

Congenital, Benign and Inflammatory Lung diseases

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- Congenital vascular lesions of the lung
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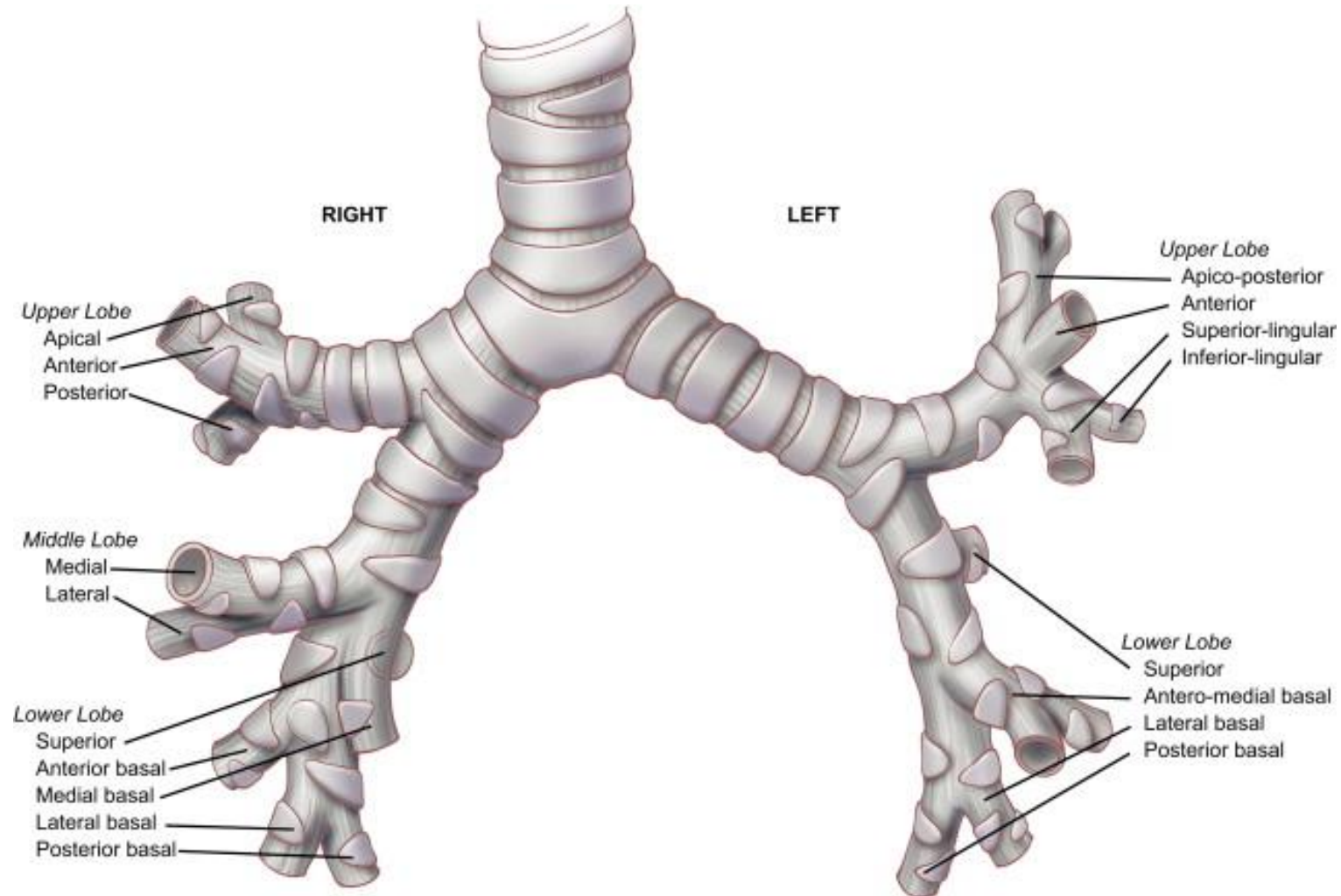
Congenital Lesions of the Lung

- Tracheal agenesis and atresia
- Bronchial anomalies
 - Tracheal diverticulum
 - Tracheal bronchus
 - Bronchial atresia
- Congenital lobar emphysema
- Pulmonary dysplasia
- Sequestration
- Bronchogenic cyst
- Congenital cystic adenomatoid malformation

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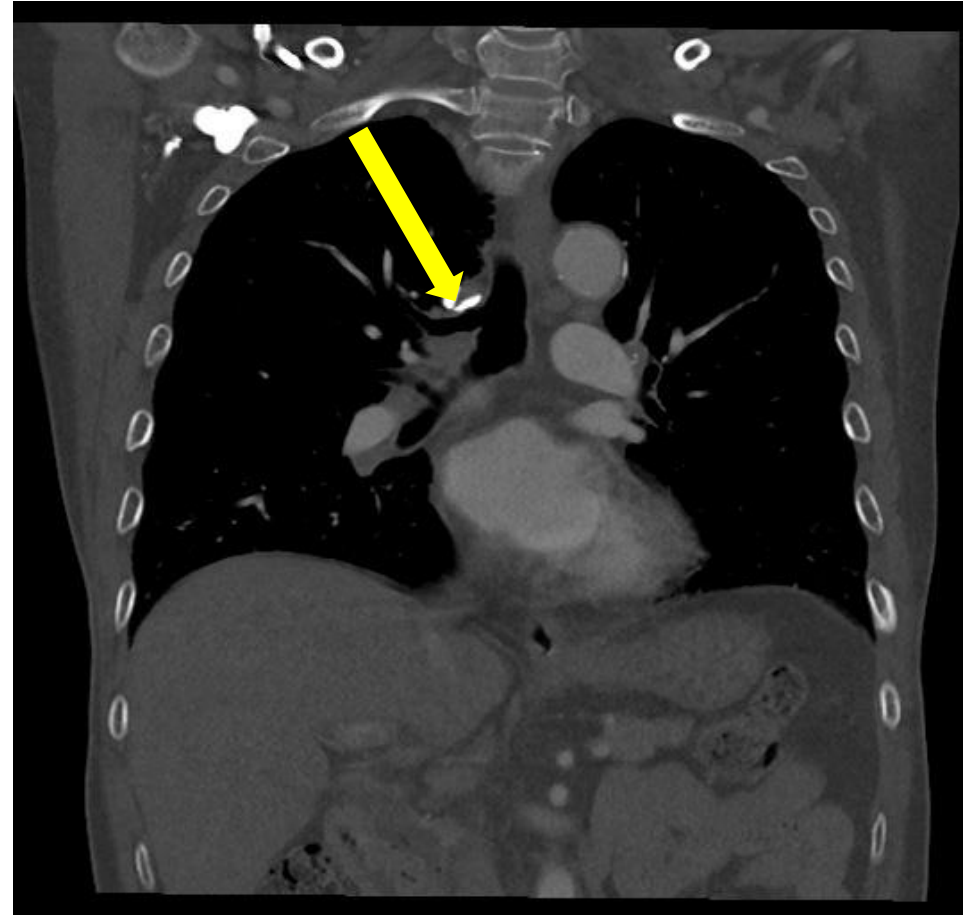
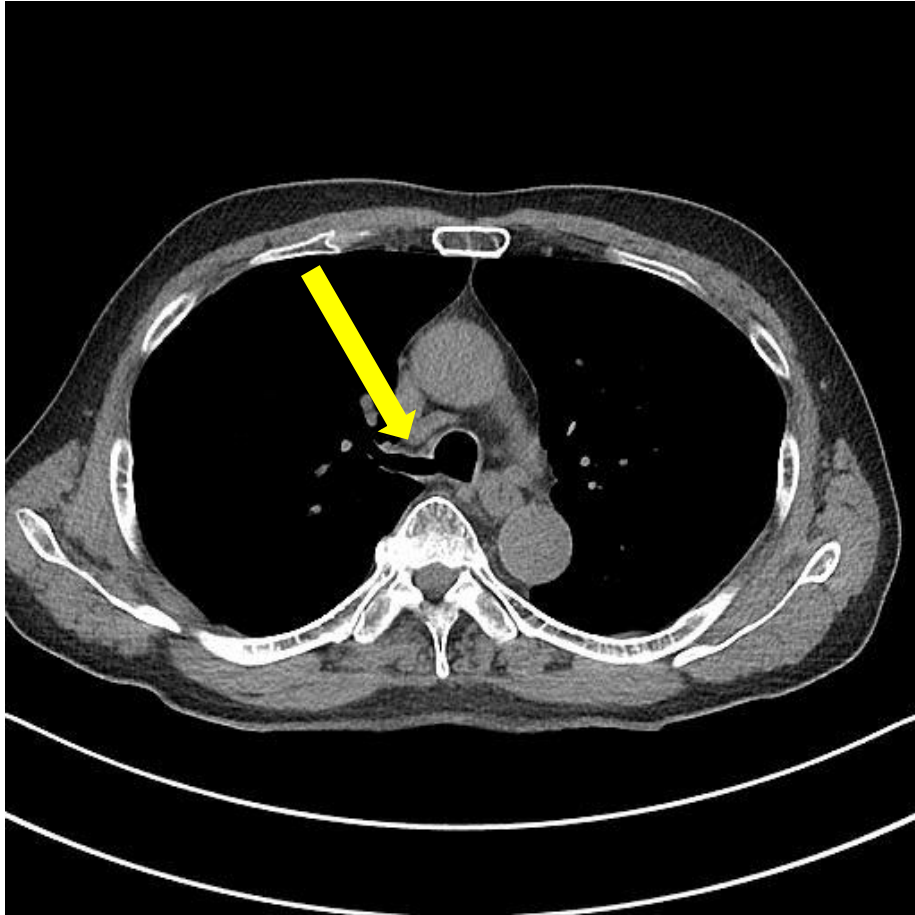
Tracheal bronchus



