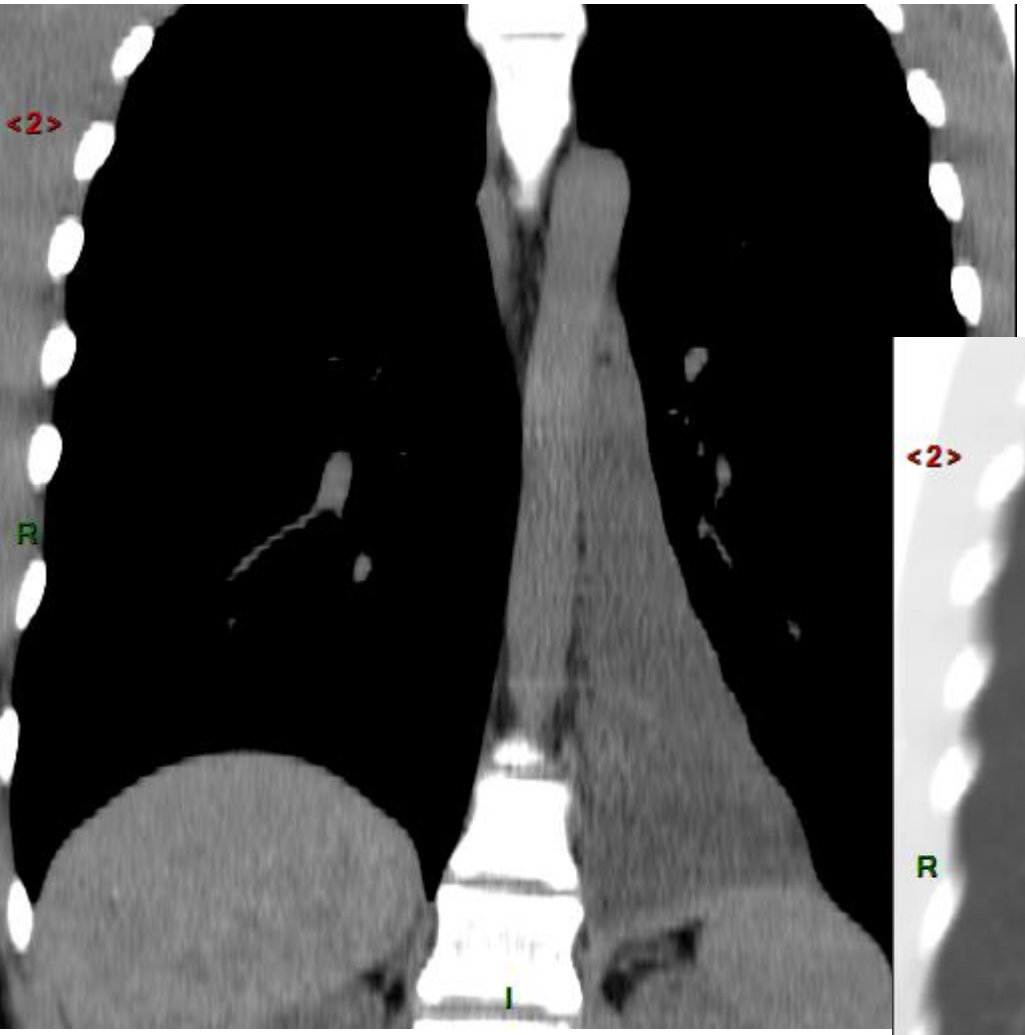
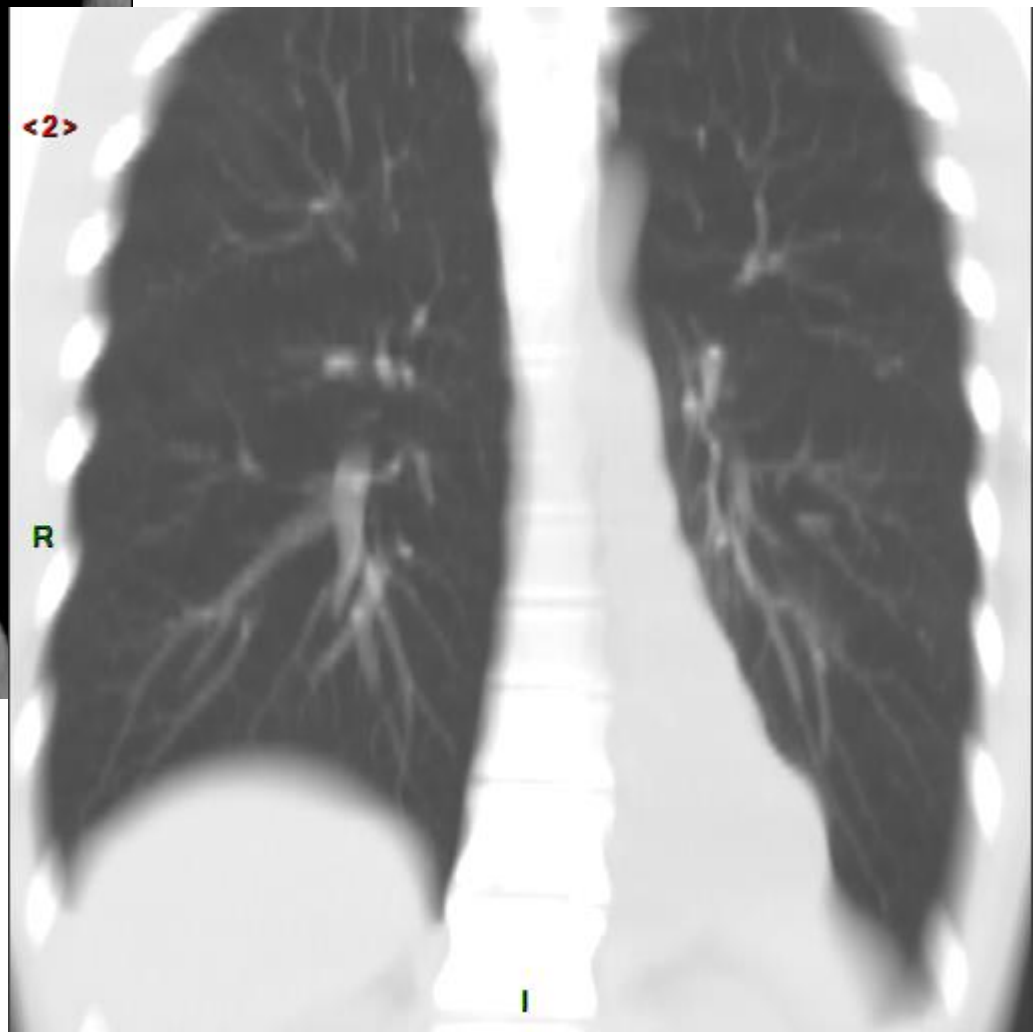




