Basic Data

- Sex：Male
- 31 years old
- Occupation: 搬家工人

Chief Complaint

- Intermittent chest pain with shortness of breath for 2-3 months.

Present Illness

- 4 months ago, he started having occasional chest pain and shortness of breath and had been to ER of TSGH for evaluation. But the symptoms always relieved soon at ER and he was discharged without diagnosis.
- However, he still sometimes has chest pain episodes when moving heavy furniture. The pain was sharp and localized at right upper sternal area without radiation.
- He went to chest OPD of TSGH again, the CXR showed a well-defined mediastinal mass protruded to right lung field from mediastinum.
- Chest CT revealed a homogenous tumor at right anterior mediastinum around SVC and ascending aorta.
- Thymoma was suspected by TSGH physician.

Present Illness

- He came to our chest OPD for second opinion.
- CT-guide biopsy performed on 95-10-04. The pathologic report showed that it’s a benign cyst.
- Throughout the course, he has no fever, cough, body weight loss, or symptoms of myasthenia gravis.
- He was admitted for surgical intervention on 95.11.07.

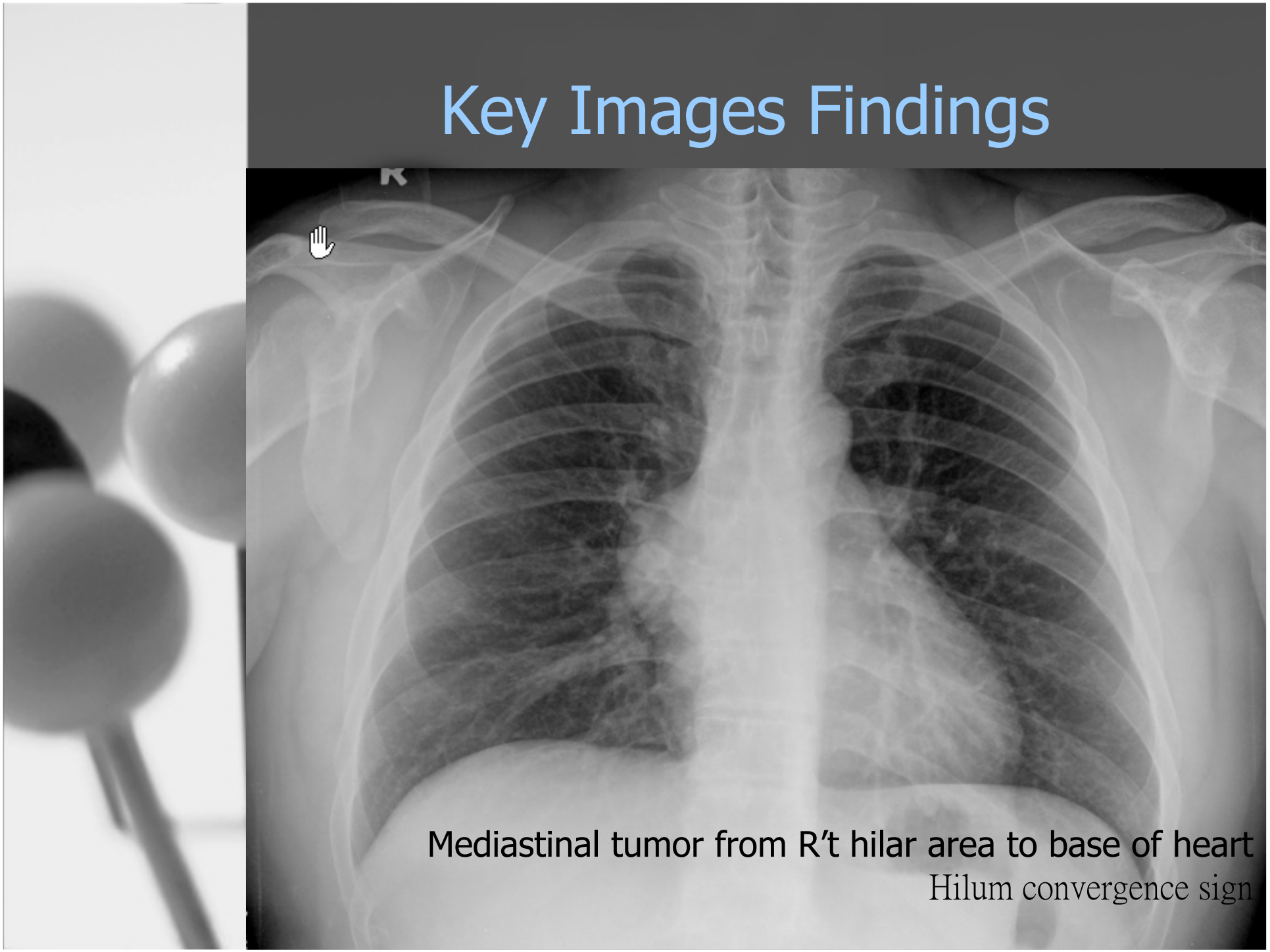
Past and Personal History

- Unremarkable

Lab Findings

- WBC = 12010
- Others : Unremarkable
- EKG: II, III, AVF q waves
- Cadioecho: EF 83%, mild AR,MR
- PFT: Spirometry is within normal limits.