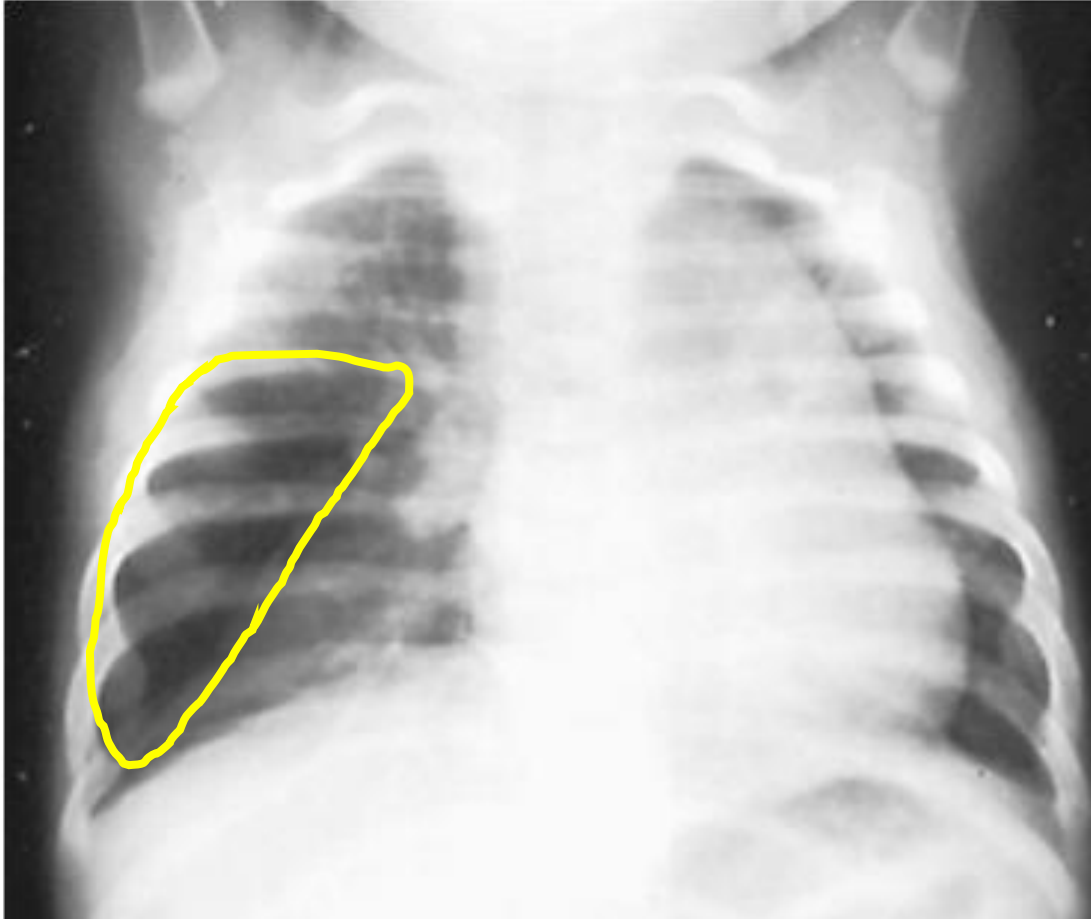
Tracheal bronchus



Tracheal bronchus

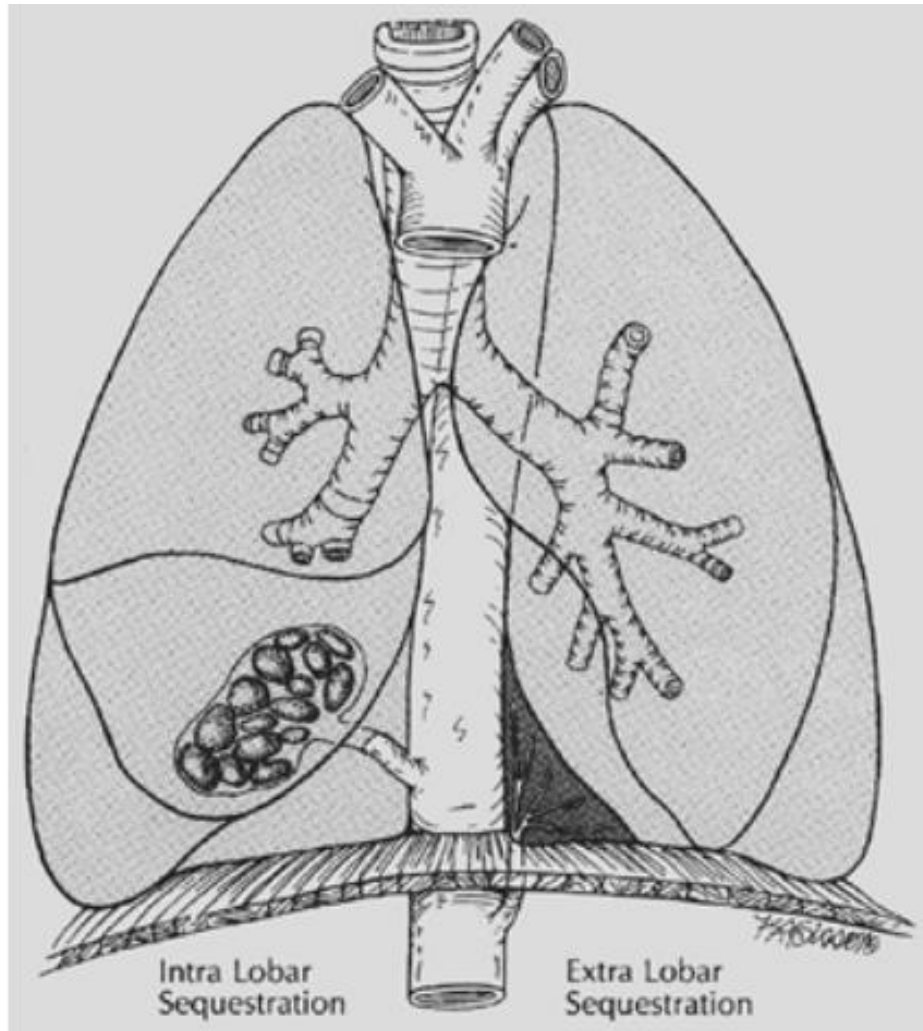


Congenital lobar emphysema



- Isolated hyperinflation of a lobe without extrinsic bronchial obstruction
- Frequent lobe: LUL, RML
- Severe pulmonary distress since infant
- Treatment: resection

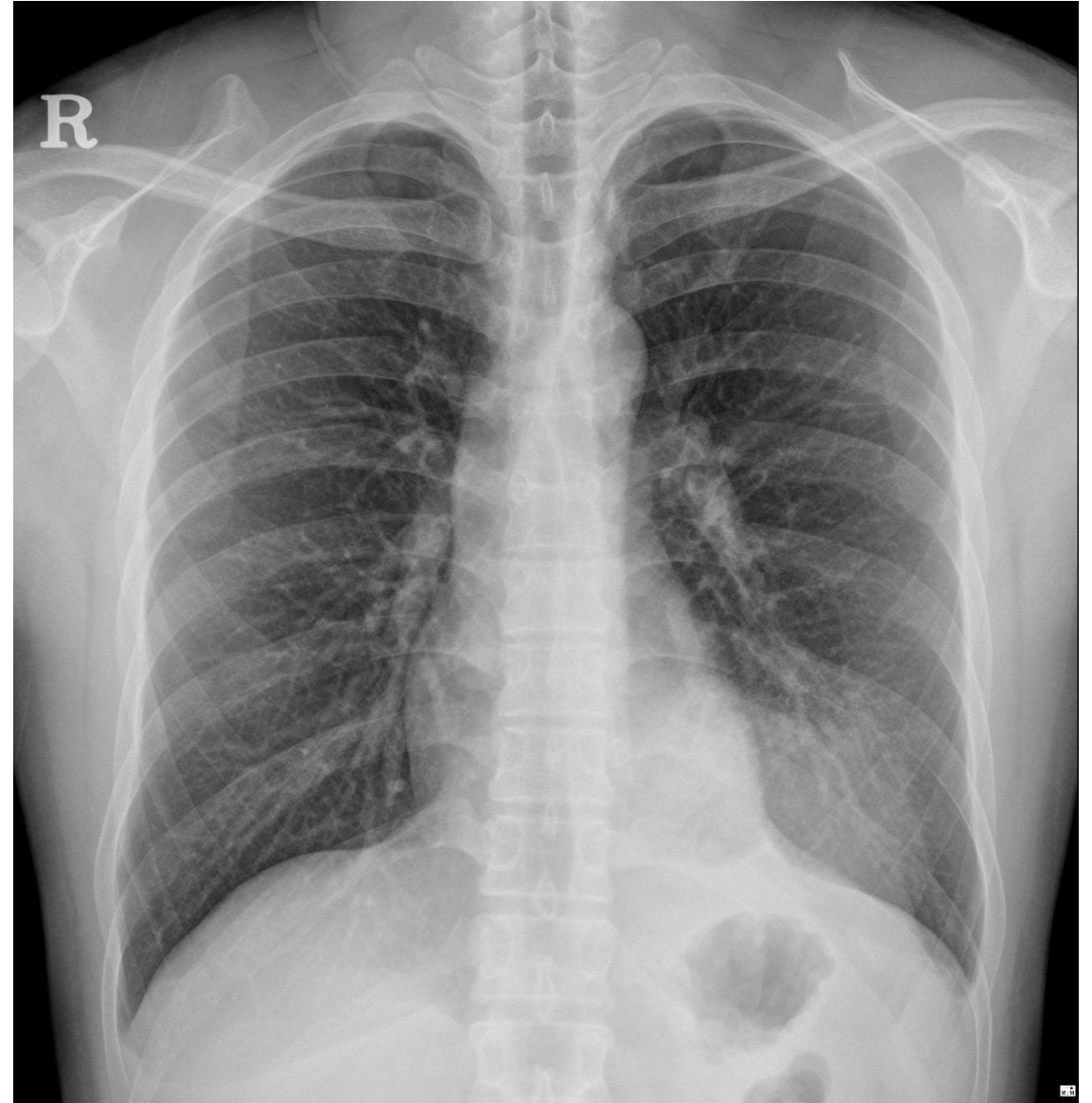
Sequestration



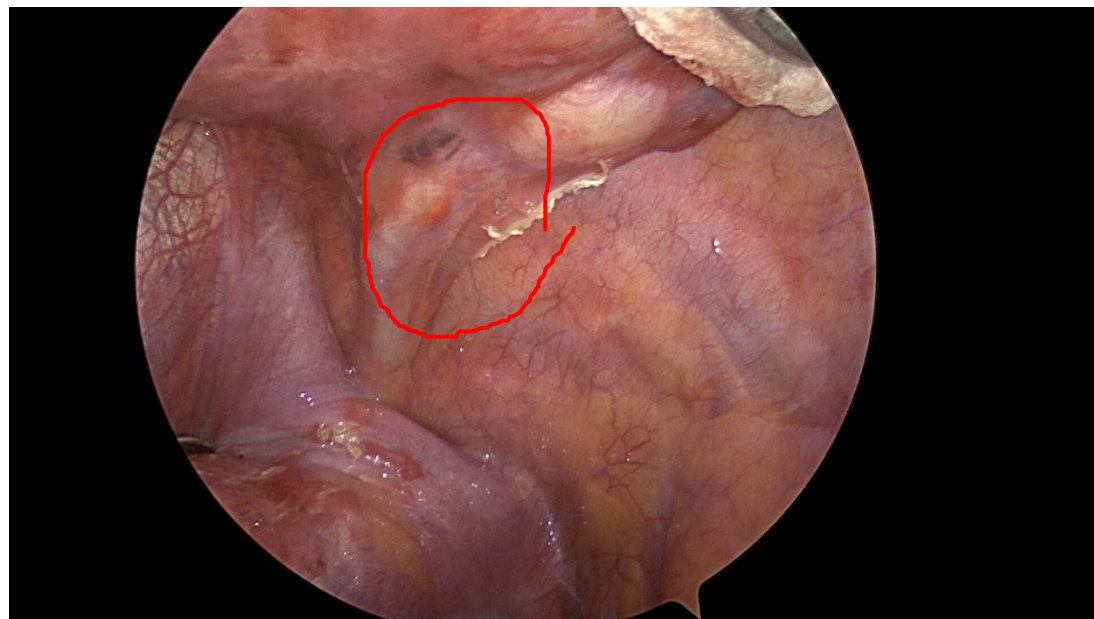
- Definition
 - A segment or lobe of lung tissue that has no bronchial communication with the normal tracheobronchial tree
 - Arterial supply: systemic vessel
 - Venous drainage: pulmonary vein > systemic vein
- Extralobar sequestration
 - Separated from normal lung by own visceral pleura
 - 25% of sequestration
 - Left (90%), posterior CPA angle (frequent), diaphragmatic hernia(30%)
- Intralobar sequestration
 - Within the normal lung parenchyme
 - Communication through the pores of Kohn may lead to chronic infection
 - Left > Right
 - Children and young adults: recurrent pneumonia in LLL