MPR 40 mm
Lung window setting



Case 6

- 56-year old man patient
- Chest pain
- Low grade fever
- Liver transplantation
- Chest X-ray


G
F

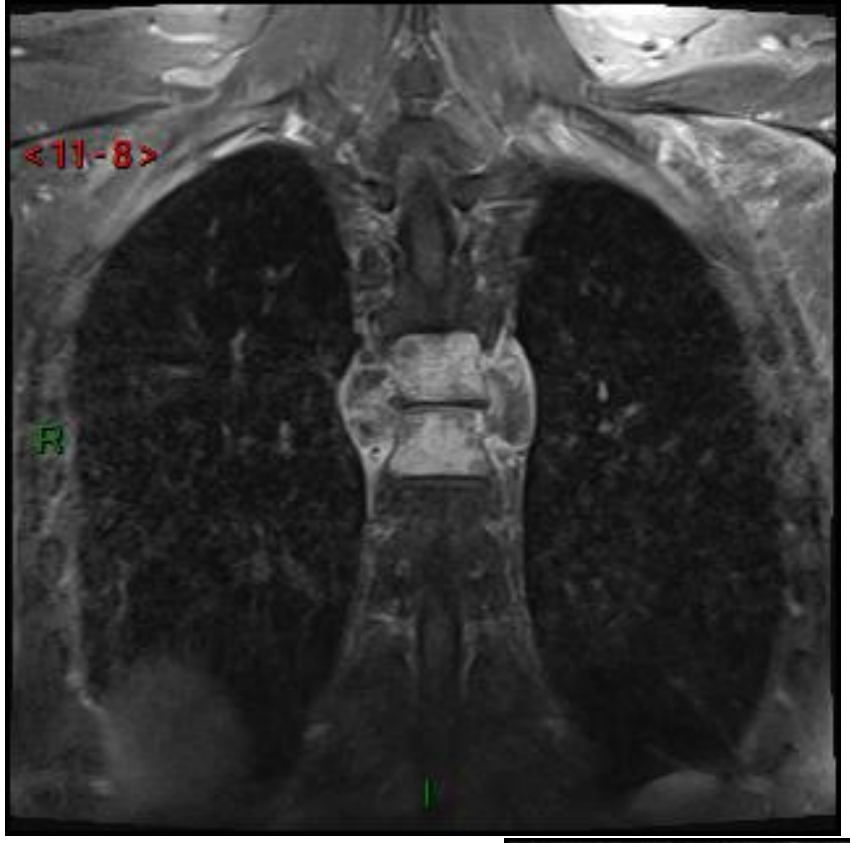
C10. Localize the abnormalities

C11 Which test do you recommend?