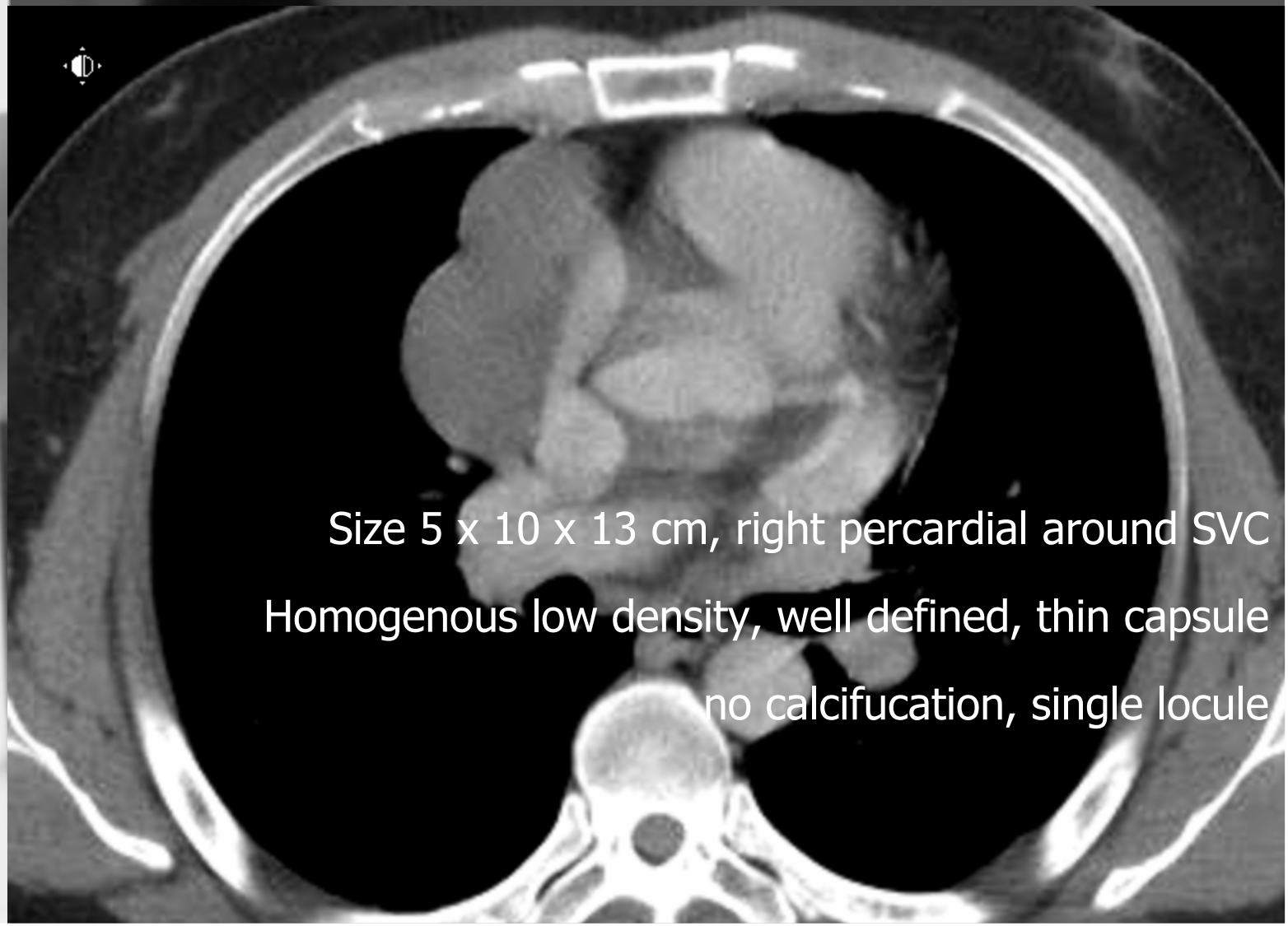
Key Images Findings



Mediastinal tumor from R't hilar area to base of heart

Hilum convergence sign

Key Images Findings

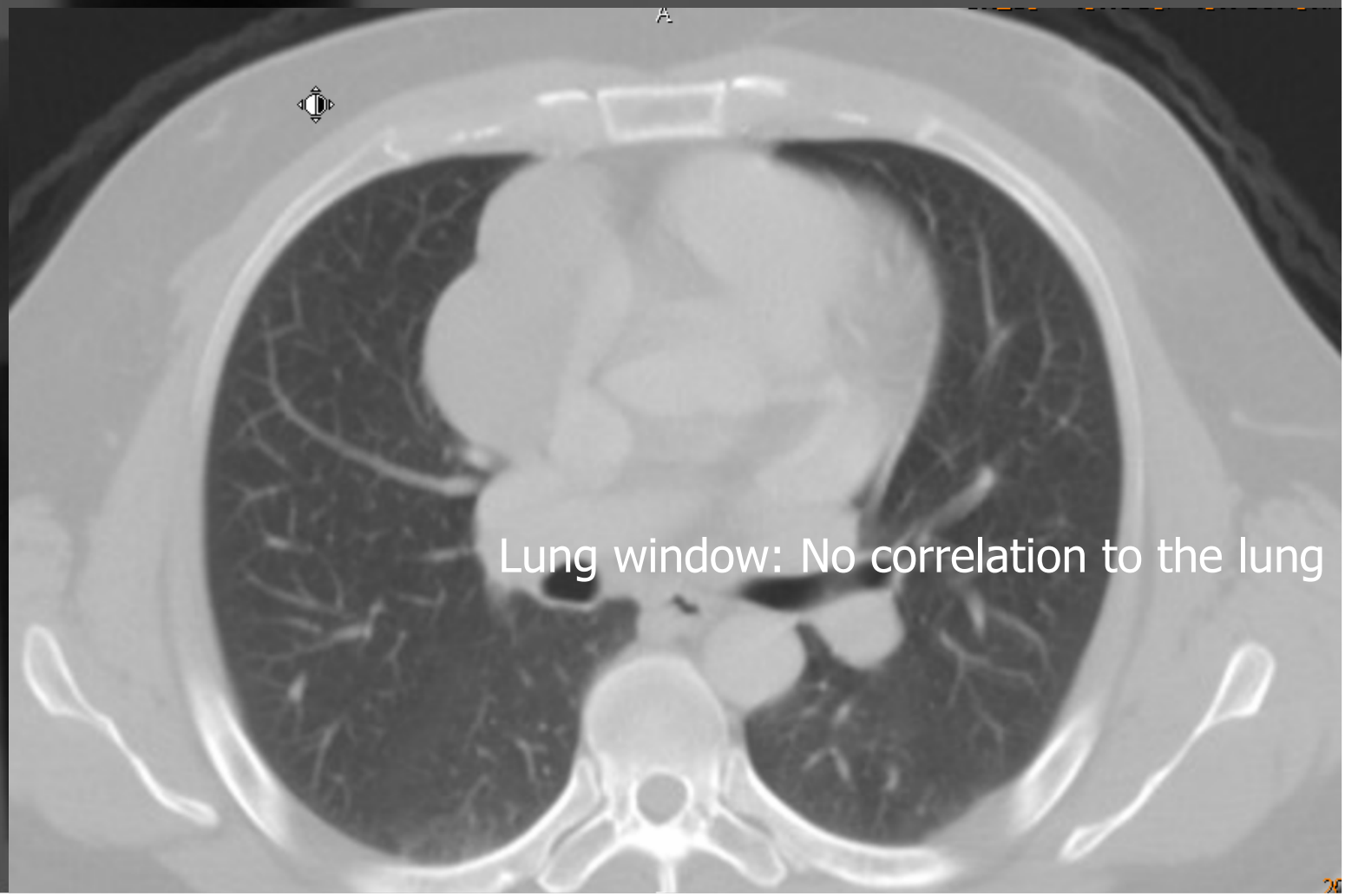


Size 5 x 10 x 13 cm, right percardial around SVC

Homogenous low density, well defined, thin capsule

no calcifucation, single locule

Key Images Findings



Lung window: No correlation to the lung

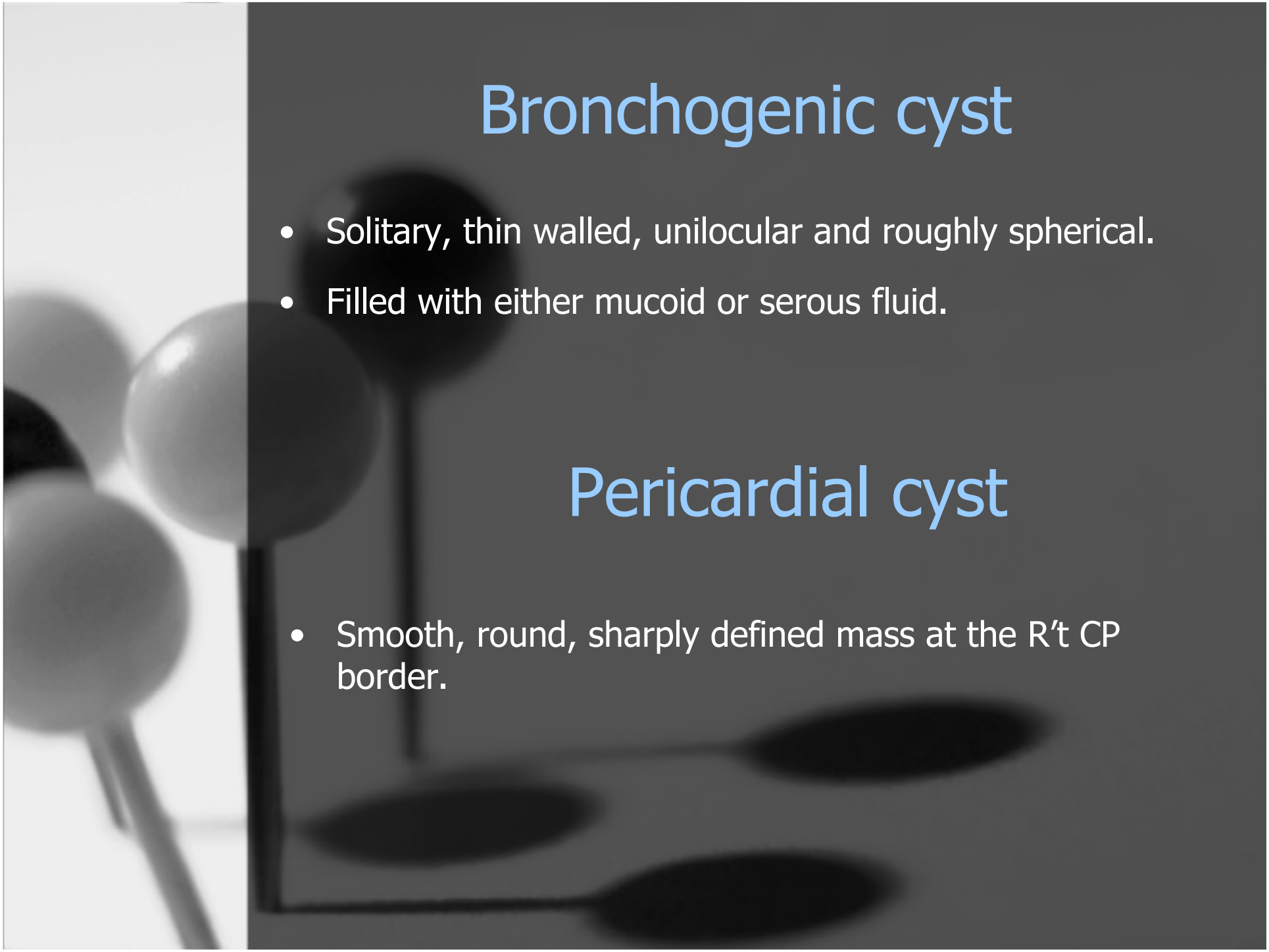
Differential Diagnosis

- Ant. Mediastinal cyst / mass
  - Thymic
  - Thyroid
  - Teratoid
- Middle mediastinal cyst / mass
  - Bronchogenic cyst
  - Pericardial cyst

Thymic cyst

- Solid, smoothly
- Congenital：unilocular
  Acquired：multilocular
- Unilocular：thin wall & contain serous fluid

  Multilocular：thick wall & pericystic fibrous adhesions and have thick, hemorrhagic, "cheesy," or turbid contents.



Bronchogenic cyst

- Solitary, thin walled, unilocular and roughly spherical.
- Filled with either mucoid or serous fluid.

Pericardial cyst

- Smooth, round, sharply defined mass at the R't CP border.