Sequestration

- 26 year-old male
- Recurrent pneumonia in LLL





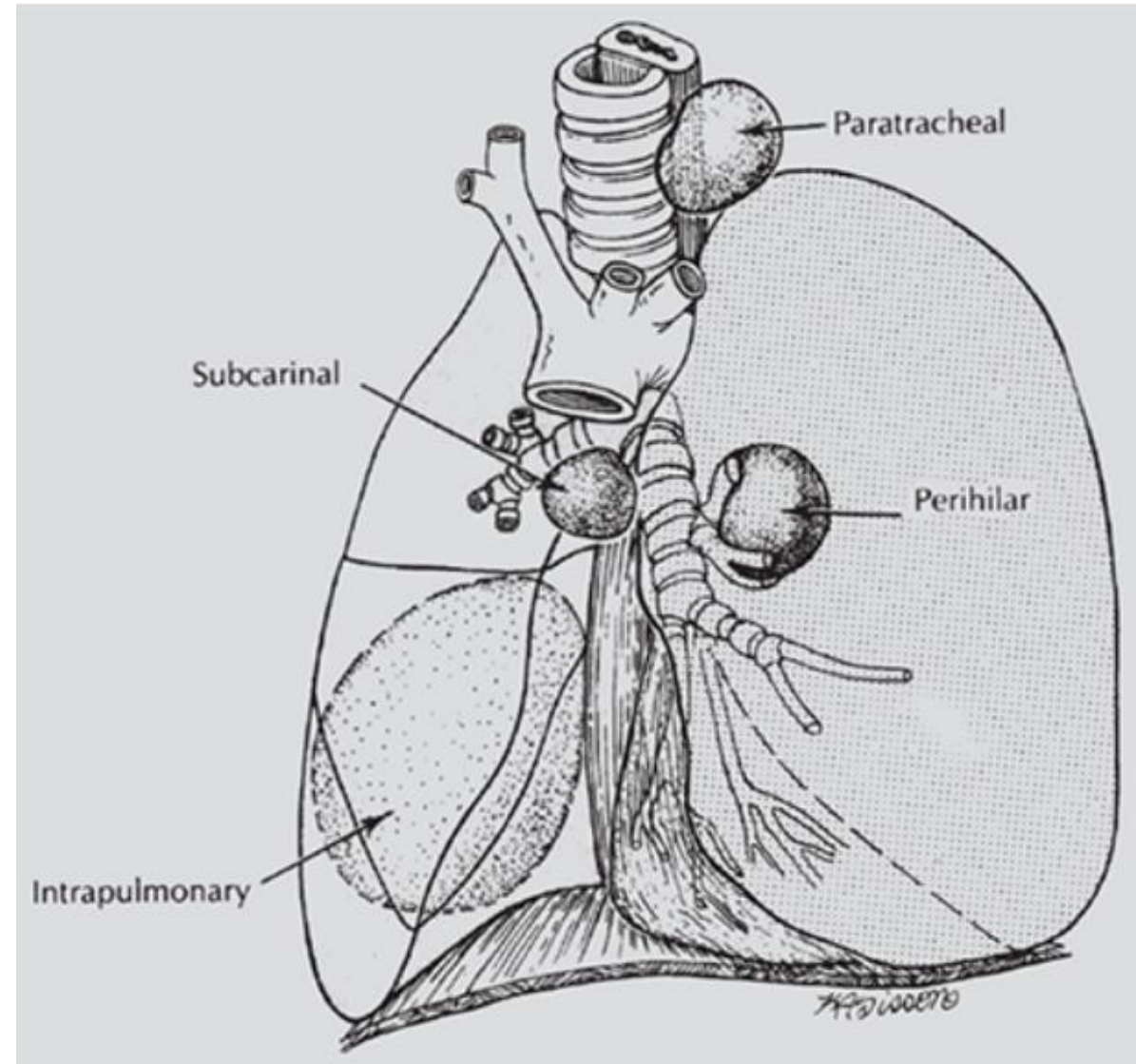




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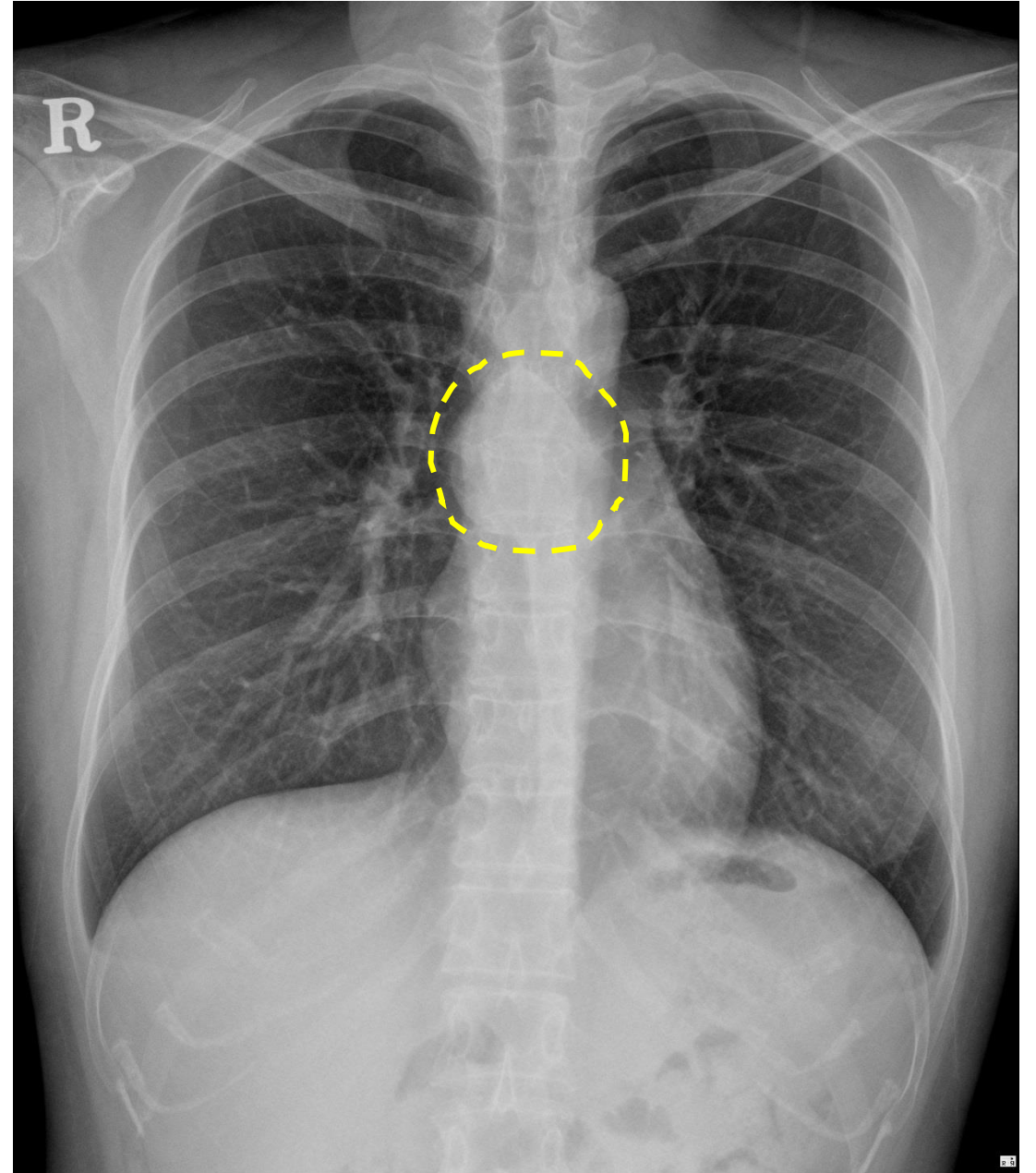
Bronchogenic cyst

- Bronchogenic cyst
 - Uncommon in extrathoracic locations
 - Lined with ciliated columnar or cuboidal epithelium
 - Thin wall, may contain cartilage and bronchial glands
 - Treatment: surgical resection
 - Minimally invasive technique
 - Parenchymal cyst: lung resection
 - Morbidity and mortality: zero

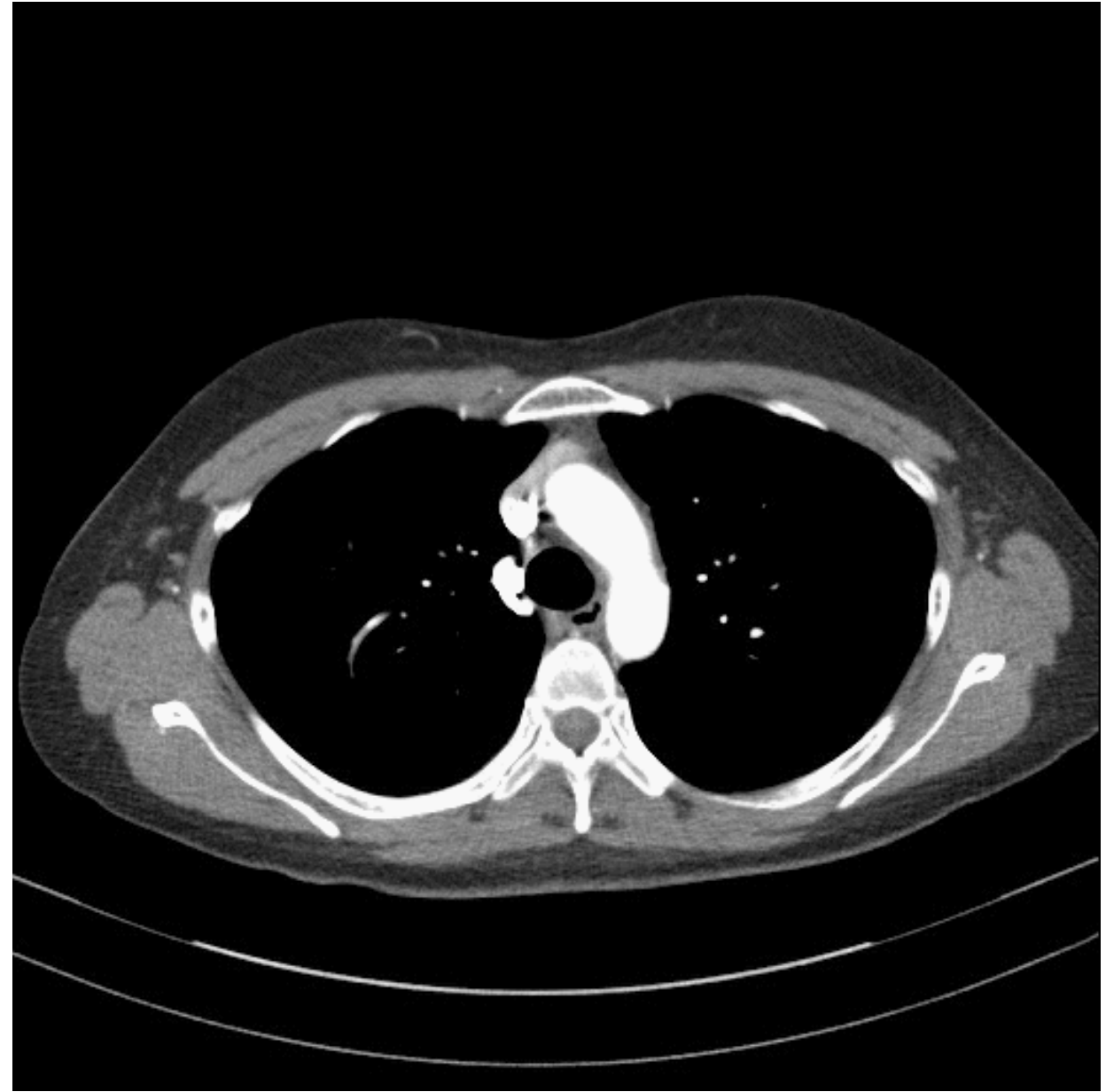
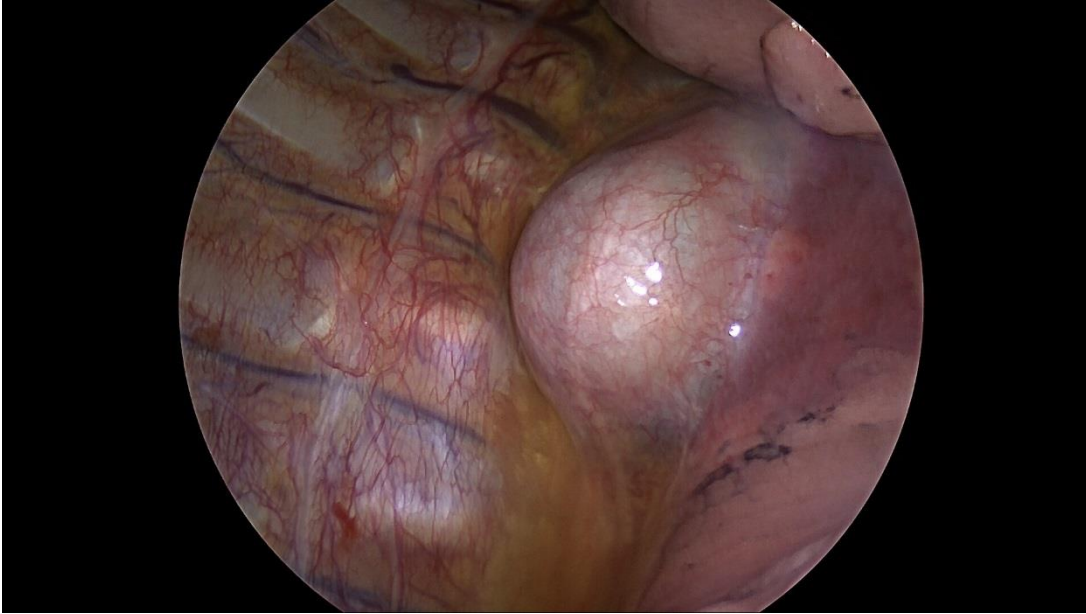


Bronchogenic cyst

- 31 year-old female
- No symptom
- Incidental finding in medical check-up



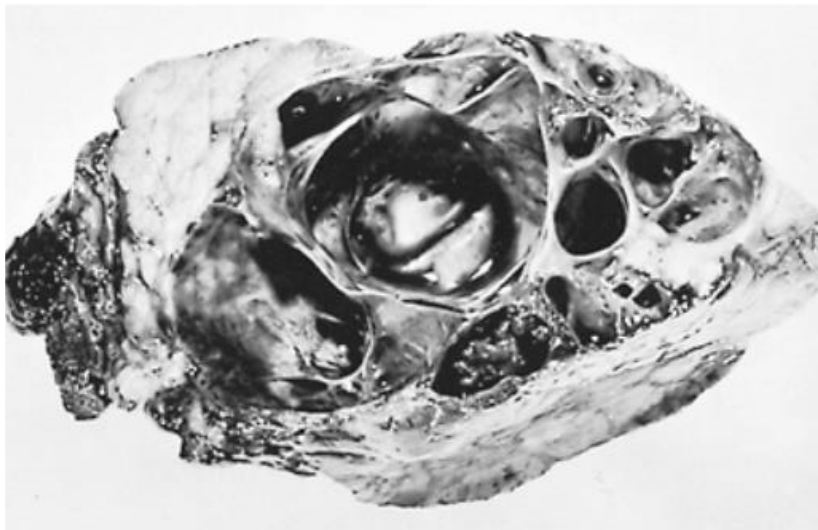
Bronchogenic cyst



Congenital cystic adenomatoid malformation

- Definition

- A spectrum of cystic and solid lesions of the lung can be identified histologically as CCAMs.
- An overgrowth of terminal bronchiolar-type tubular structures and a lack of mature alveoli.



- Histology

- An adenomatoid increase of terminal respiratory bronchiole-like structures
 - Lined by ciliated columnar epithelium occurs.
 - Interspersed cysts → immature alveoli
 - Connective stroma → disorganized elastic tissue and smooth muscle
- Mucosa cyst: lined with bronchial-type epithelium, polypoid overgrowth
- Bronchial mucoserous glands and cartilaginous plates: absent

Classification of CCAM

by Stocker et al. 1977

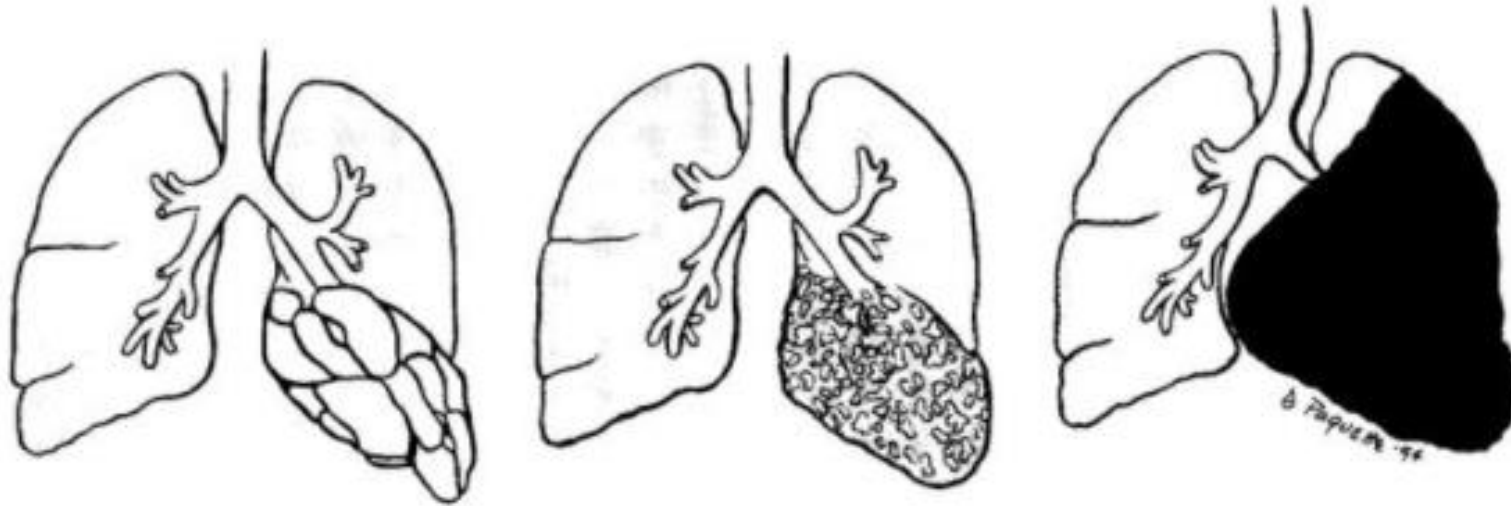


Figure 37-1. Depiction of Stocker's classification of type I, II, and III CCAM.