- 1. PET-CT
- 2. MR
- 3. PET-MR
- 4. CT
- 5. Chest US

C11 Which test do you recommend?

- 1. PET-CT
- 2. MR
- 3. PET-MR
- 4. CT
- 5. Chest US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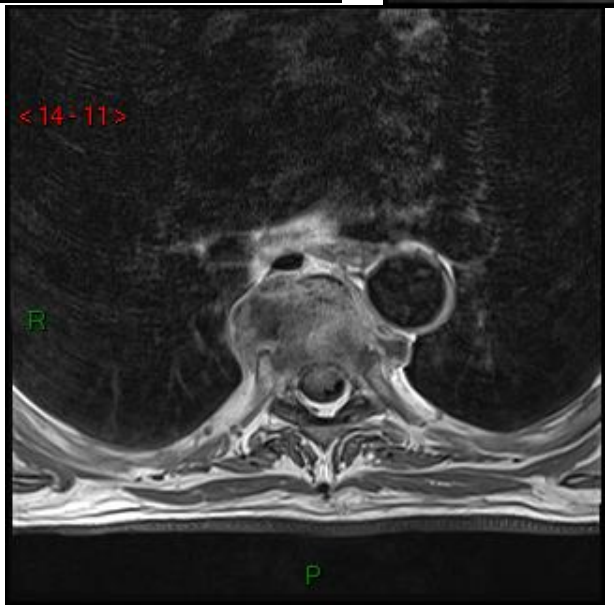
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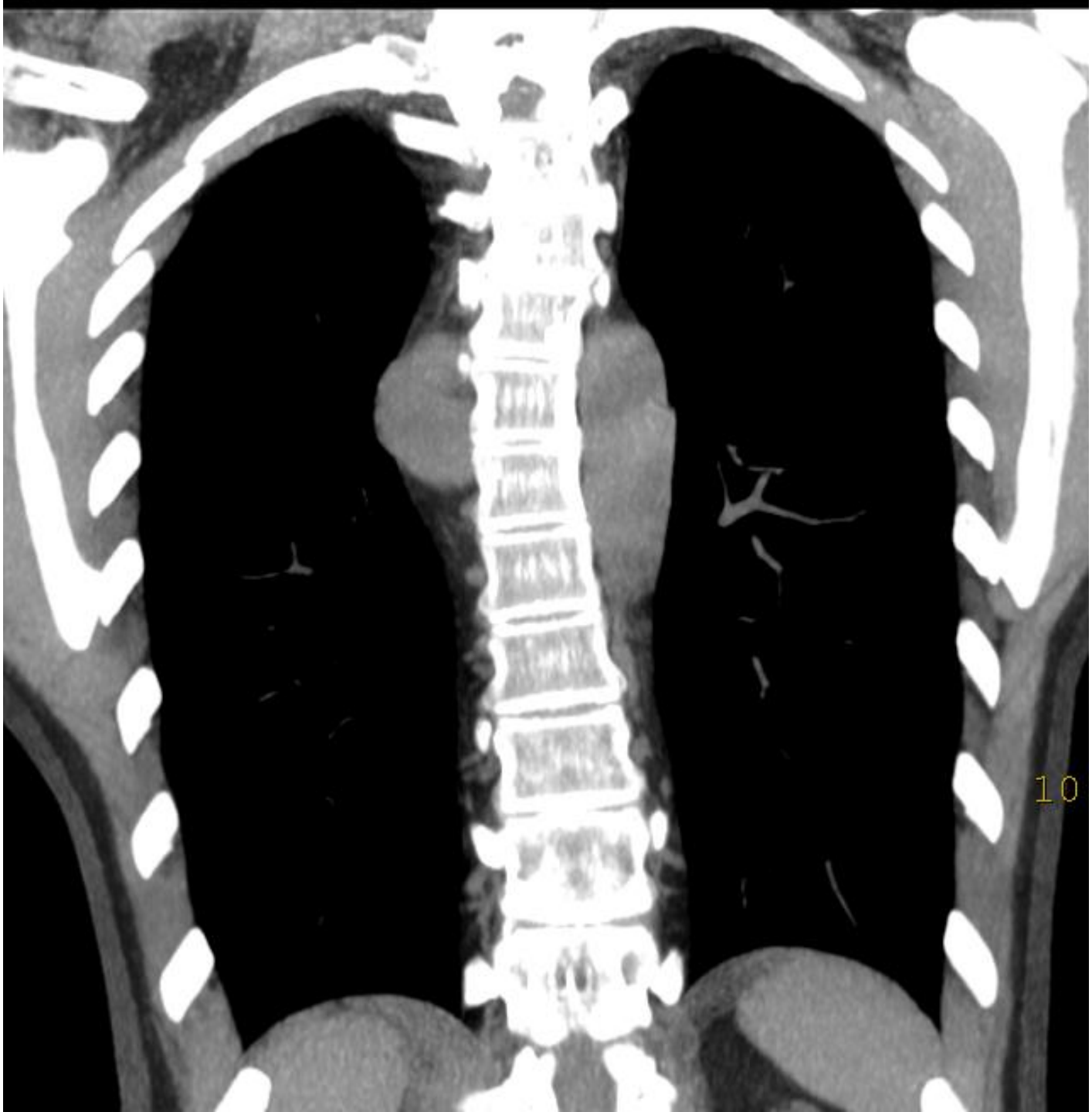
Case 7