Surgical Intervention

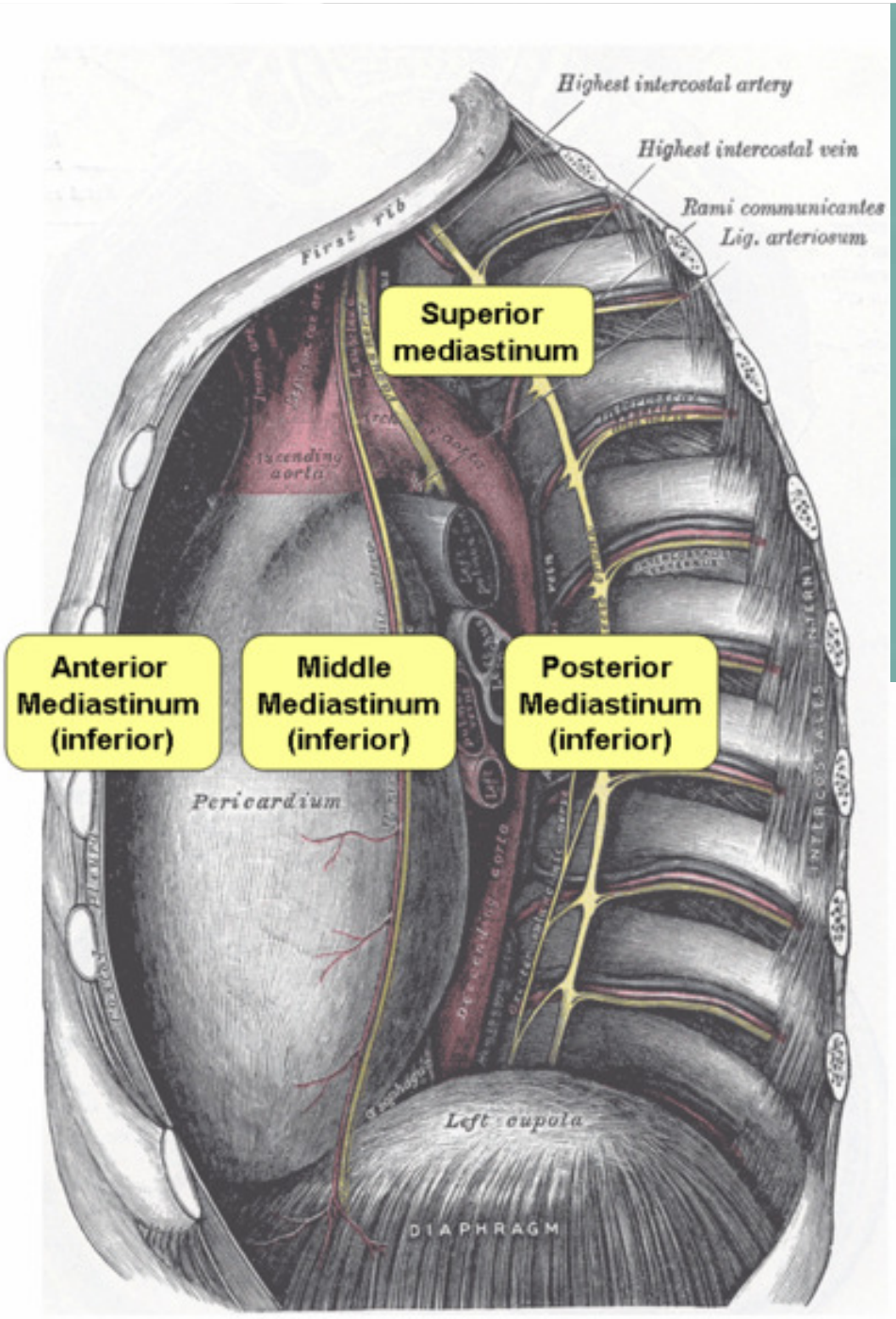
- 95.11.09
  Exploratory thoracotomy R't+
  Removal of mediastinal tumor+
  Pneumolysis
- Surgical findings:
  A large cyst with bloody containing fluid
  No local invasion
  No SVC compression

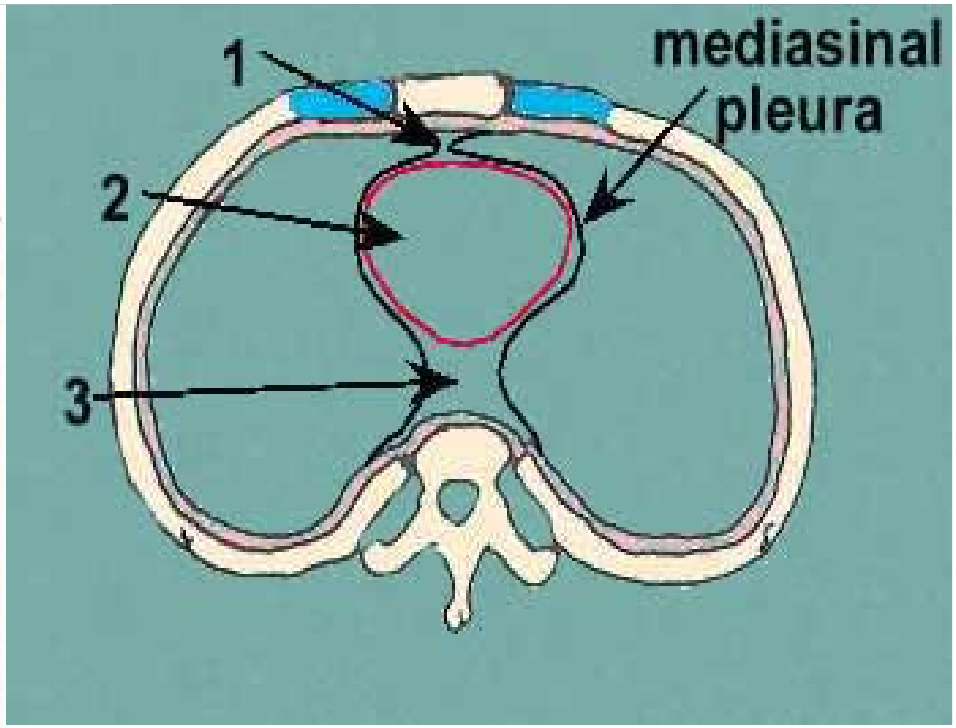
Final pathology

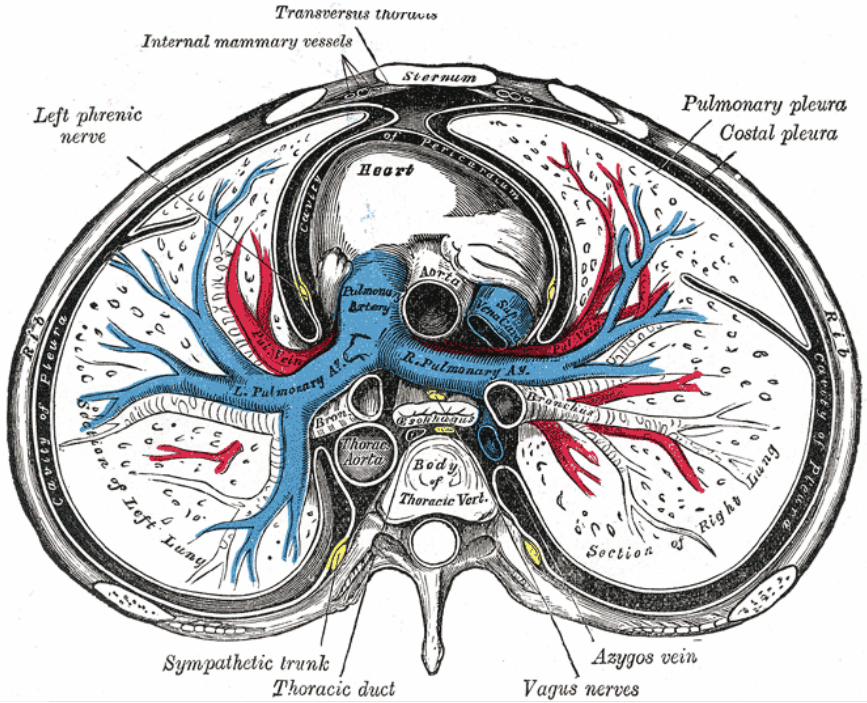
- Benign hemorrhagic cystic lesion
- Two layer capsule with no epithelium lining.

Discussion

- Anatomy of mediastinum
- Introduction of mediastinal cysts
- The most 3 possible mediastinal cysts in this case
- Pathophysiology
- How to Dx (Modalities)
- Treatment
- Prognosis

