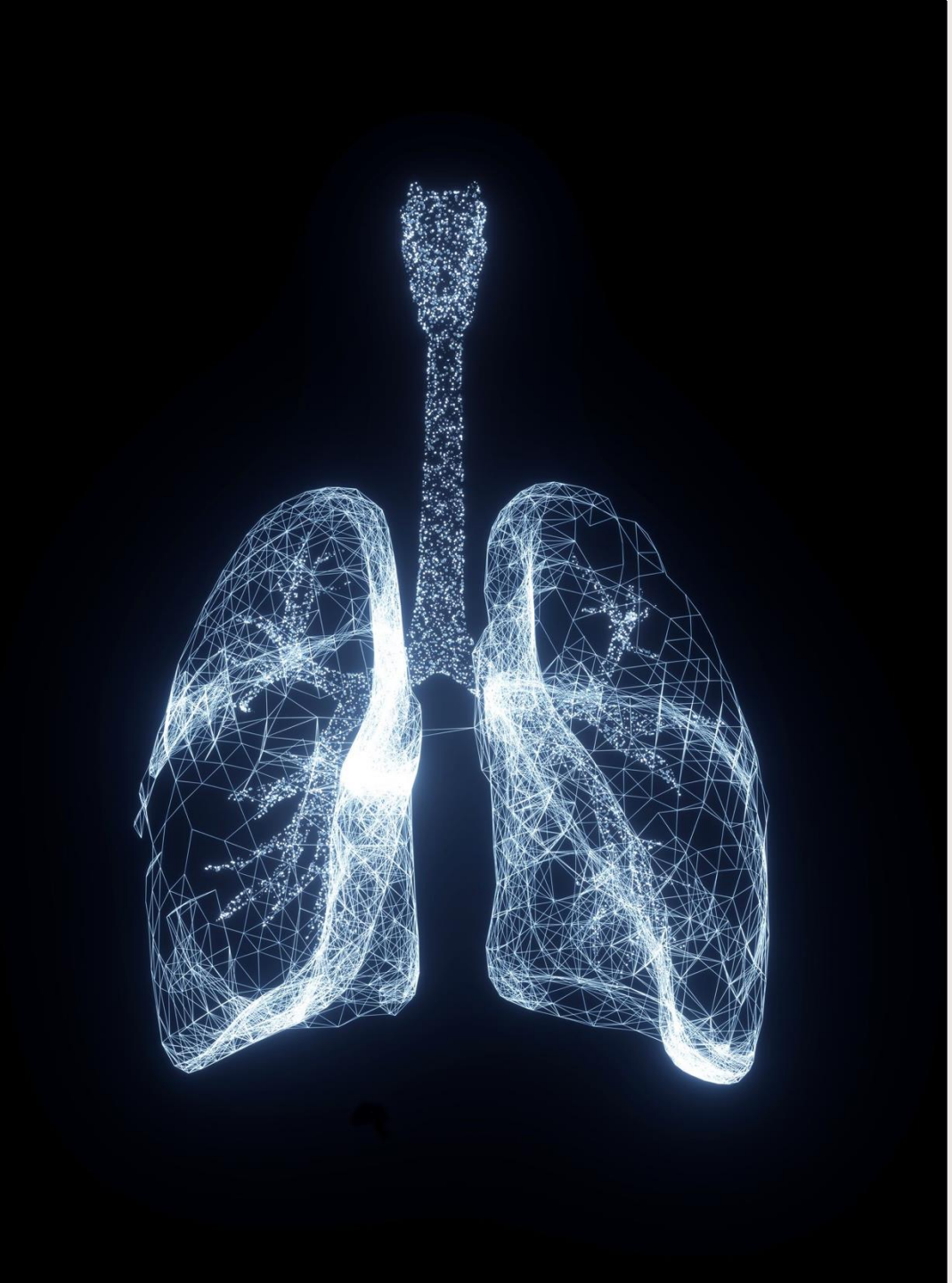


LUNG CYSTS:

A 15-20 MINUTE PRIMER FOR PULMONARY PHYSICIANS

Essential insights into diagnosis and management

Leo C. Ginns, MD

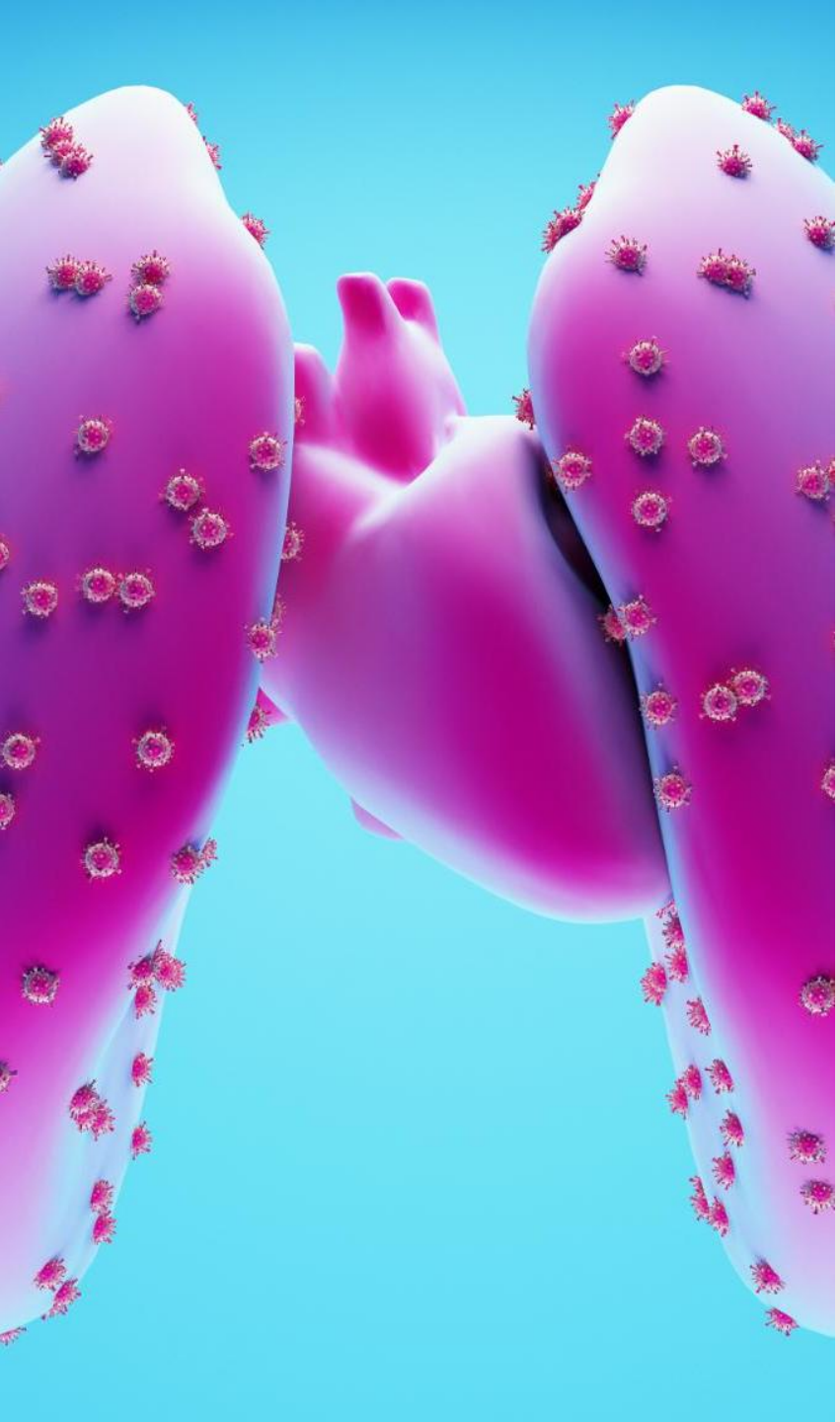
LEARNING OBJECTIVES

Apply	Apply standardized definitions of pulmonary cysts
Differentiate	Differentiate cysts from common CT mimics
Recognize	Recognize major cystic lung diseases and their systemic associations
Integrate	Integrate imaging with clinical decision-making and management

FLEISCHNER SOCIETY CRITERIA FOR PULMONARY CYSTS IN ADULTS

- No separate, dedicated category for “pulmonary cysts”
- Generally, managed under the “subsolid nodule framework”

- **Classification Subsolid nodules** include:
  - **Pure ground-glass nodules** (pulmonary cysts)
  - **Partially solid nodules** (cyst with a small solid component)