- 45-year-old italian woman
- Chronic glomerular disease → renal graft in 1985
- In 1987: tubo-ovarian abcess
- March 2005: fall → chest X-ray
- Left rib fracture +…..
- Clinical examination:negative
- MDCT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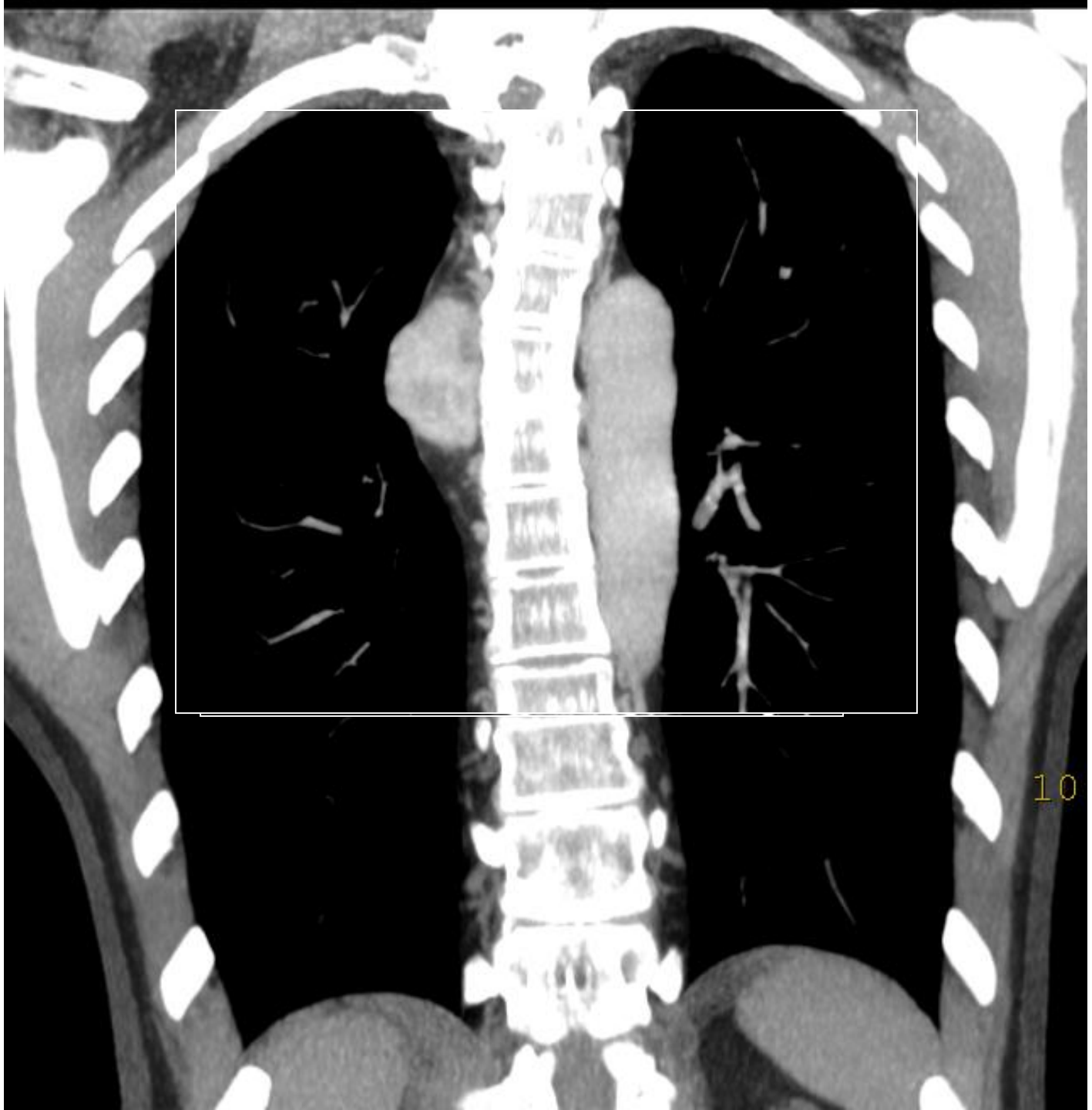
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C12. What is your diagnosis?