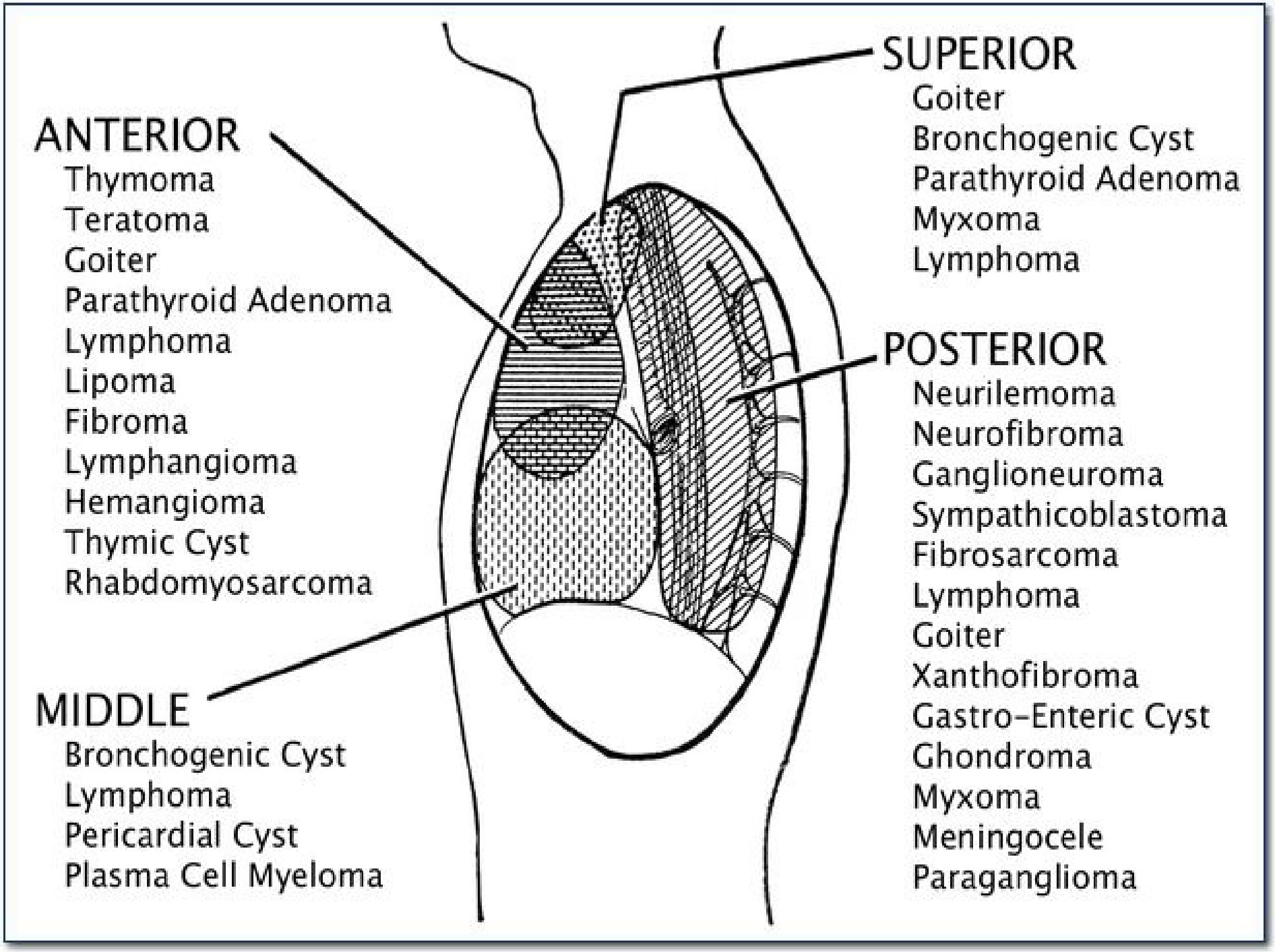

Highest intercostal artery
Highest intercostal vein
Rami communicantes
Lig. arteriosum
First rib
Superior mediastinum
Anterior Mediastinum (inferior)
Middle Mediastinum (inferior)
Posterior Mediastinum (inferior)
Pericardium
Left cupola
DIAPHRAGM

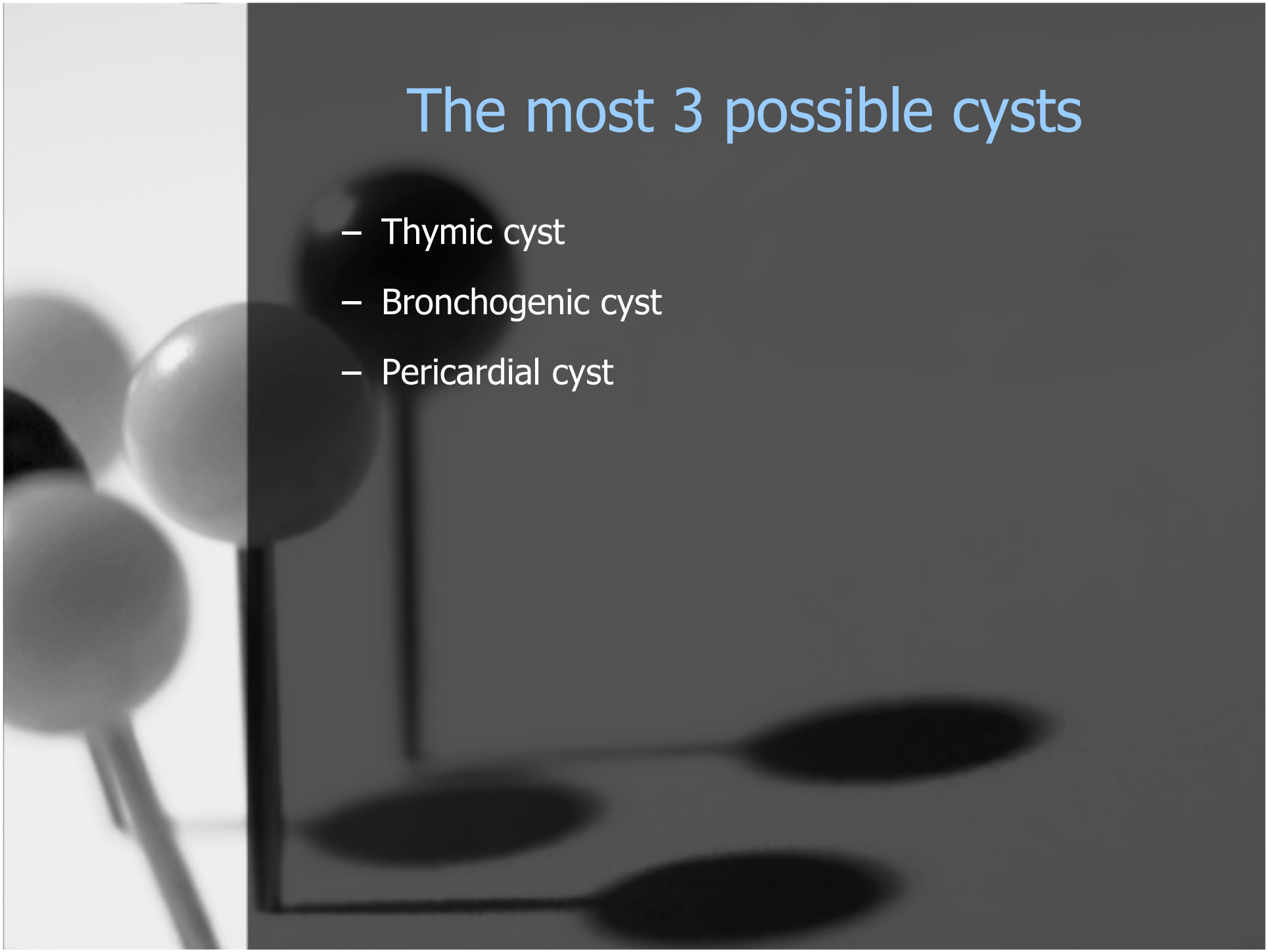

1
2
3
mediasinal pleura


Transversus thoracis
Internal mammary vessels
Sternum
Left phrenic nerve
Pulmonary pleura
Costal pleura
Heart
Pulmonary Artery
Aorta
L. Pulmonary Art.
R. Pulmonary Art.
Bronchus
Oesophagus
Thoracic Aorta
Body of Thoracic Vert.
Cavity of Pleura
Rib
Root of Left Lung
Section of Right Lung
Sympathetic trunk
Thoracic duct
Azygos vein
Vagus nerves

Introduction of mediastinal cysts

- Ant. mediastinum :
  -Thymic
  -Lymphatic
  -Bronchogenic cyst
  -Thyroid
  -Germ cell origin
- Middle mediastinum :
  -Lymphatic origin
  -Neurogenic tumors
  -Cystic structures → primitive foregut or the precursors of the pericardium or pleura.
    *Bronchogenic
    *Gastric
    *Neurenteric
    *Esophageal
    *Pleuropericardial
    *Gastroenteric cysts
- Posterior mediastinum
  -Neurogenic tumors
  -Vascular
  -Bronchogenic cyst
  -Lymphatic
  -Mesenchymal tissues


SUPERIOR
Goiter
Bronchogenic Cyst
Parathyroid Adenoma
Myxoma
Lymphoma
ANTERIOR
Thymoma
Teratoma
Goiter
Parathyroid Adenoma
Lymphoma
Lipoma
Fibroma
Lymphangioma
Hemangioma
Thymic Cyst
Rhabdomyosarcoma
POSTERIOR
Neurilemoma
Neurofibroma
Ganglioneuroma
Sympathicoblastoma
Fibrosarcoma
Lymphoma
Goiter
Xanthofibroma
Gastro-Enteric Cyst
Ghondroma
Myxoma
Meningocele
Paraganglioma
MIDDLE
Bronchogenic Cyst
Lymphoma
Pericardial Cyst
Plasma Cell Myeloma