Type I: 50% of postnatal cases, favorite outcome

Type II: 40% of postnatal cases, high frequency of associated congenital anomalies

Type III: 10 % of postnatal cases, large homogenous microcystic mass, mediastinal shift
poor prognosis → non-immune hydrops fetalis, cardiorespiratory compromise

CCAM

- Treatment
 - Newborn
 - With large CCAM
 - Respiratory distress
 - Space occupying mass
 - Compression of contralateral lung
 - Surgical resection
 - Older child or adult
 - Surgical resection: source of recurrent pneumonia
- Timing of surgery
- Malignancy potential: some reports



Congenital Vascular Lesions of the Lungs

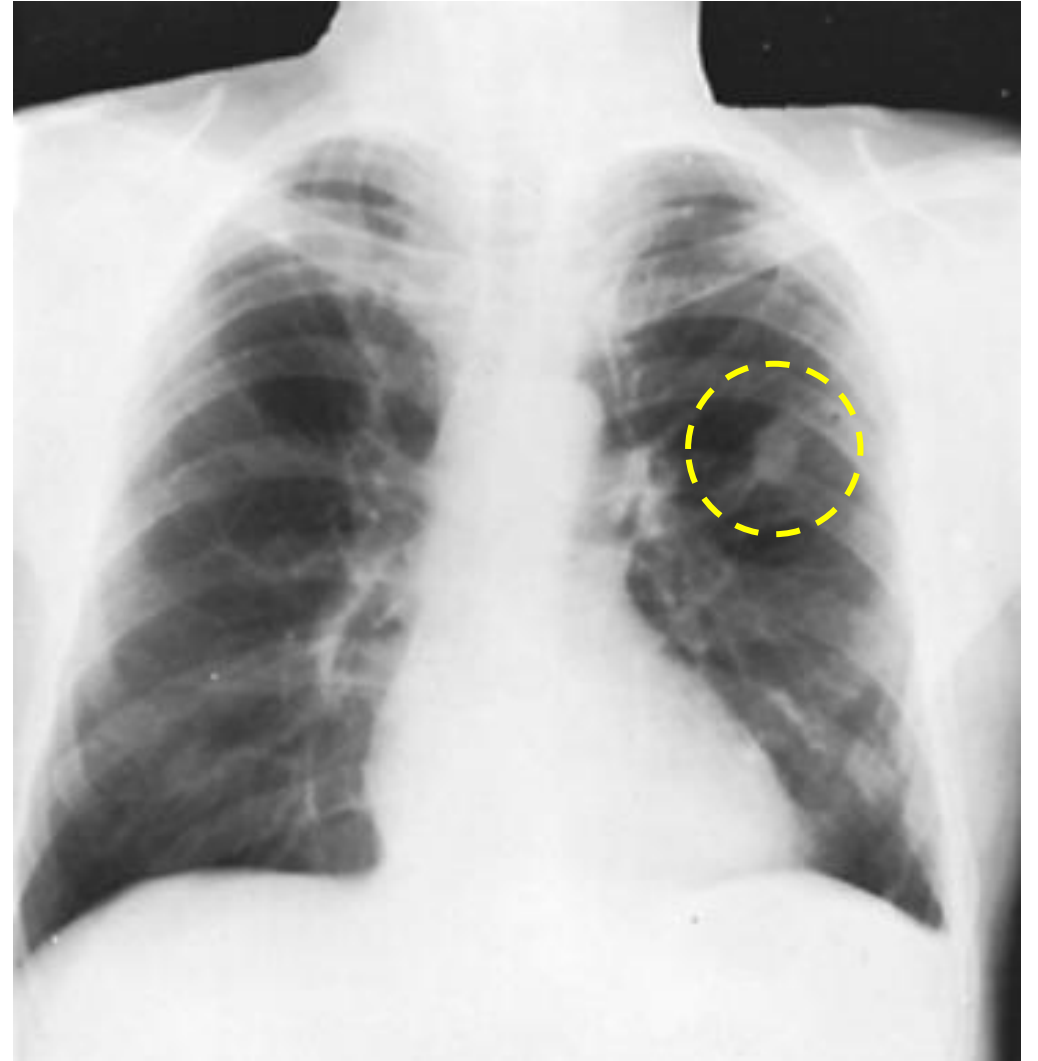
- Agenesis of a pulmonary artery
- Stenosis of a branch or branches of the pulmonary arteries
- Pulmonary arteriovenous fistula
- Abnormal pulmonary venous connection
- Varicosities of the pulmonary veins
- Lymphangiectasia

Congenital Vascular Lesions of the Lungs

- Agenesis of a pulmonary artery
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Pulmonary arteriovenous fistula

- Definition
 - Congenital malformations that result from errant capillary development
 - With incomplete formation or disintegration of vascular septa
- Incidence: 2-3 / 100,000
- Interrupt capillary filter of lung → embolism may occurs



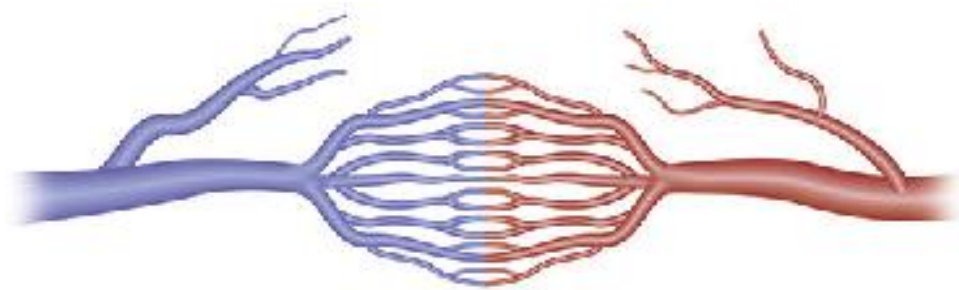
Pulmonary arteriovenous fistula

- Symptoms

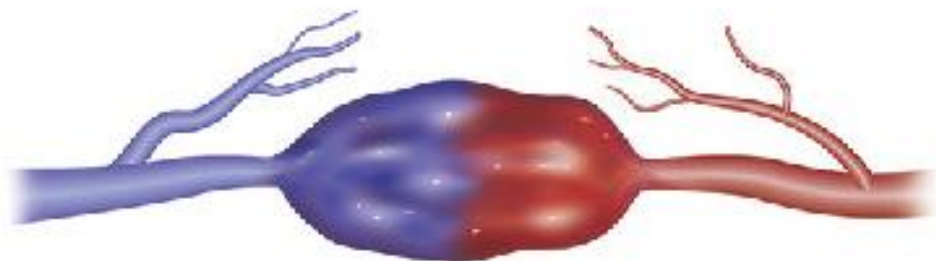
- Massive hemoptysis: uncommon
- Paradoxical embolization and stroke
 - Occurred in 10% of all untreated patients
- Brain abscess

- Treatment

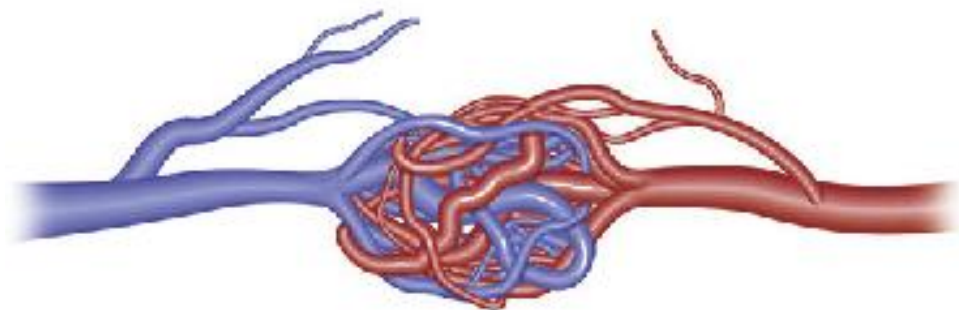
- Surgical resection
 - Best indicated in single lesion
 - Feeding artery > 3mm in diameter
 - High risk of paradoxical embolization and neurologic complications
- Embolic obliteration
 - Selective radiographically guided embolization
 - First line therapy
 - Unsuitable for surgery
 - Multiple PAVFs



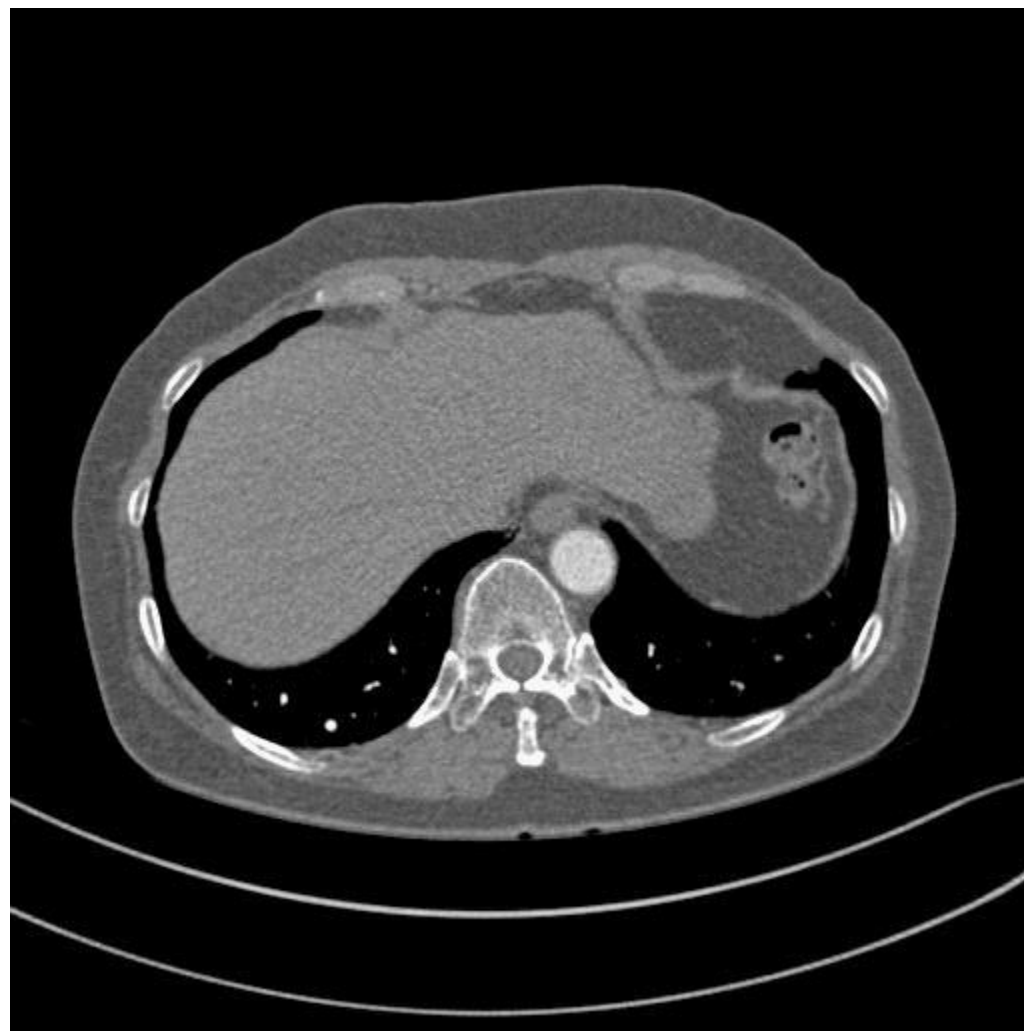
Normal



Simple AVM



Complex AVM



FD 37 cm



FD 42 cm



Bullous and Bleb Diseases of the Lungs

- Blebs
 - Well-circumscribed interpleural airspaces separated from underlying parenchyma by thin pleural covering.
 - Result of subpleural alveolar rupture
 - Outer wall: visceral pleura
 - Underlying lung: normal
 - Location: apex
- Bullae
 - Associated with any variety of emphysema
 - Wall: destroyed lung
 - Bronchial opening: usually located at the base of bullae