- 1. Bilateral paraganglioma
- 2. Paraspinal meningeal cysts
- 3. Bacillary angiomatosis
- 4. Bilateral neurofibroma
- 5. Pleural angiofibromatosis

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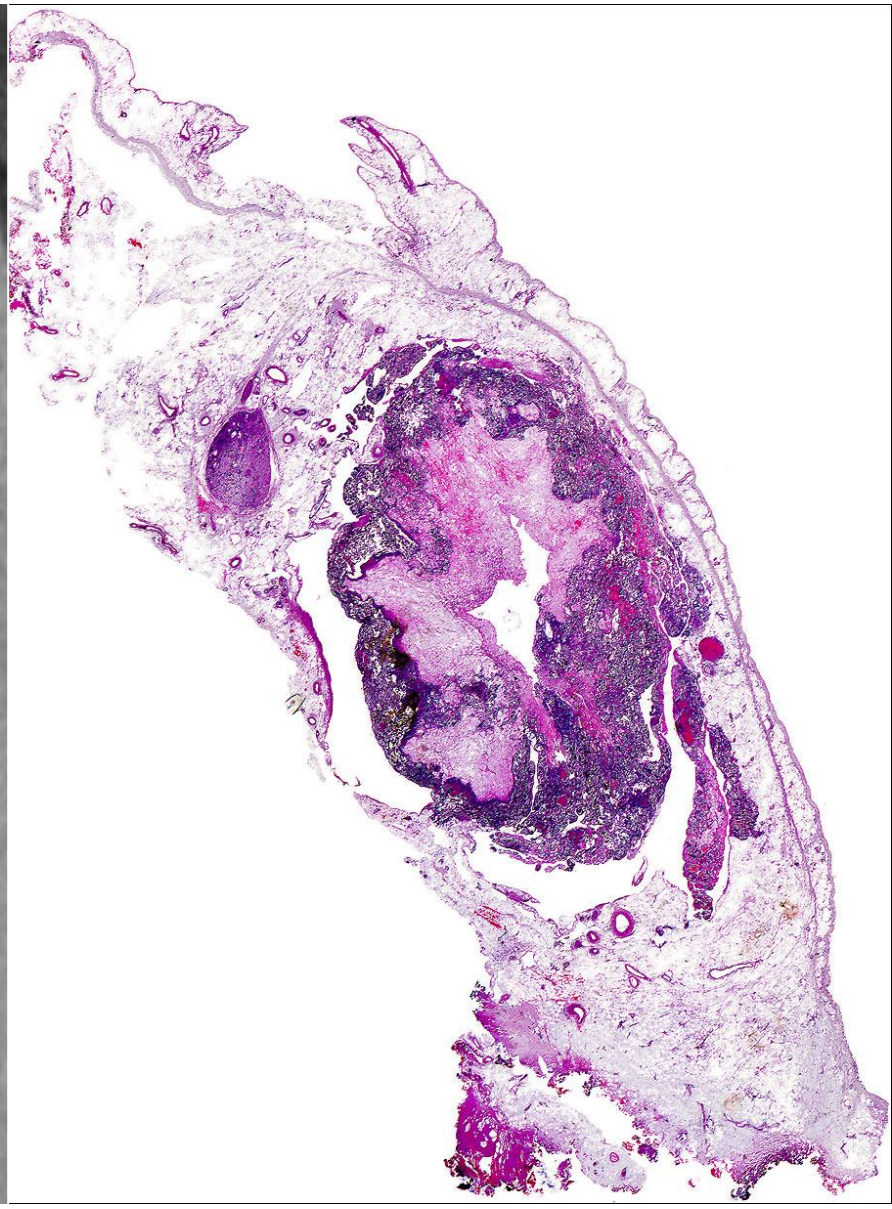
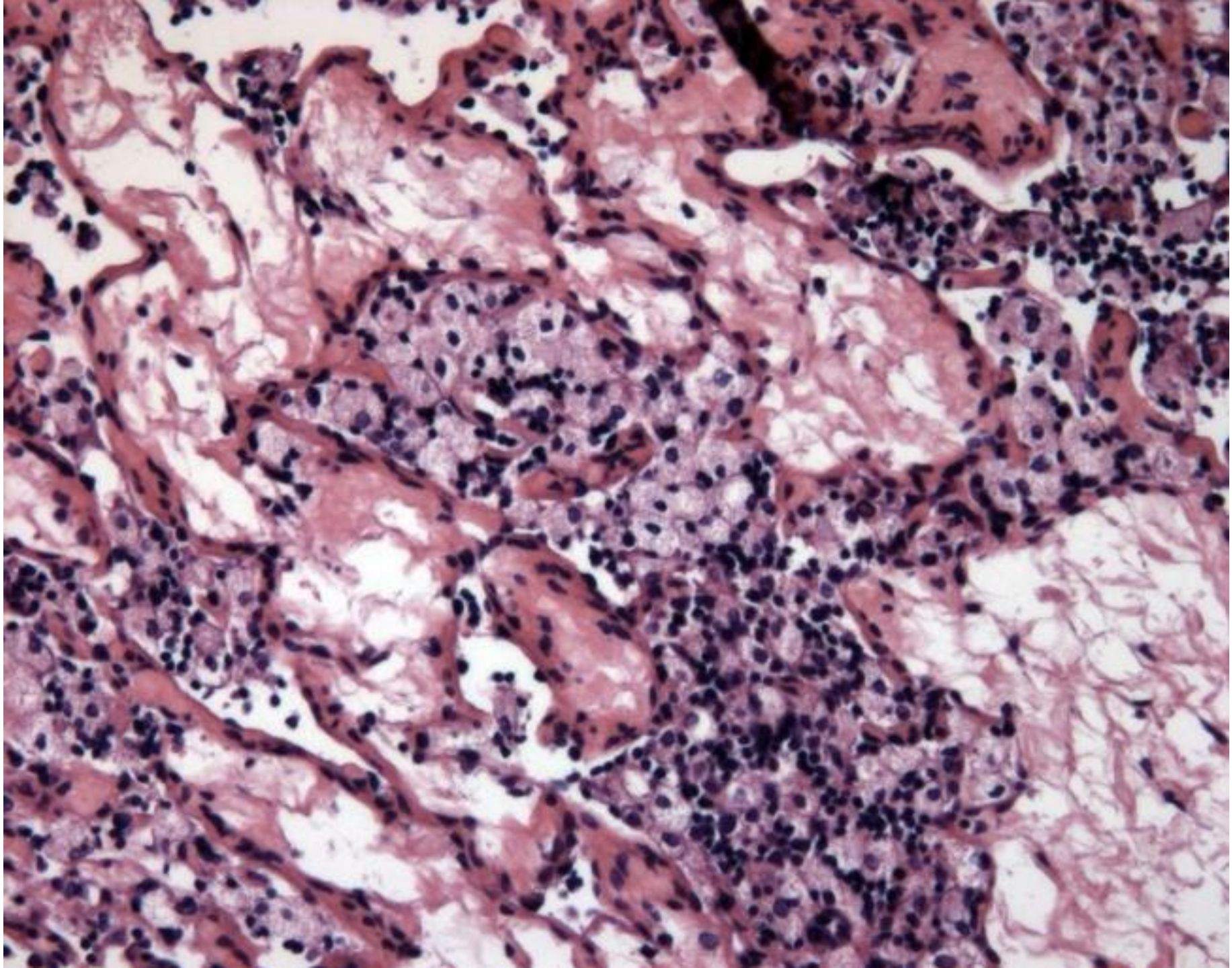
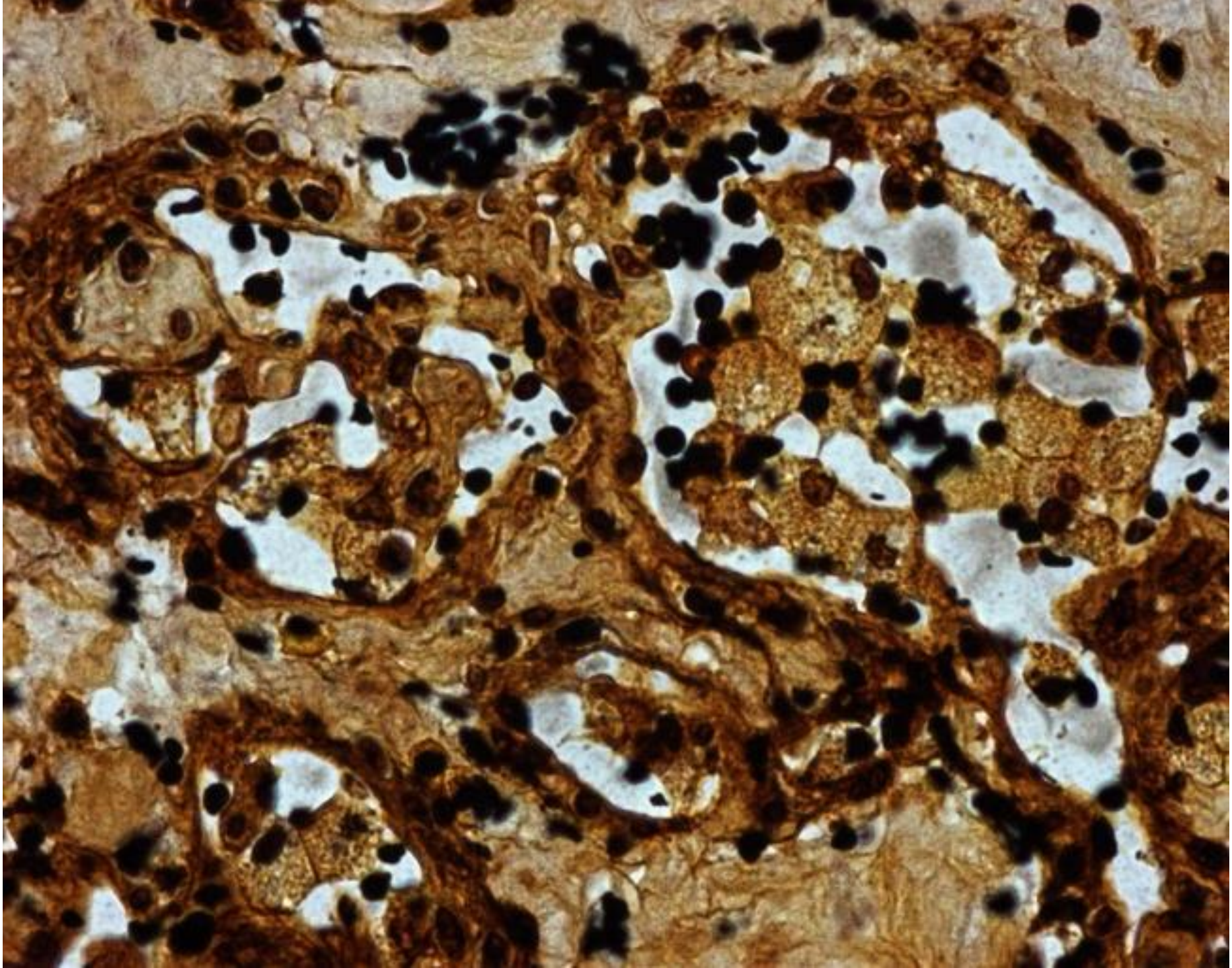