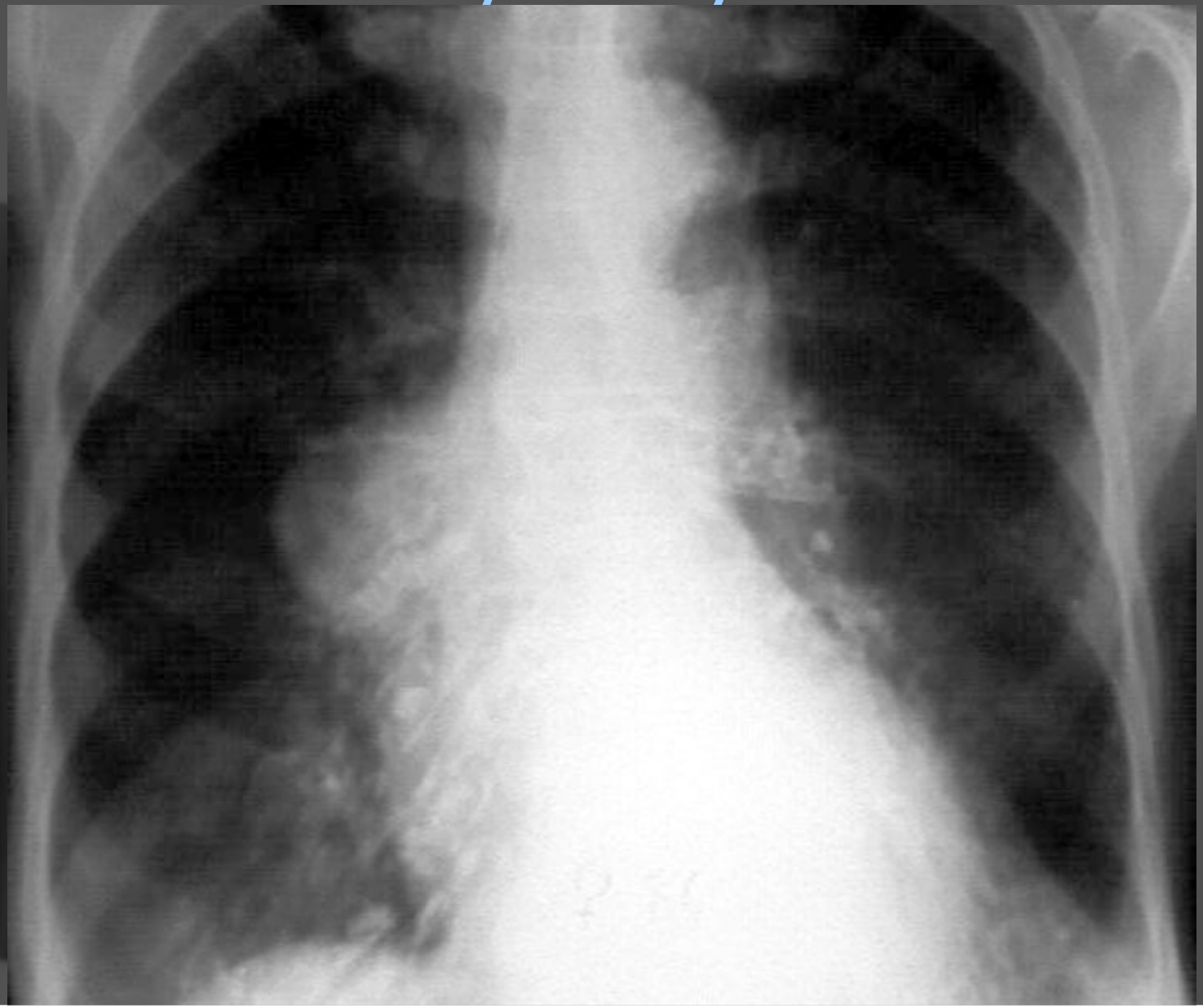
The most 3 possible cysts

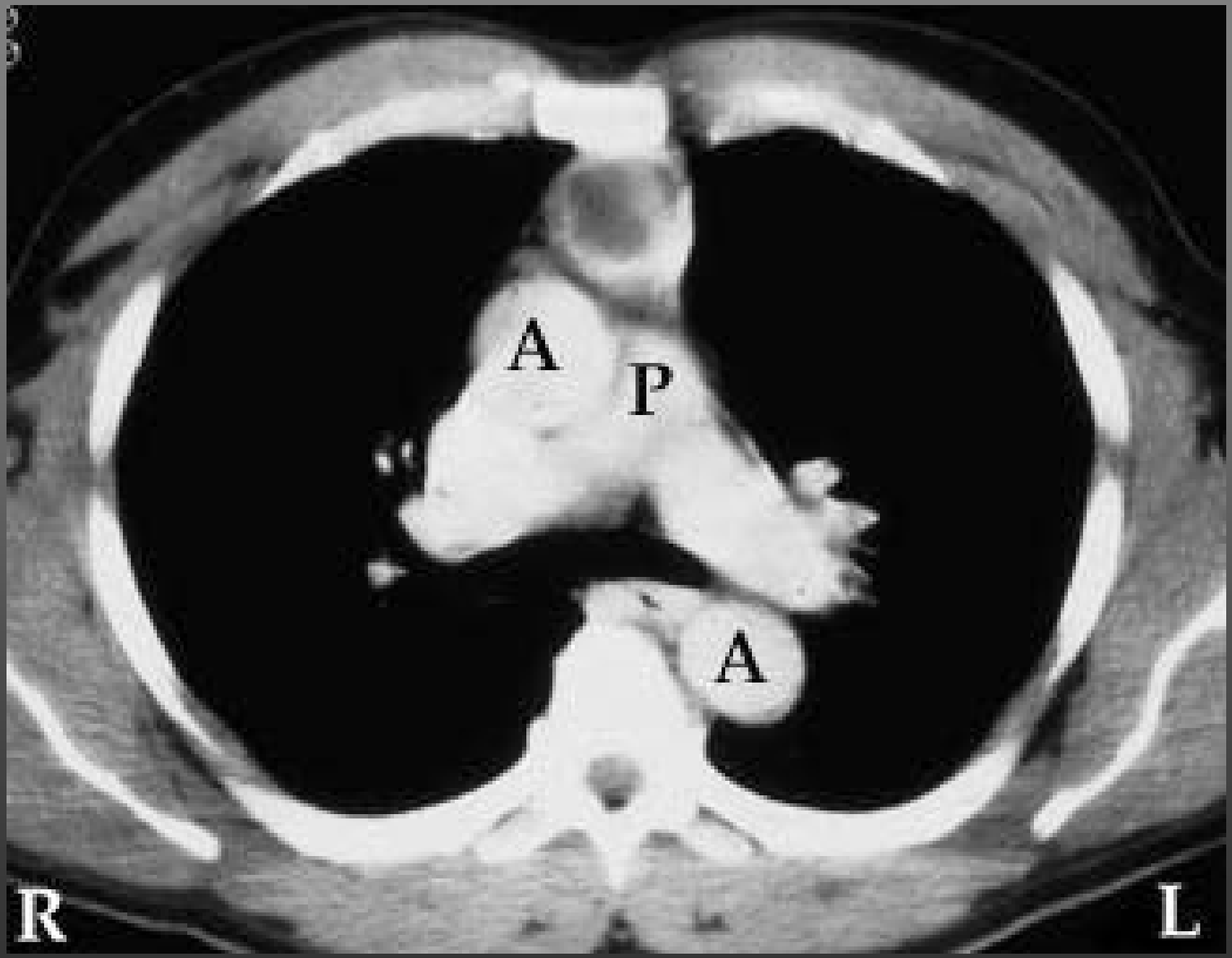
- Thymic cyst
- Bronchogenic cyst
- Pericardial cyst

Thymic cyst

- Derived from the 3rd & 4th pharyngeal pouches
- Typically located in the anterosuperior mediastinum or low neck.
- Asymptomatic
- Unilocular : lined by a bland squamous monolayer
- Multilocular : multilayered squamous epithelium + other epithelial types + and a thick fibrous wall, which may contain cholesterol granulomas, hemorrhage or granulation tissue.