PATHOGENESIS OF LUNG CYSTS

Mechanisms of Cyst Formation

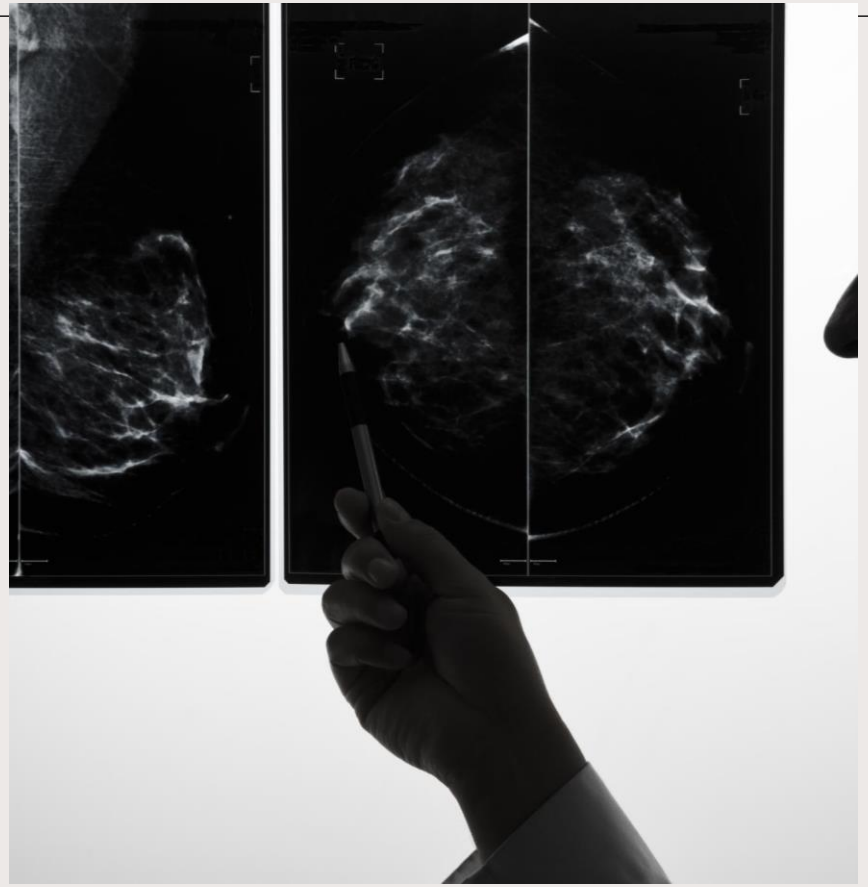
Cysts form due to check-valve obstruction (trapped air), alveolar destruction (inflammatory; smoking-related) or congenital airway abnormalities.

Disease Association

- *Langerhans cell histiocytosis (PLHC) cyst formation results from inflammatory nodules that cavitate as disease evolves.*
- *Lymphangioleiomyomatosis (LAM) causes cystic lung changes via proliferating smooth muscle-like cells infiltrate and weaken airway walls →diffusely distributed round radiolucencies.*
- *Autoimmune processes, e.g. Lymphoid interstitial pneumonitis (LIP) generates cystic spaces through infiltration →remodeling of interstitium*
- ***Clinical Implications***

Understanding cyst pathogenesis aids diagnosis, prognosis, and disease management strategies.

RADIOGRAPHIC MIMICS OF PULMONARY CYSTS



Emphysema Presentation

Emphysema appears as areas of low attenuation on HRCT without distinct walls, often confused with pulmonary cysts.

Bronchiectasis Features

Bronchiectasis shows dilated bronchi with thickened walls, which can mimic cysts but are structurally distinct.

Cavitating Lesion (infection, vasculitis, CA)

Cavitating lesions may resemble cysts but usually have irregular margins and associated nodules on imaging.