ELSEVIER

High Suspicion of Bacillary Angiomatosis in a Kidney Transplant Recipient: A Difficult Way to Diagnose—Case Report

S. Dardenne, E. Coche, B. Weynand, A. Poncelet, F. Zech, and M. De Meyer

ABSTRACT

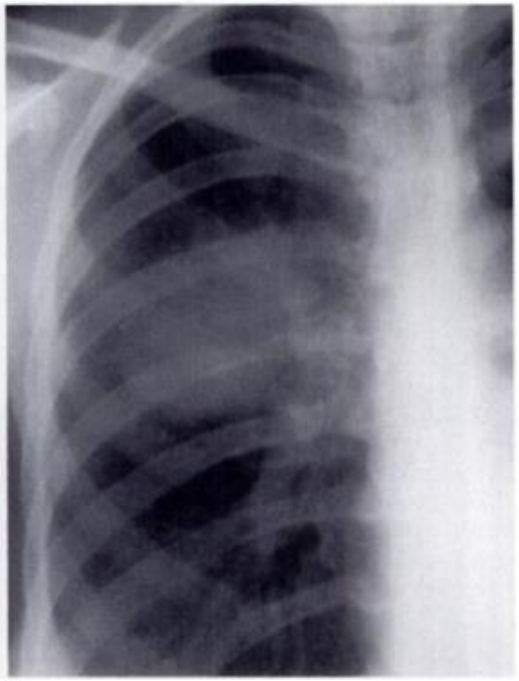
Bacillary angiomatosis is an infection caused by *Bartonella*, which has first been described in human immunodeficiency virus (HIV)–infected patients. We report an unusually located lesion, in a totally asymptomatic kidney transplant recipient. The diagnosis was strongly suggested based on the iconography and our histological analysis, but was not confirmed using polymerase chain reaction (PCR) and immunohistochemical studies. We illustrate our difficult way to the diagnosis as well as the course of the disease and our therapeutic strategy.