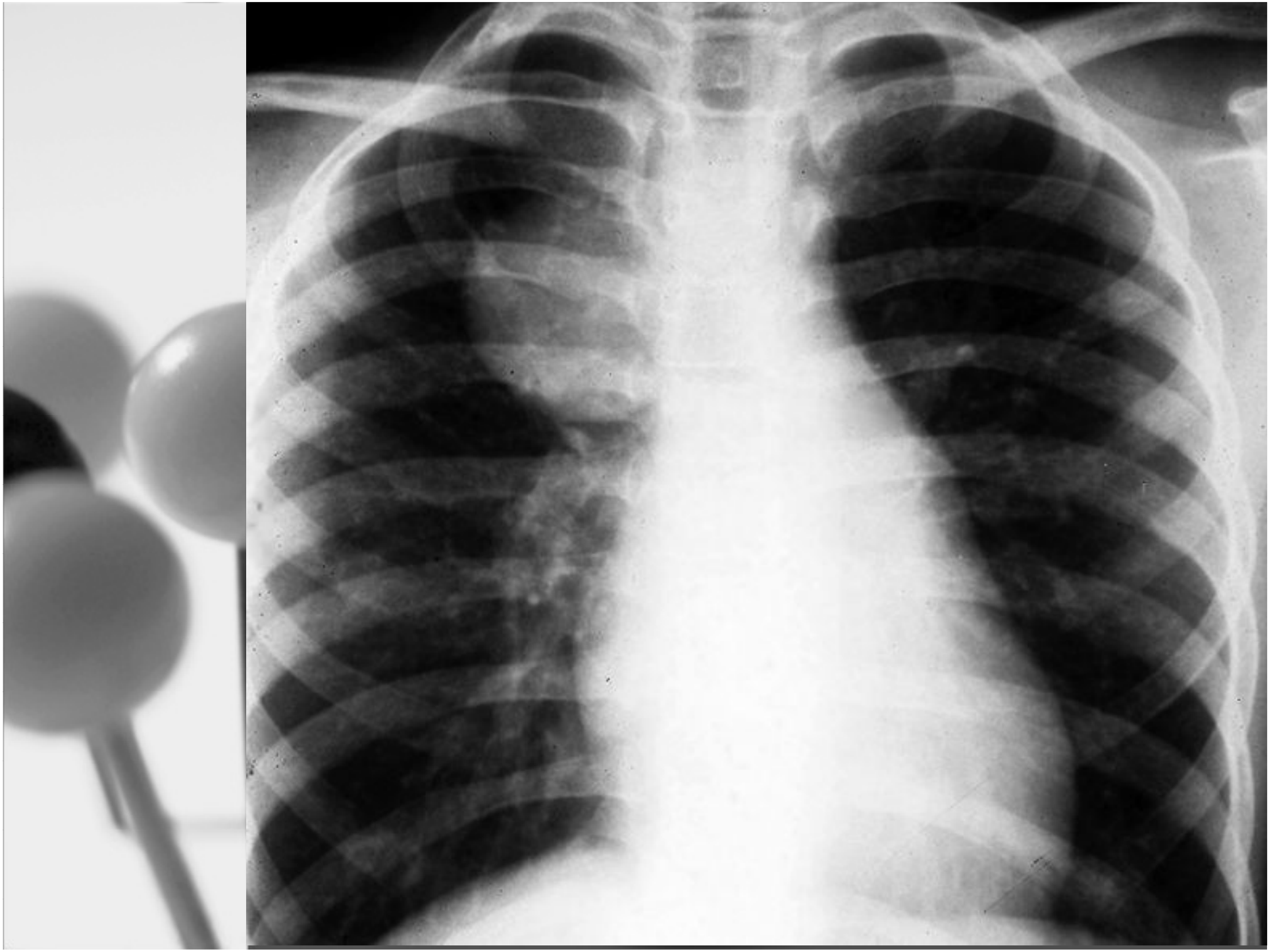
Thymic cyst

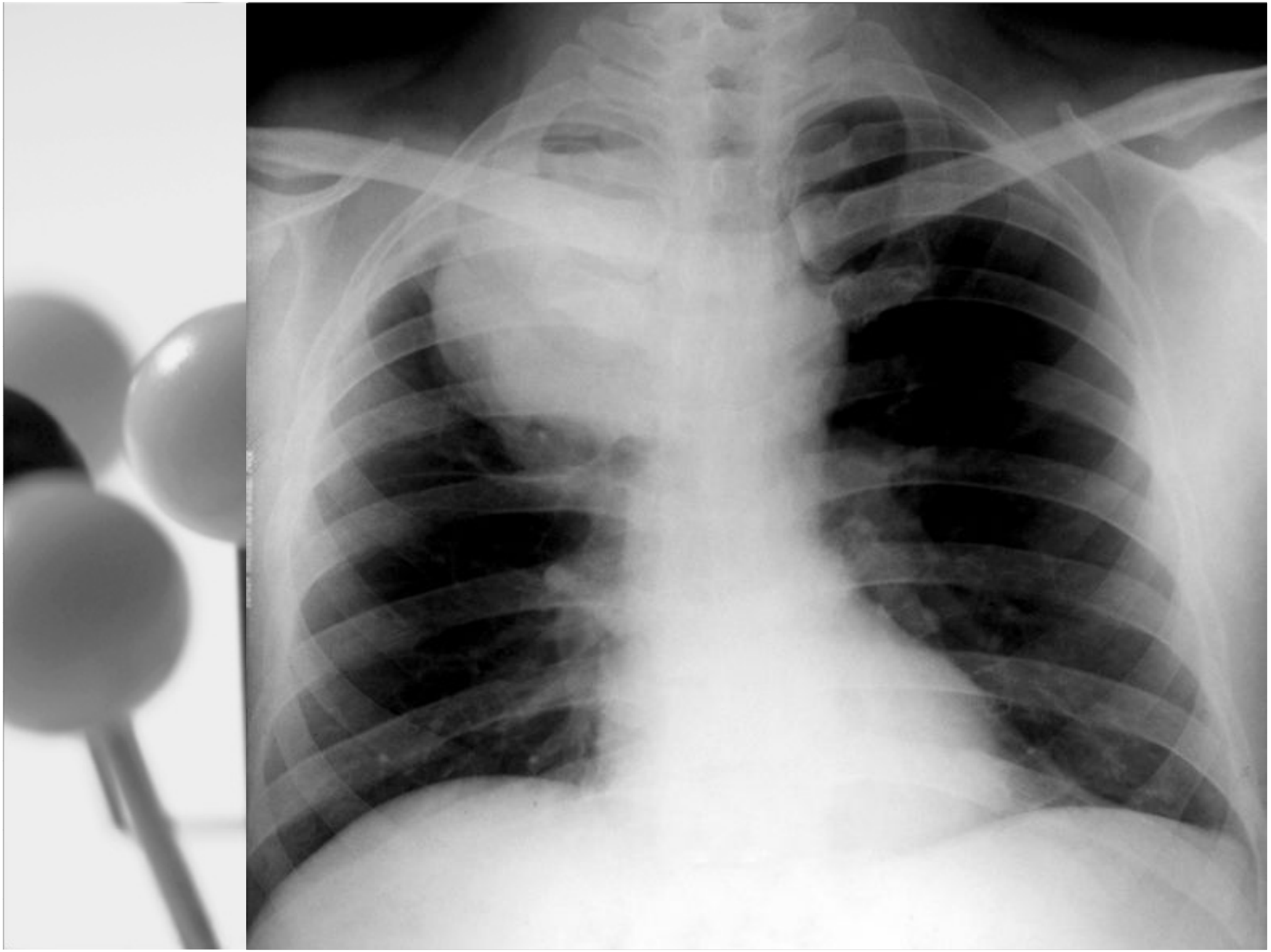



A
P
A
R
L

Bronchogenic cyst

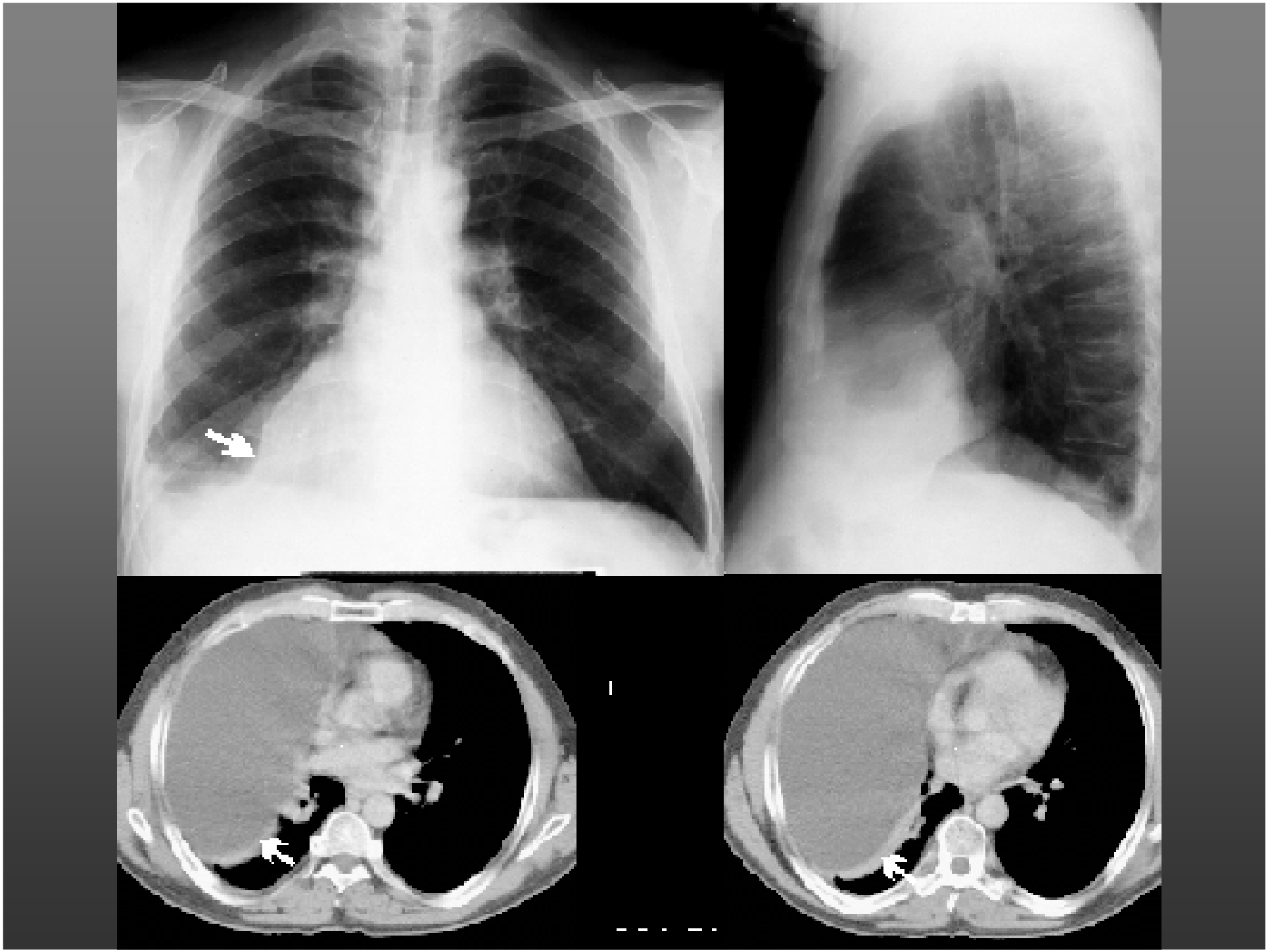
- Majority at the carina or adjacent to the pericardium between the root of the aorta and the superior vena cava.
- Do not communicate with the rest of the tracheobronchial tree.
- CXR： solitary clearly defined, homogeneous, inferior to the carina, protruding slightly to the right, overlapping but not obscuring the hilar shadow.
- Calcification：uncommon.
- Respiratory-type pseudostratified columnar epithelium with cilia, and foci of mature cartilage.