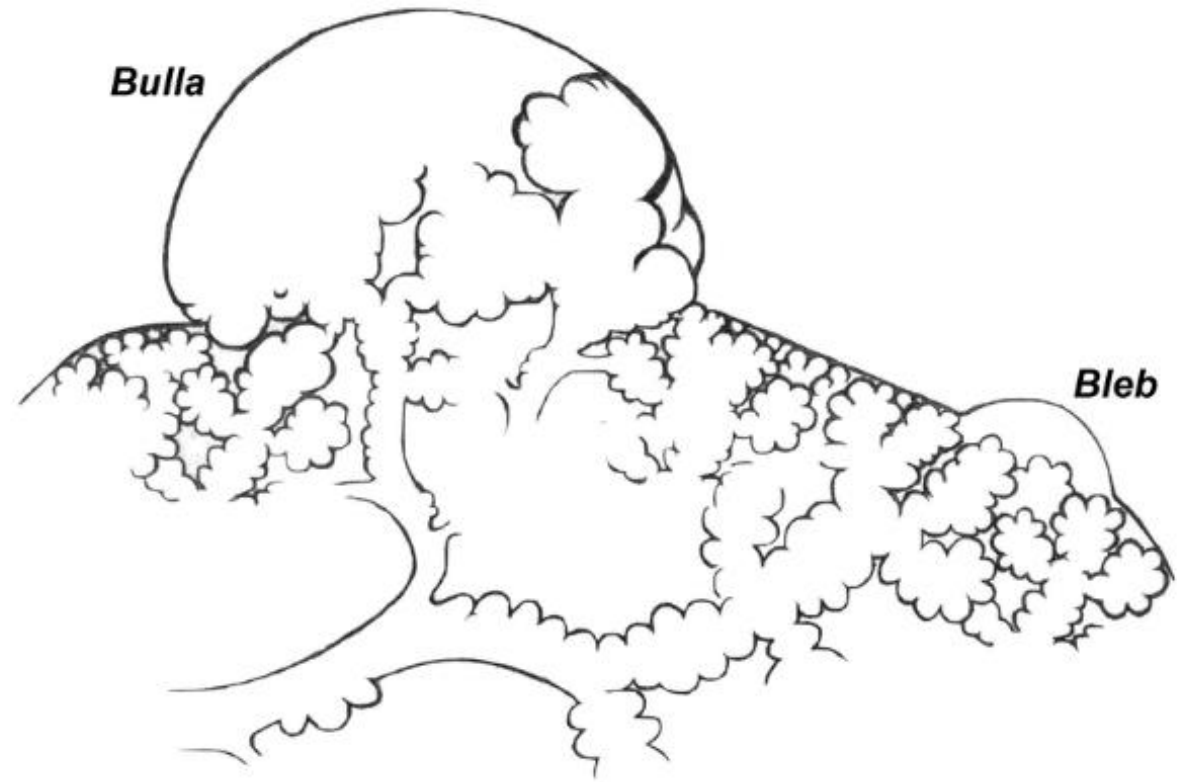


Table 87-2 Rationale and Indications for Surgery in Patients With Complications of Their Bullae

<i>Indication</i>	<i>Rationale for surgical approach</i>
Pneumothorax (first episode or recurrence)	Further reduction of function in patients already compromised Prolonged air leak High incidence of recurrences (>50%)
Infection of the bulla/empyema	Failure to respond to medical treatment
Hemoptysis	Management of significant hemoptysis
Chest pain	Pain clearly related to air trapping during hyperventilation
Treatment of lung cancer	Documented or highly cancer suspicious lesion

Bullous and Bleb Diseases of the Lungs

- 45 year-old male
- Smoker
- Chief complaint: progressive dyspnea
- Misinterpretation in ER
 - Pneumothorax
 - Chest tube insertion → BPF



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YoungTong-Ku Woncheon-Dong

Suwon-city, Kyungki-Do

Name: YU CHUL JAE	ID: 0532895	BSA: 1.72	Date: 2017-08-07
Tech: Cho In Ae	Height: 172.30	Age: 44	Room: 112W.34.06
Doctor:	Weight: 61.10	Sex: Male	Race: Asian

Diagnosis:

Dyspnea:

Tbco Prod:

Medications:

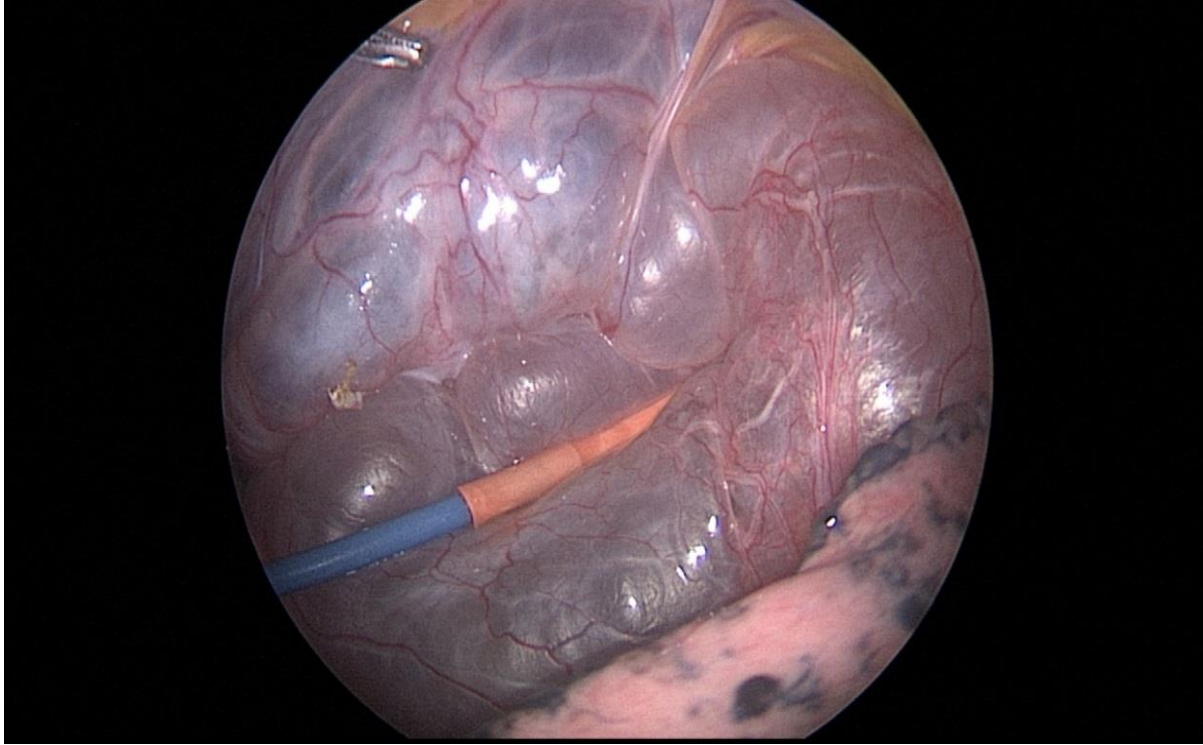
Pre Test Comments:

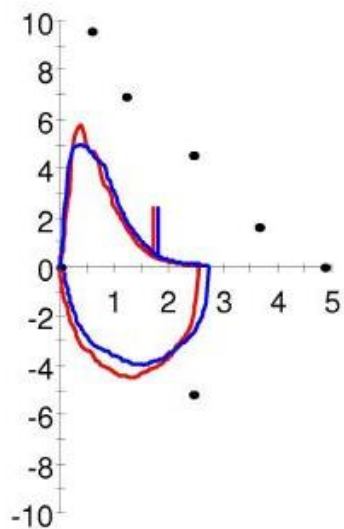
Post Test Comments:

Cough:	Wheeze:
Yrs Smk:	Pks/Day:
	Yrs Quit:

	Pre-Bronch			Post-Bronch		
	Actual	Pred	% Pred	Actual	% Pred	% Chng
--- SPIROMETRY ---						
FVC (L)	2.55	4.85	52	2.73	56	+6
FEV1 (L)	1.74	3.83	45	1.82	47	+4
FEV1/FVC (%)	68	79	86	67	84	-2
FEF 25% (L/sec)	4.65	6.97	66	4.52	64	-2
FEF 75% (L/sec)	0.26	1.61	16	0.34	21	+31
FEF 25-75% (L/sec)	0.88	3.57	24	1.13	31	+28
FEF Max (L/sec)	5.70	9.58	59	4.93	51	-13
FIVC (L)	2.55			2.66		+4
FIF Max (L/sec)	4.47			3.97		-11
--- LUNG VOLUMES ---						
SVC (L)	2.54	4.85	52			
IC (L)	1.66	3.27	50			
ERV (L)	0.88	1.58	55			
--- DIFFUSION ---						
DLCOunc (ml/min/mmHg)	17.73	29.42	60			
DLCOcor (ml/min/mmHg)	17.59	29.42	59			
DL/VA (ml/min/mmHg/L)	5.22	4.52	115			
VA (L)	3.37	6.51	51			
Hgb (gm/dL)	14.9	12-18				







• Pred — Pre — Post

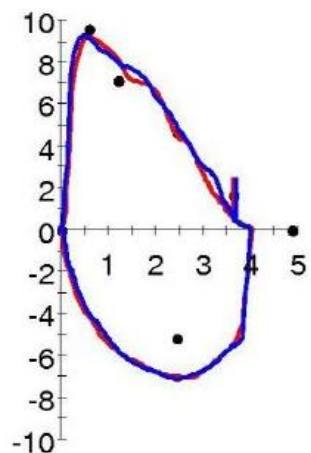
--- SPIROMETRY ---

FVC (L)	2.55
FEV1 (L)	1.74
FEV1/FVC (%)	68
FEF 25% (L/sec)	4.65
FEF 75% (L/sec)	0.26
FEF 25-75% (L/sec)	0.88
FEF Max (L/sec)	5.70
FIVC (L)	2.55
FIF Max (L/sec)	4.47

--- LUNG VOLUMES ---

SVC (L)	2.54
IC (L)	1.66
ERV (L)	0.88

Pre-Bronch			Post-Bronch		
Actual	Pred	% Pred	Actual	% Pred	% Chng
2.55	4.85	52	2.73	56	+6
1.74	3.83	45	1.82	47	+4
68	79	86	67	84	-2
4.65	6.97	66	4.52	64	-2
0.26	1.61	16	0.34	21	+31
0.88	3.57	24	1.13	31	+28
5.70	9.58	59	4.93	51	-13
2.55			2.66		+4
4.47			3.97		-11



• Pred — Pre — Post

--- SPIROMETRY ---

FVC (L)	4.04
FEV1 (L)	3.64
FEV1/FVC (%)	90
FEF 25% (L/sec)	8.59
FEF 75% (L/sec)	2.54
FEF 25-75% (L/sec)	5.30
FEF Max (L/sec)	9.11
FIVC (L)	4.01
FIF Max (L/sec)	7.05

--- LUNG VOLUMES ---

SVC (L)	3.95
IC (L)	2.46
ERV (L)	1.48

Pre-Bronch			Post-Bronch		
Actual	Pred	%Pred	Actual	%Pred	% Chng
4.04	4.85	83	4.02	82	+0
3.64	3.83	95	3.71	96	+1
90	79	114	92	116	+2
8.59	7.14	120	8.35	116	-2
2.54	1.65	153	2.99	181	+17
5.30	3.57	148	5.49	153	+3
9.11	9.58	95	9.15	95	+0
4.01			3.97		+0
7.05			7.11		+0

Bacterial Infections of the Lungs

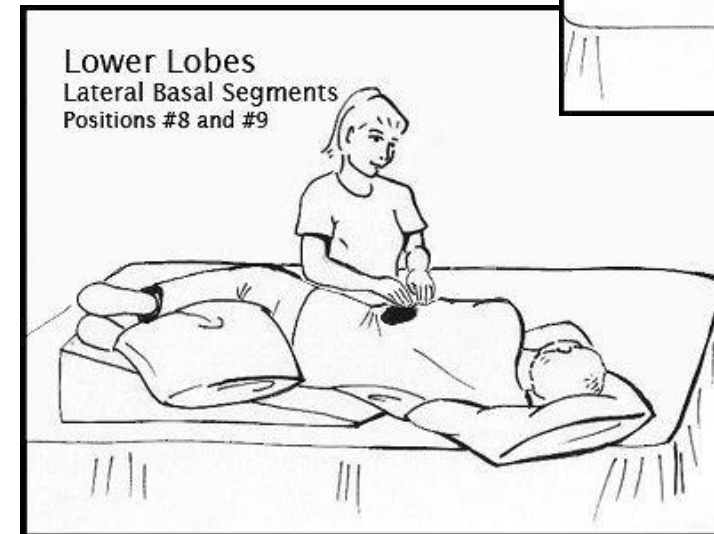
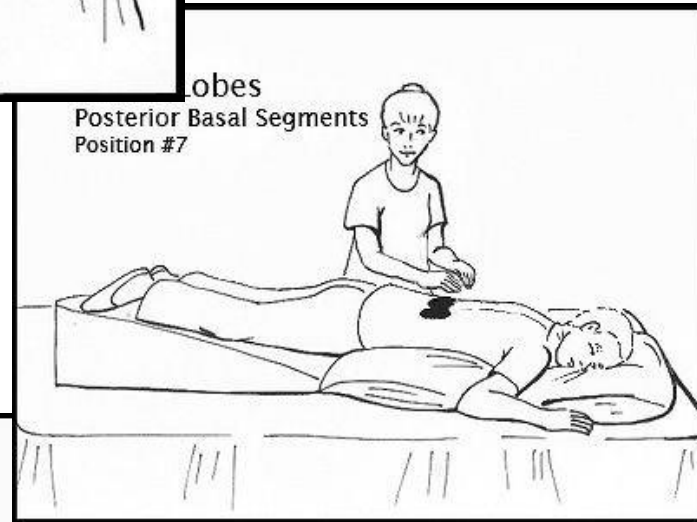
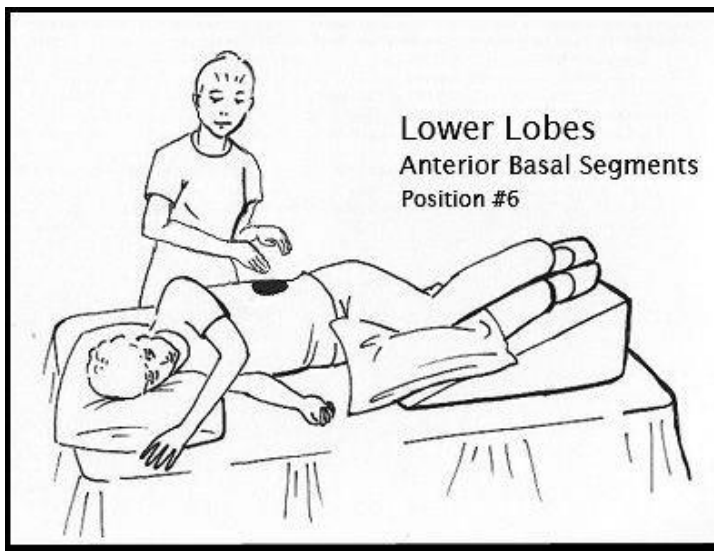
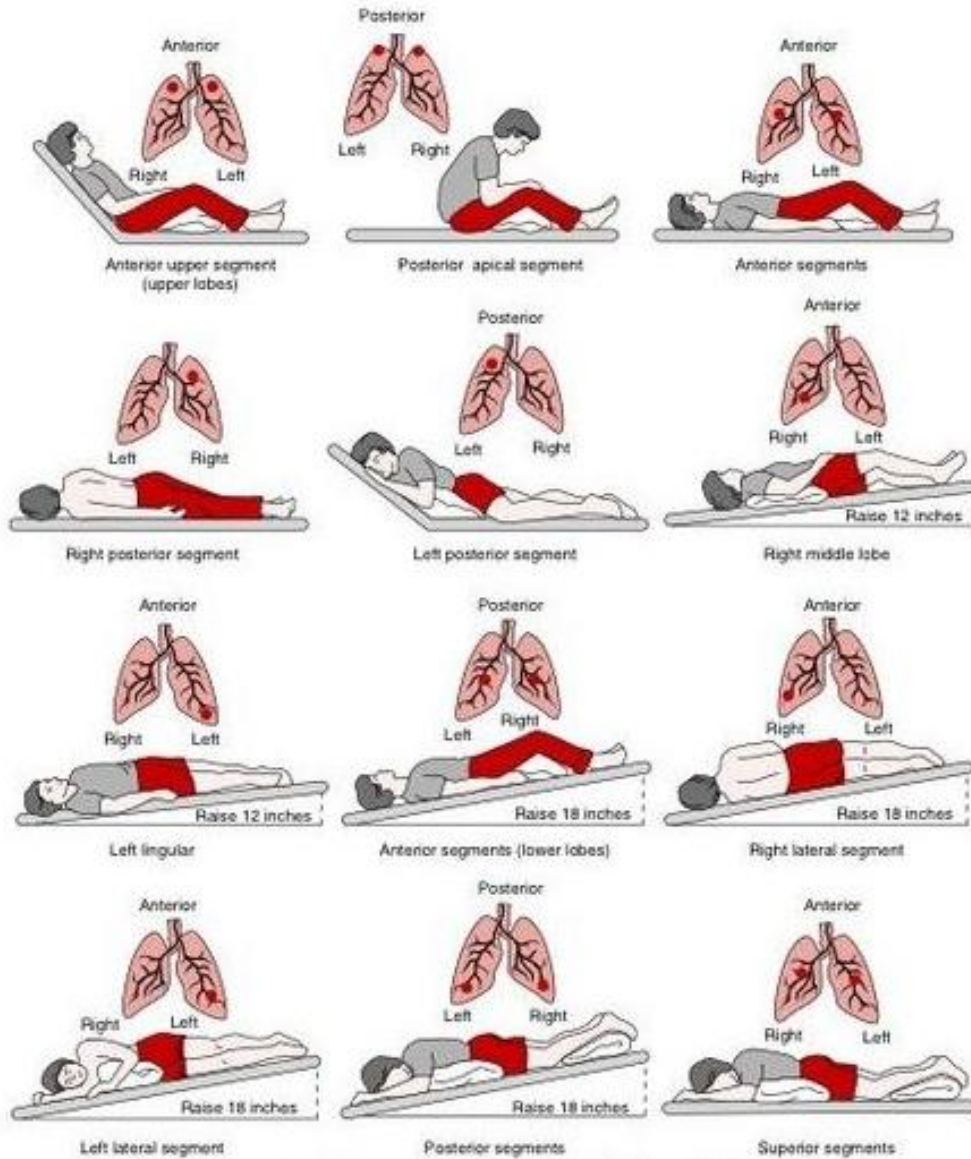
- Bronchiectasis
- Lung abscess