BACILLARY angiomatosis (BA) is an opportunistic infection caused by a gram-negative bacillus, that belongs to the genus *Bartonella.* Today, more than 15 species are characterized, but the most known sources of recognized *Bartonella* human disease are as follows[1–4]:

(1) *Bartonella bacilliformis,* first identified in the Andes Mountains region of Peru as the causative agent of Oroya fever (Carrión's Disease), a febrile hemolytic anemia in its acute form or verruga peruana in its chronic form. The infection vector is the sandfly;
(2) *Bartonella henselae,* transmitted by fleas, is the pathogenic agent of cat-scratch disease with lymphadenopathy and skin or visceral lesions; and
(3) *Bartonella quintana* is the pathogenic agent causing trench fever, described during the First World War, but now commonly diagnosed in homeless persons. The vector is the human body louse.

CASE REPORT

A forty-five-year-old woman underwent a first renal transplantation in 1983 and a second one in 1986 because of chronic glomerulonephritis. She never experienced acute renal rejection with her second kidney graft. Recently, she presented with a flu-like syndrome for a few days. During a hypotensive episode, she fell down. Because of parietal thoracic pain, a chest x-ray was performed and disclosed multiple rib fractures as well as an enlarged upper mediastinal region. Previous studies never showed any abnormality. Magnetic resonance imaging (Fig 1A) of the thoracic region revealed a highly vascularized, expanding lesion (20 × 30 × 40 mm) with thick walls and a necrotic center in the upper and posterior thorax. She was admitted for further investigations. The patient was completely asymptomatic. Her current therapy included cyclosporine, azathioprine, and methylprednisolone. Physical examination did not indicate weight loss. Cardiopulmonary and abdominal examinations were normal. No adenopathy was found, and no skin lesion was found except verruga vulgaris. Laboratory analysis results were in the normal range. All oncologic markers



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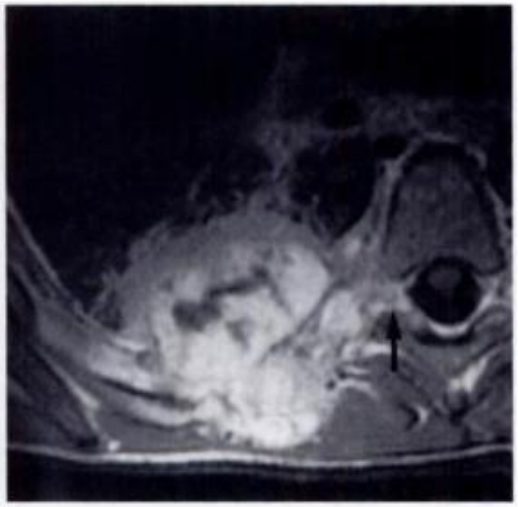

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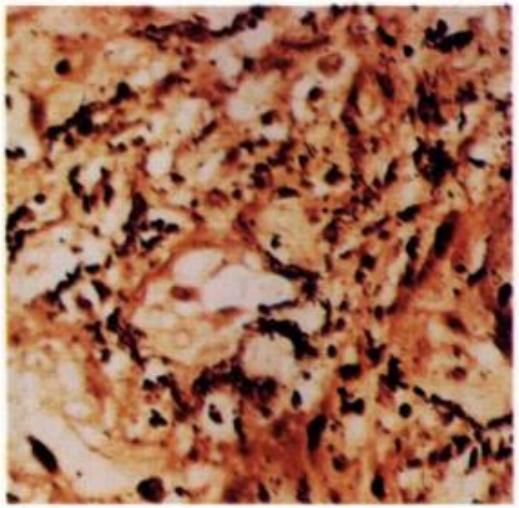

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Fig. 1.—26-year-old woman with AIDS who had pain in right hemithorax, low-grade fever, and weight loss.

A, Chest radiograph shows right-sided thoracic mass with contiguous rib erosion.

B, Chest CT scan after dynamic injection of contrast material shows mass in lower right portion of thorax that appears hypervascular with heterogeneous enhancement and central hypodense area. Small pleural effusion is present, and mass is seen to involve intercostal space and posterior thoracic wall.

C, CT scan of 1.5-mm collimation at bone window setting did not show any calcification within mass. Note bronchus arriving into parenchymatous mass.

D, T1-weighted spin-echo MR image obtained after injection of contrast material shows that mass involves sixth right dorsal foramen (*arrow*) without any epidural involvement.

E, Photomicrograph of bacillary angiomatosis lesion reveals clusters of bacilli in interstitium (Warthin-Starry stain, original magnification ×200).