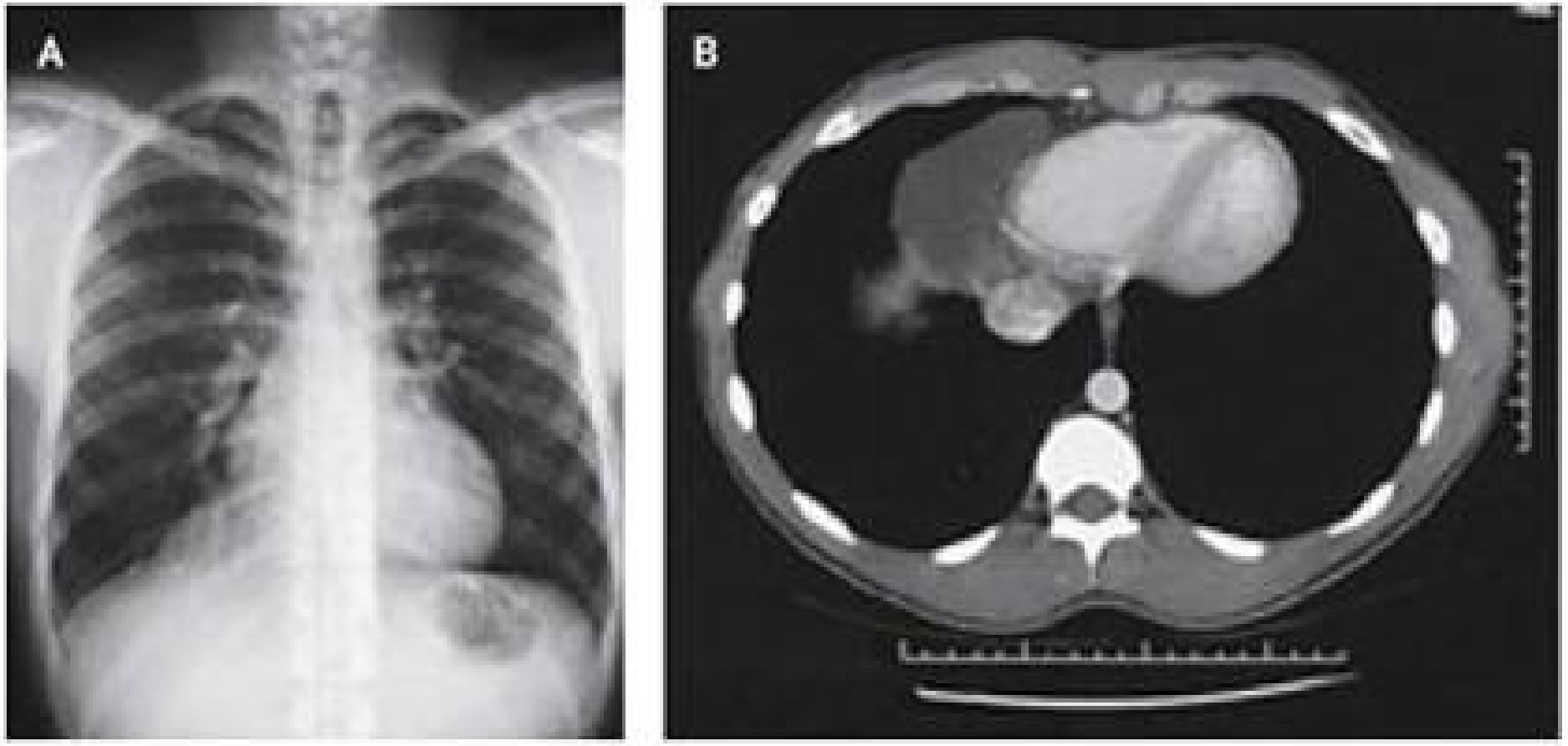




Pericardial cyst

- Asymptomatic, congenital, rare fluid filled
- A lower attenuation than the proteinaceous fluid in the bronchogenic cysts.
- Macroscopically：thin fibrous wall and contain serous fluid.
- Microscopic：thin fibrous wall lined by a monolayer of mesothelium.
- The cysts may vary slightly in size over time but as most patients remain asymptomatic, they may be managed conservatively.




A
B

Pathophysiology

- Local ：
  - Compression or obstruction: Airway, esophagus, or the right heart and great veins
  - Infection
  - Rarely causing superior vena cava syndrome or pulmonary artery compression.
- Systemic
  - Foregut and other cysts of the mediastinum generate no bioactive substances that produce systemic effects.
  - Almost related to infection.

Workup

- Chest radiography
- Esophagram
- CT scan of the chest and mediastinum
- Magnetic resonance imaging
- Radionuclide scanning
- Echocardiography and ultrasonography
- Arteriography

Chest radiography

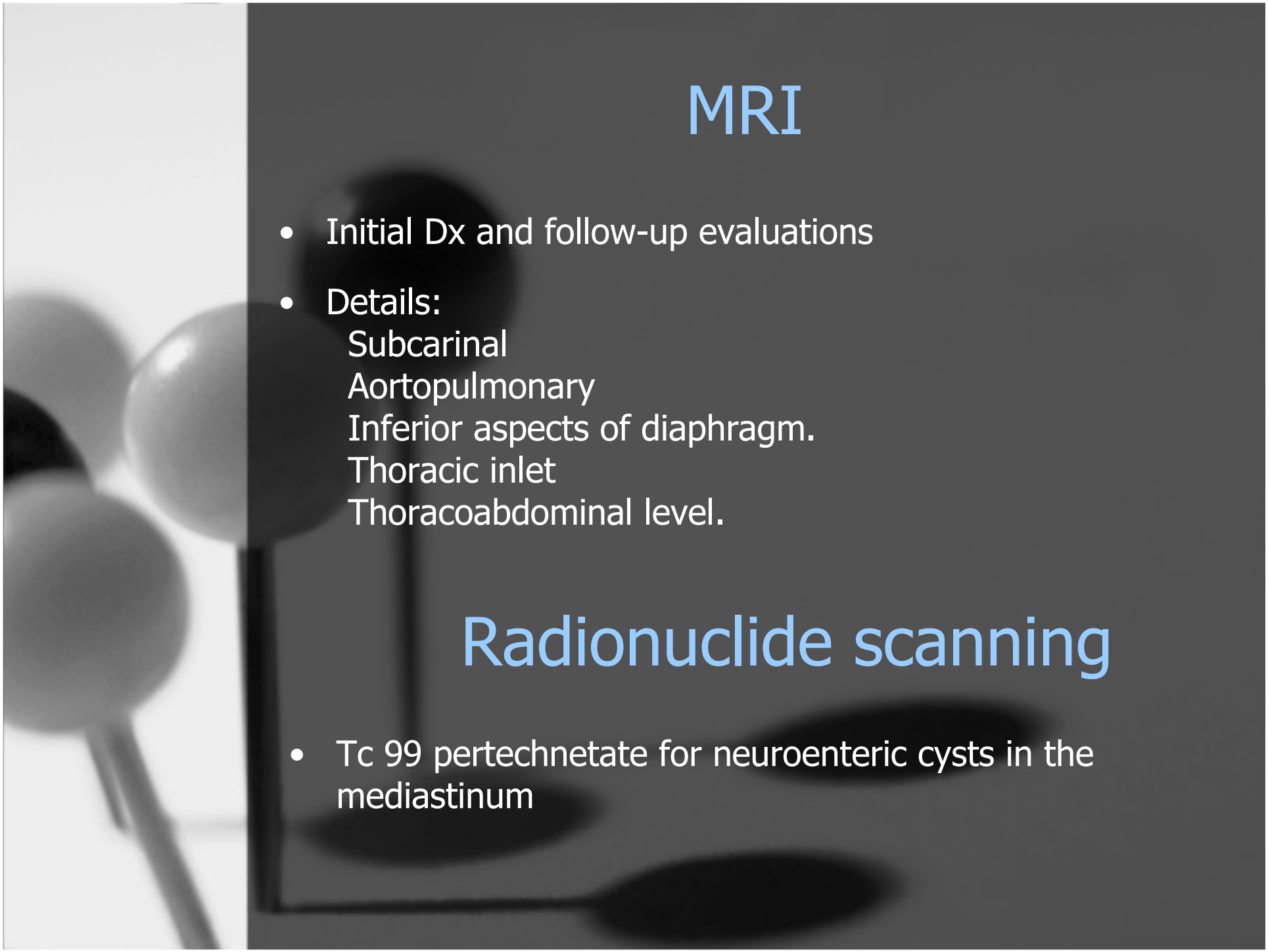
- Lateral view:
  - Very helpful in determining the involved compartment of the mediastinum.
  - Combined with the age, sex, and associated clinical findings, aids the physician in the proper choice of subsequent diagnostic studies.
- Air-fluid level：communicate with tracheobronchial tree
- Foregut cyst：fully filled with fluid → mediastinal mass

Esophagram

- Replaced by CT scan
- Barium esophagram : symptoms of dysphagia

CT scan

- Exact location and relationship to adjacent structures.
- Differentiating mass origin, tissue densities,
- Differentiating: cystic, vascular or solid.
- Replaced barium esophagram in infants and children.