Bronchiectasis

- Definition
 - Bronchiectasis
 - In *Greek*
 - Bronchus + *Ektasis* (dilatation)
 - Abnormal permanent dilatation of subsegmental airways
- Frequency (in order)
 - Left lower lobe
 - Right middle lobe, left lingular
 - Total left lung
 - Total right lung
- Treatment of bronchiectasis
 - Medical
 - Prevention and Control
 - Antibiotics
 - Postural drainage
 - Surgical
 - Unilateral, segmental, or lobar distribution
 - Persistent, recurrent symptoms when medication is discontinued
 - Recurrent infection and hemoptysis
 - Transplantation

Patient Positions for Postural Drainage

Cardiopulmonary Assessment and Intervention





Lung abscess

- Definition
 - Necrosis of the pulmonary tissue and formation of cavities containing necrotic debris or fluid caused by microbial infection
- DDx: Empyema
 - Collection of pus in pleural space

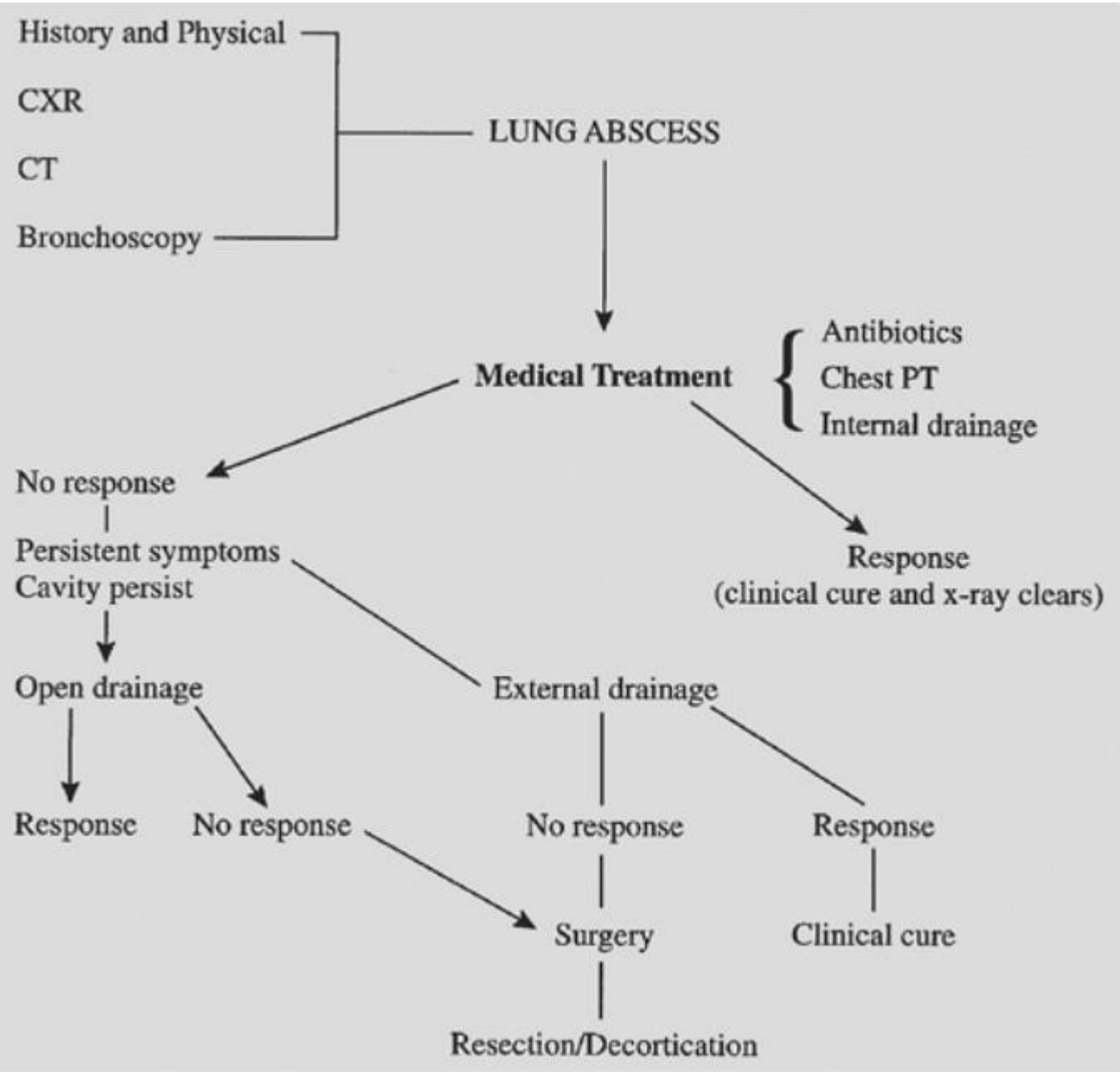
Abscess	Empyema
Intermediately thickened (4–15 mm) walls	Thin walls
Spherical	Lenticular
<u>Surrounded by consolidation</u>	“Split pleura” sign (CT)
Equal-length air-fluid levels on frontal and lateral radiographs	Different-length air fluid levels on frontal and lateral radiographs
Narrow interface with chest wall (CT)	Broad contact with chest wall
Bronchovascular markings extend to abscess	Adjacent compressed lung

Table 89-9 Contributing Factors to Lung Abscess

- Dental and periodontal disease
- Anesthesia
- Alcohol abuse
- Seizure disorders
- Immunosuppression
- Neuromuscular disorders with bulbar dysfunction
- Esophageal motor disorders
- Bronchial obstruction

Table 89-10 Bacteriology of Lung Abscess

- Anaerobic
- Bacteroides fragilis*
 - Fusobacterium bacilli*
 - Streptococcus*, β -hemolytic streptococcus
- Aerobic
- Klebsiella pneumoniae*
 - Pseudomonas aeruginosa*
 - Staphylococcus aureus*
 - Streptococcus pneumoniae*
 - Haemophilus influenzae*



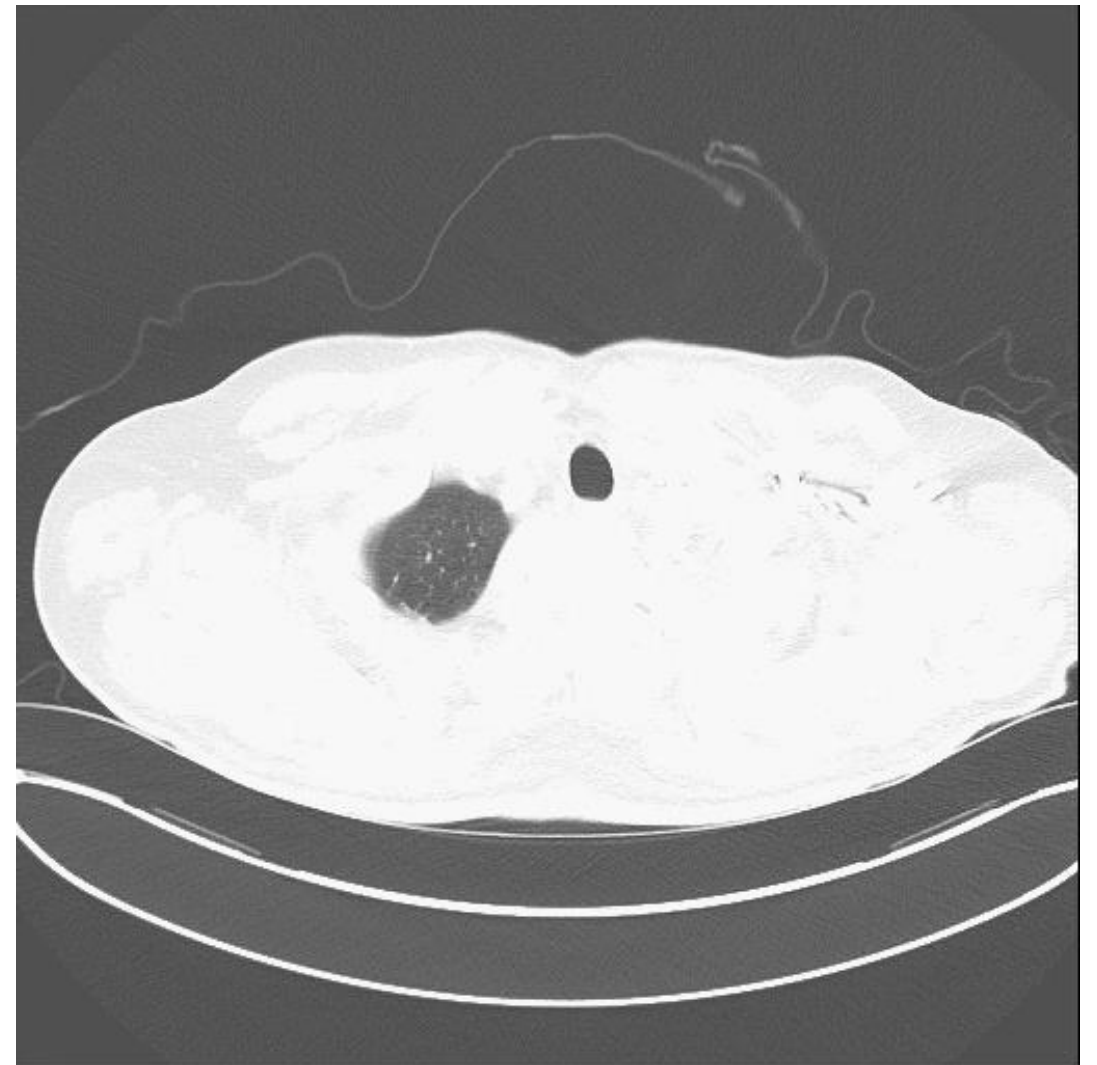
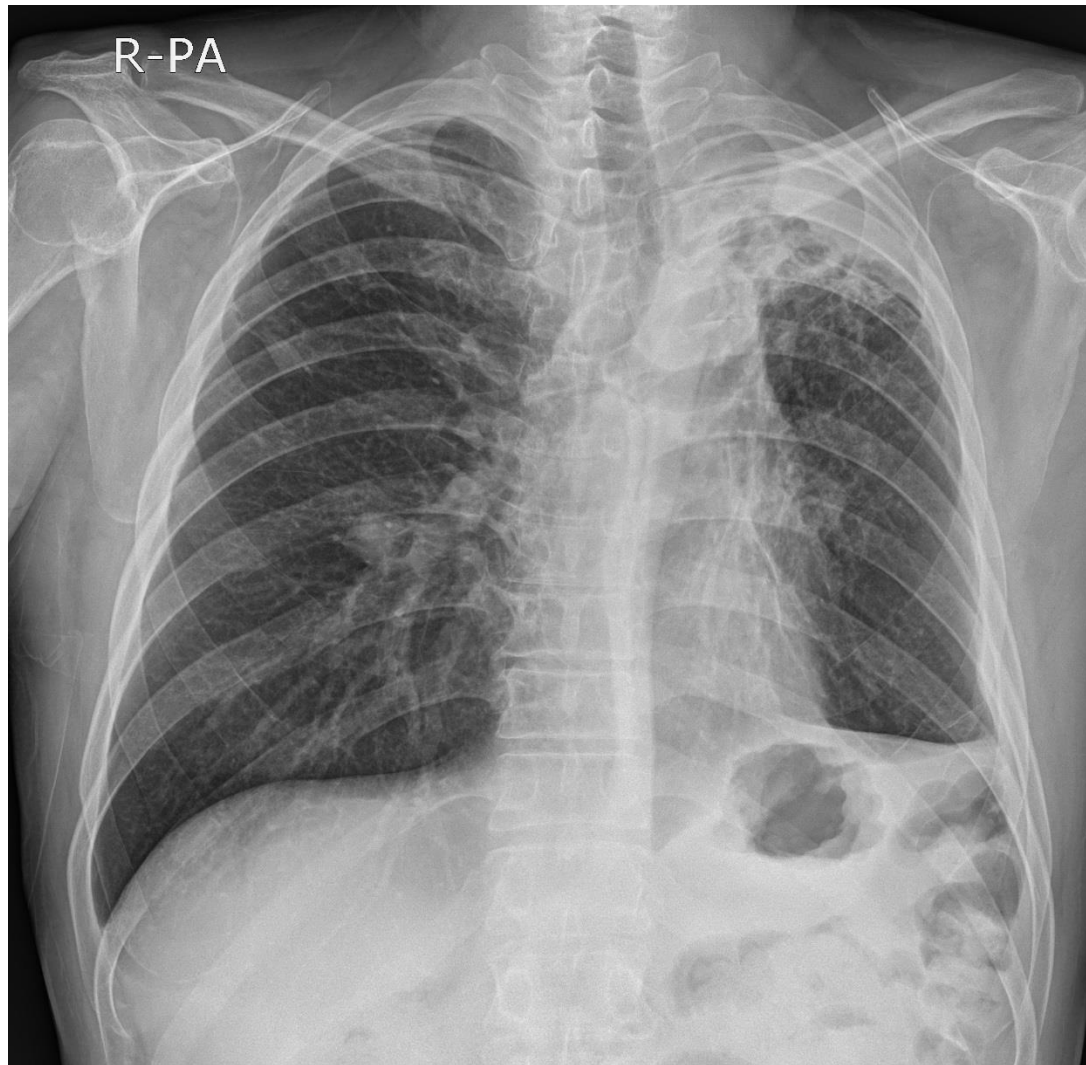
Pulmonary Tuberculosis