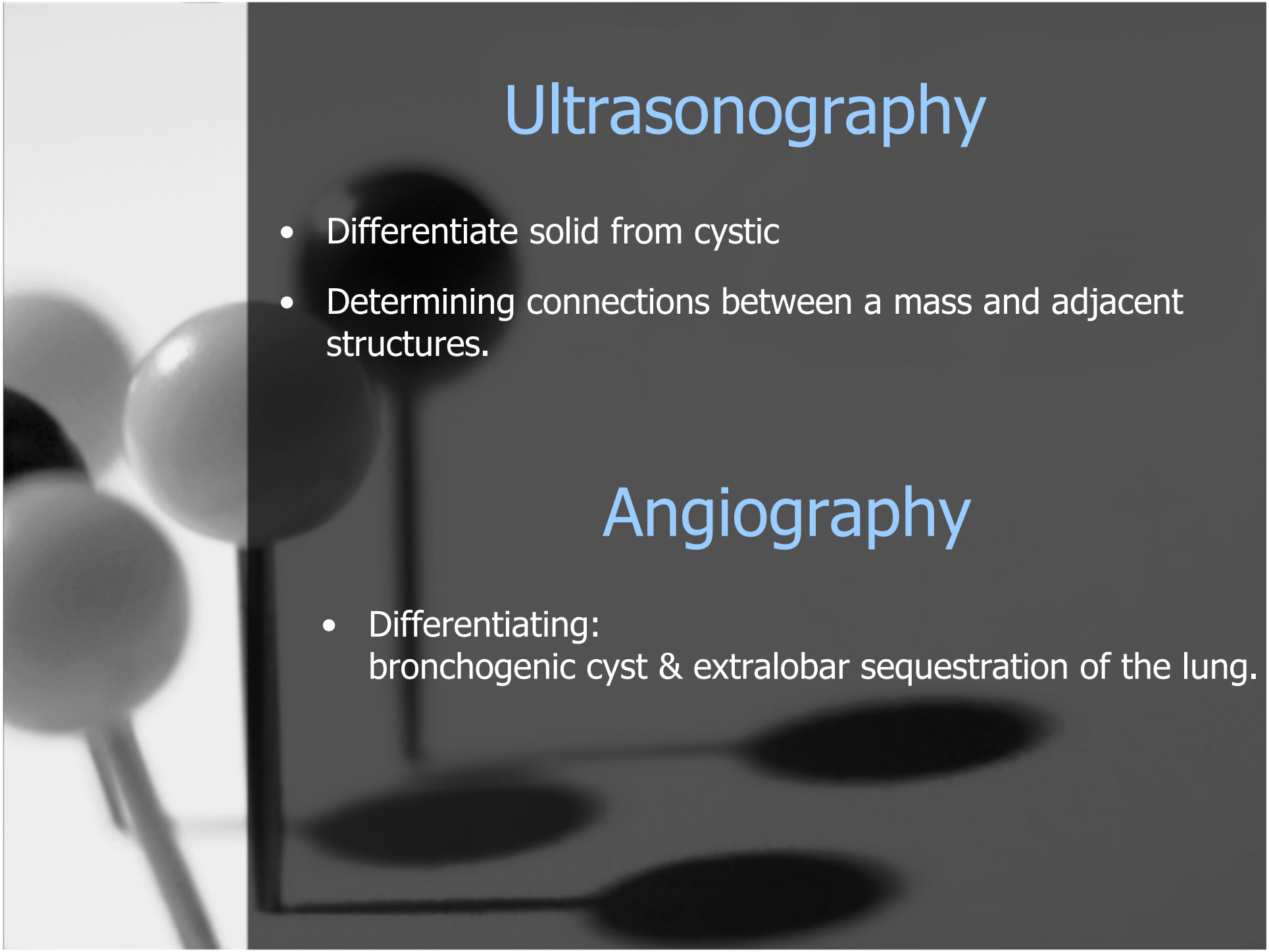


MRI

- Initial Dx and follow-up evaluations
- Details:
  Subcarinal
  Aortopulmonary
  Inferior aspects of diaphragm.
  Thoracic inlet
  Thoracoabdominal level.

Radionuclide scanning

- Tc 99 pertechnetate for neuroenteric cysts in the mediastinum



Ultrasonography

- Differentiate solid from cystic
- Determining connections between a mass and adjacent structures.

Angiography

- Differentiating:
  bronchogenic cyst & extralobar sequestration of the lung.

Diagnostic Procedures

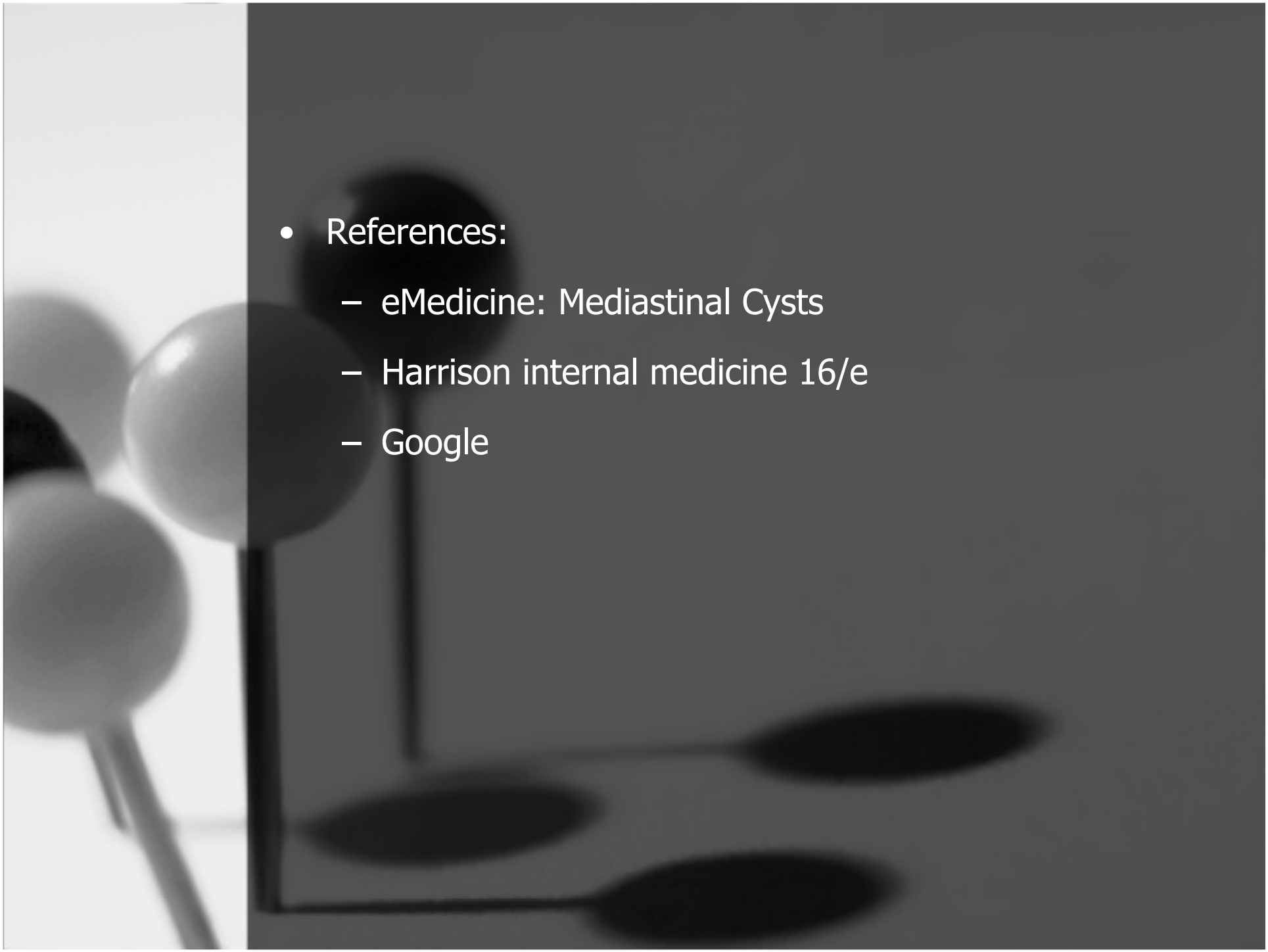
- Transthoracic needle biopsy
- Cervical mediastinoscopy
- Anterior mediastinotomy
- Posterior mediastinotomy
- Video-assisted thoracoscopy (VATS)
- Sternotomy and thoracotomy

Treatment

- **Surgical therapy:** the treatment of choice for most cysts that occur in the mediastinum.
- All large and symptomatic cysts are included. Some do not recommend resection of small asymptomatic cysts, while others advise aspiration of such cysts and resection only for those with symptoms or recurrence. Thymic cysts require excision or enucleation.
- If complete removal is not possible, the mucosal lining should be removed from the portion of cyst wall left within the mediastinum.

Prognosis of Mediastinal Cyst

- After resection：prognosis varies widely depending on the type of lesion resected.
- A benign tumors, prognosis is generally excellent.



- References:
  - eMedicine: Mediastinal Cysts
  - Harrison internal medicine 16/e
  - Google