- Classical treatment
 - Collapse therapy (by collapsing cavitory disease, the organisms would be deprived of oxygen and thus die)
- Surgical indications
 - Destroyed lung
 - Cavitory disease, no response in medical therapy
 - Life threatening hemoptysis
 - Bronchial stricture
 - Suspected malignancies
- Frequent complication after operation
 - Empyema
 - Broncho-pleural fistula

Other Infected Lung Diseases

- Aspergillosis
- Actinomycosis
- Amebiasis
- Candidiasis
- Cryptococcosis
- Paragonimiasis
- Etc.

Pulmonary tuberculosis



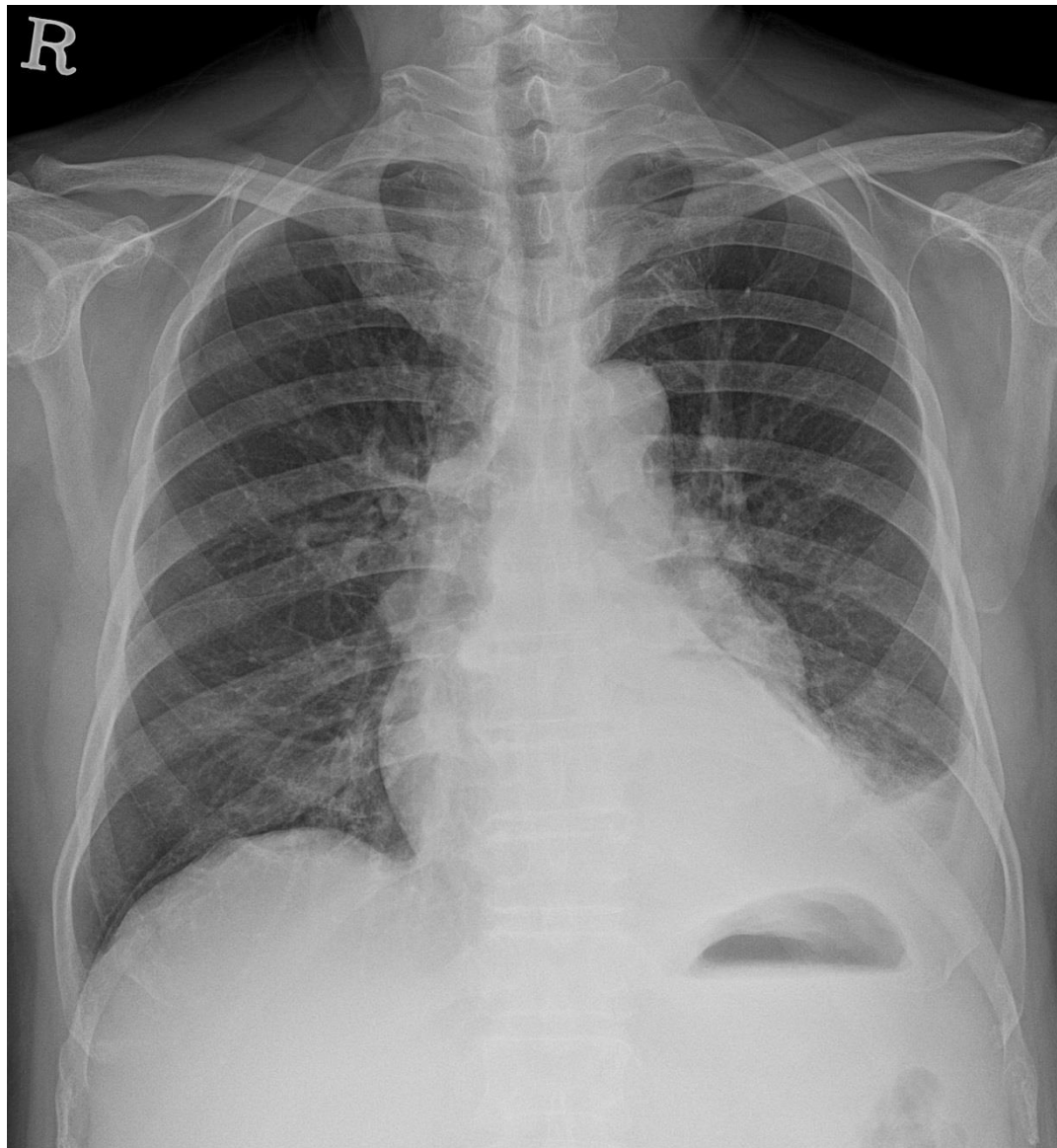
Rot +8°
Ang +1°
FD 48 cm

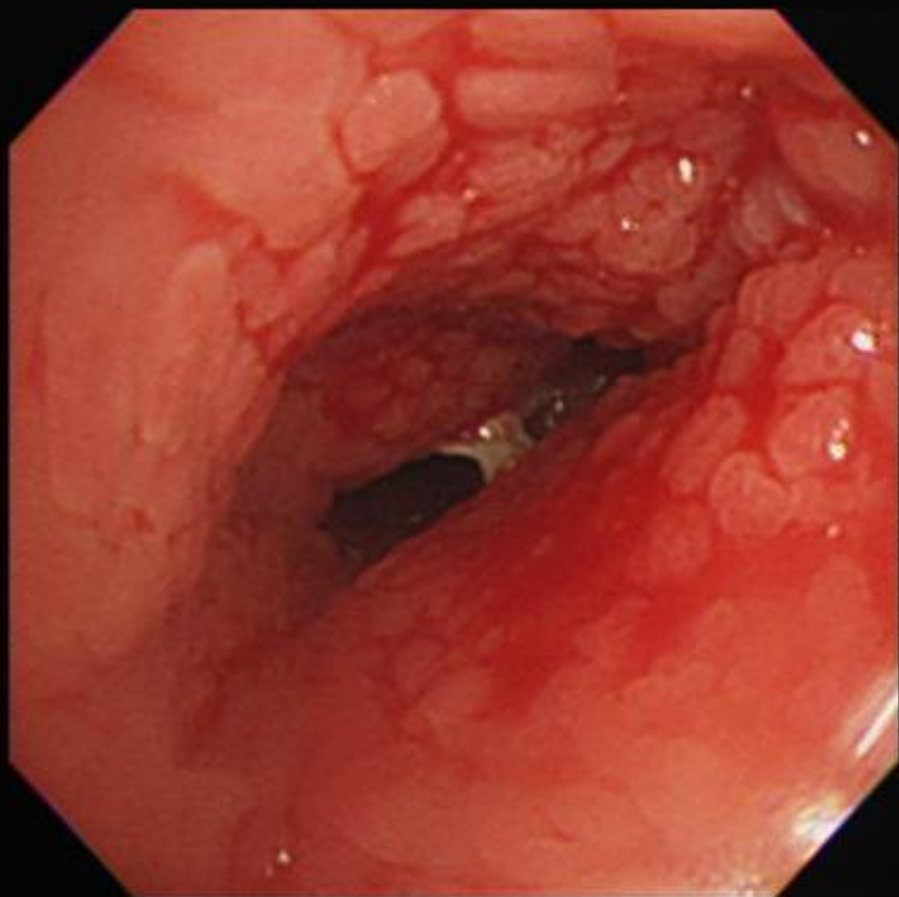


0:00
3:67
11:12:58



Pulmonary actinomycosis





Pulmonary aspergillosis





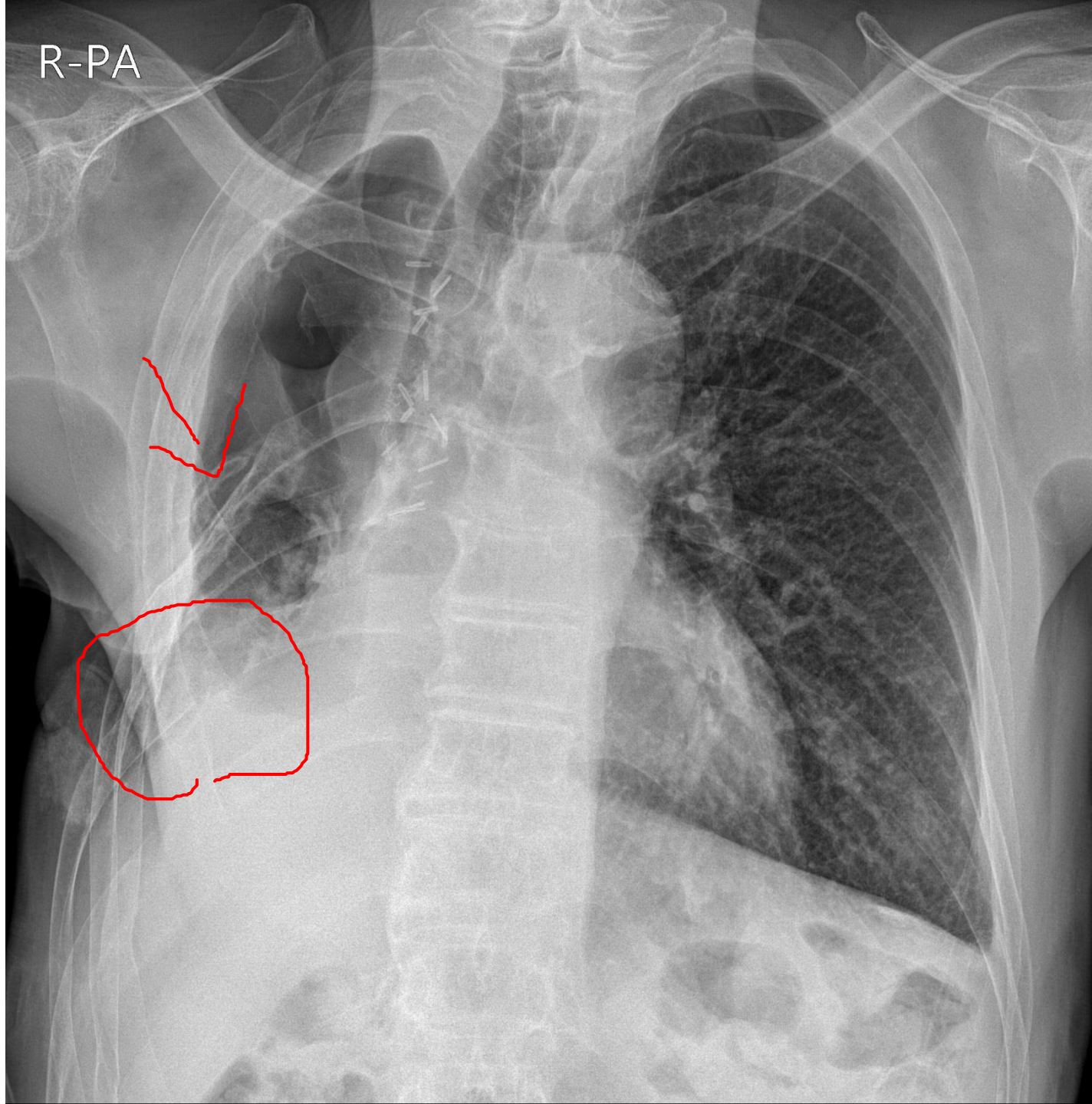
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cm

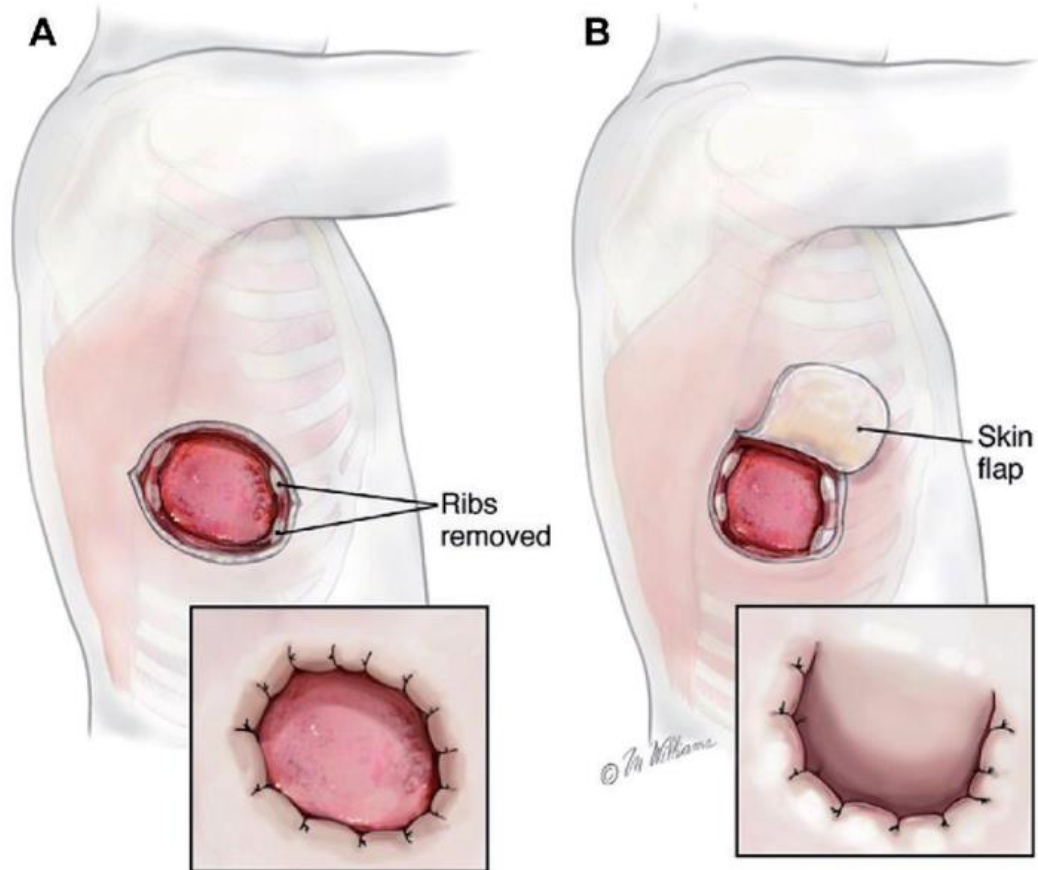
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R-PA



Open window formation



- Clagett window
- Eloesser flap

Solitary Pulmonary Nodule

- Definition
 - Single, spherical, well-circumscribed, radiographic opacity
 - $\leq 3\text{cm}$
 - Surrounded completely by aerated lung
 - Not associated atelectasis, hilar enlargement or pleural effusion

Solitary Pulmonary Nodule

Neoplasms

Malignant

Lung cancer

Carcinoid tumor

Metastasis—carcinoma, sarcoma, melanoma, germ cell

Uncommon malignant primary lung tumors—blastoma, carcinosarcoma, lymphoma, melanoma, plasmacytoma, salivary gland—type tumors (adenoid cystic, mucoepidermoid, acinic cell, mixed, oncocyoma), sarcoma, teratoma, thymoma

Benign

Hamartoma

Uncommon benign primary lung tumors—alveolar adenoma, clear cell tumor (sugar tumor), chondroma, Clara cell adenoma, fibroma, fibromyxoma, glomus tumor, granular cell myoblastoma, hibernoma, leiomyoma, lipoma, mucous gland adenoma, neurogenic tumor, sclerosing hemangioma, squamous papilloma, teratoma, thymoma, xanthoma

Nonneoplastic lesions

Infectious granulomas—histoplasmosis, tuberculosis, coccidioidomycosis, cryptococcosis, blastomycosis, aspergillosis, nocardiosis

Other—abscess, arteriovenous malformation, bronchogenic cyst, pulmonary infarction, intrapulmonary lymph node, organizing pneumonia, parasitic lesions (echinococcus, ascaris, dirofilaria), plasma cell granuloma (inflammatory pseudotumor), postinflammatory fibrosis, rounded atelectasis, sequestration, venous varix

Lesions that are usually multiple but may be solitary

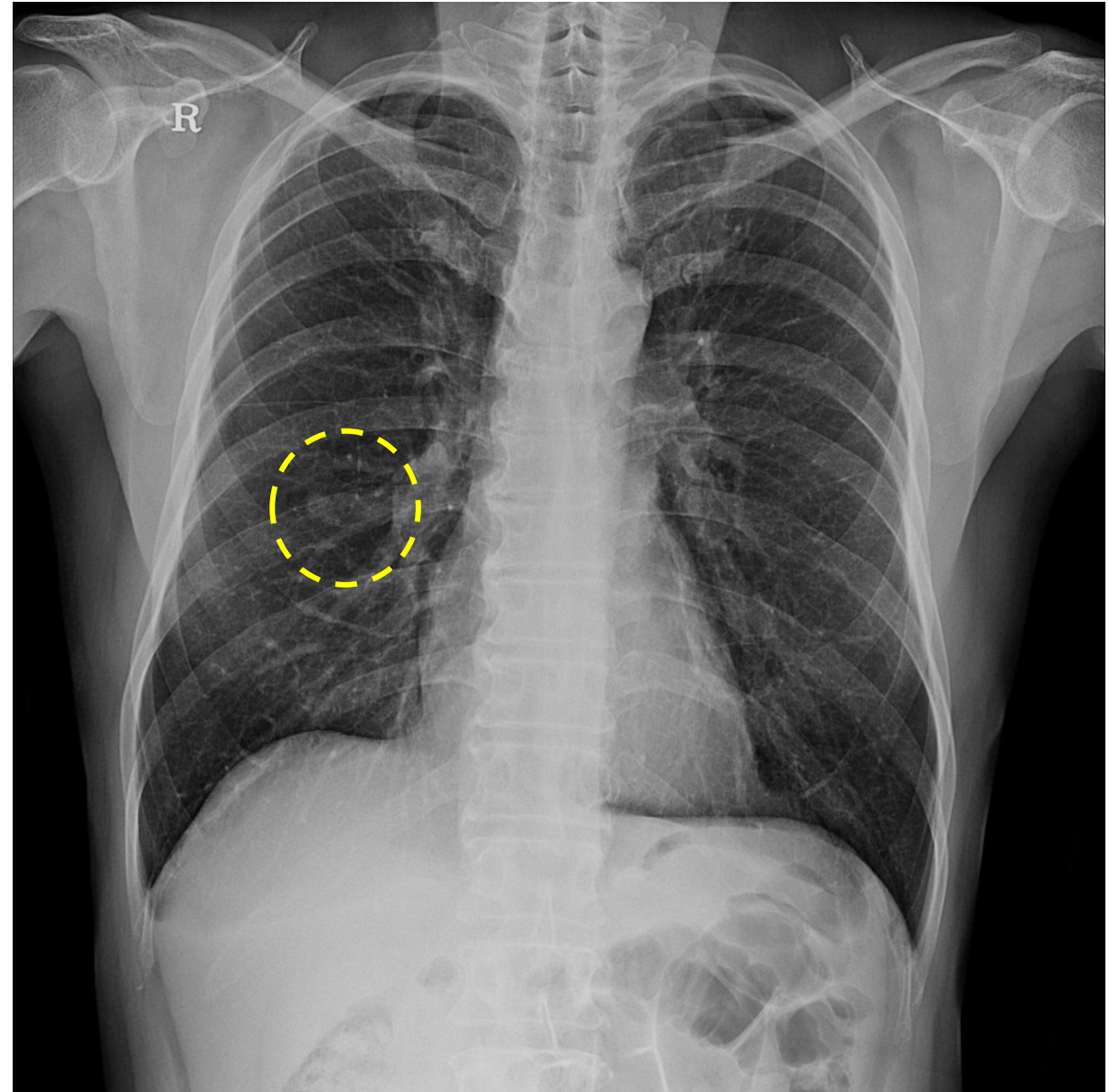
Amyloid nodule, bronchiolitis obliterans—organizing pneumonia (BOOP), endometriosis, eosinophilic granuloma, mucoid impaction, pulmonary hyalinizing granuloma, rheumatoid nodule, sarcoidosis, septic embolus, silicosis, Wegener's granulomatosis

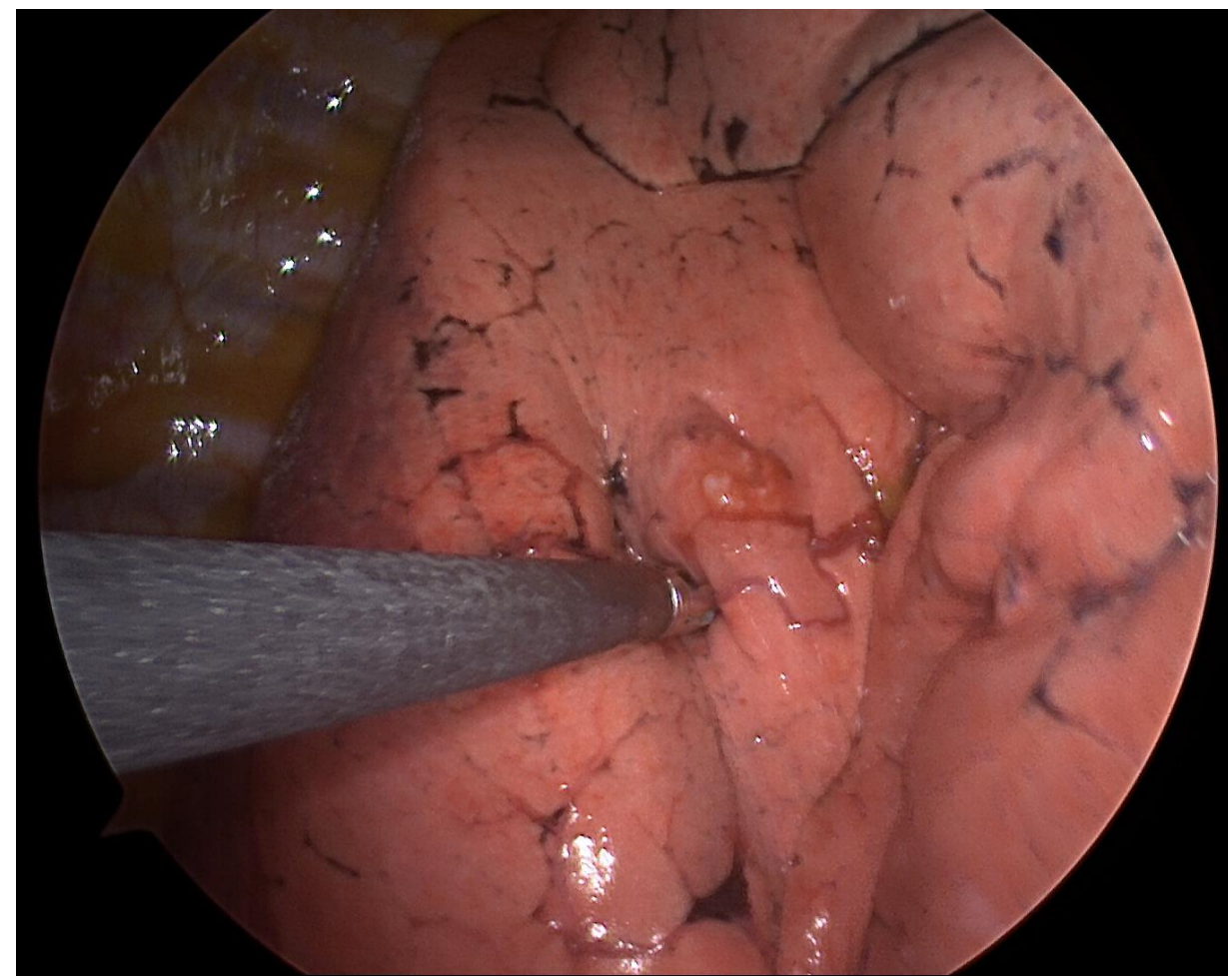
Extrapulmonary densities mistaken for solitary pulmonary nodules by plain film

Blood vessel (dilated or on-end view), bone island, chest wall soft tissue mass, extracorporeal density (e.g., electrocardiographic electrode), overlapping normal structures, nipple shadow, osteophyte, pleural plaque or mass, pseudotumor (fluid in interlobar fissure)

Harmatoma

- Definition
 - Benign, slow growing or self limiting
 - Abnormal mixture of normal tissues and cells from the area in which it grows
 - Composed of cartilage, connective tissue, muscle, fat, and bone





Thanks for Attention