Metastatic Cyst-Like Lesions

Certain metastases can form cyst-like lung lesions but usually present with nodules or consolidation nearby

Honeycombing

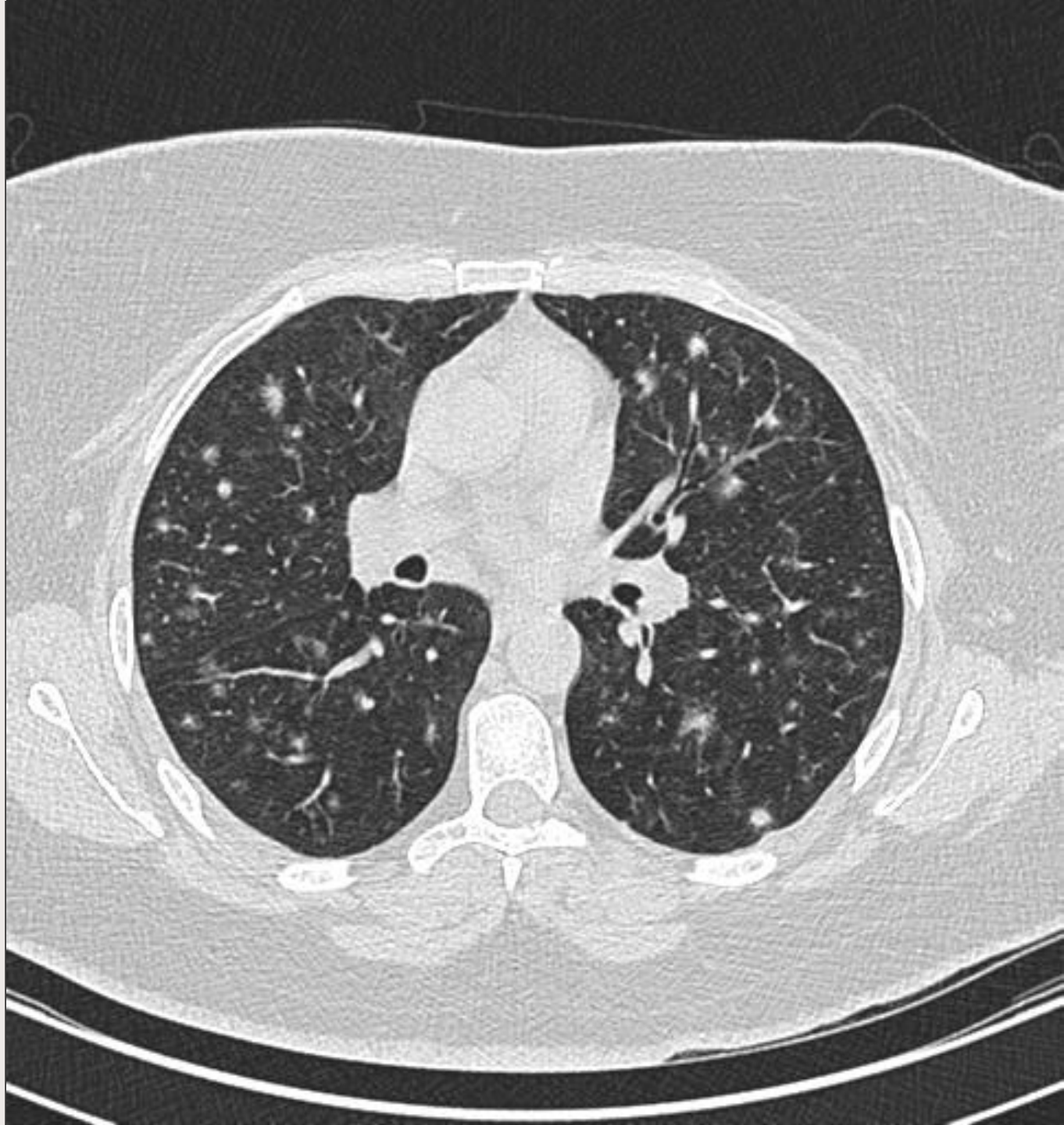
Stacked subpleural cystic spaces with fibrosis

DISTINGUISHING FEATURES OF CYSTIC LUNG DISEASES

DIAGNOSIS	TYPICAL AGE/GENDER	CT PATTERN	DISTINGUISHING FEATURES
LCH	Young adult smokers	Upper-lobe cysts + nodules	Bizarre cysts; smoking-related
LAM	Women 20–40	Diffuse round cysts	TSC association; renal AMLs
BHD	Adults 30–50	Basal/peripheral cysts	Skin fibrofolliculomas; renal tumors
LIP	Middle-aged women	Scattered cysts	Autoimmune disease associations
DIP	Smokers	Ground-glass + cysts	Smoking-related parenchymal disease

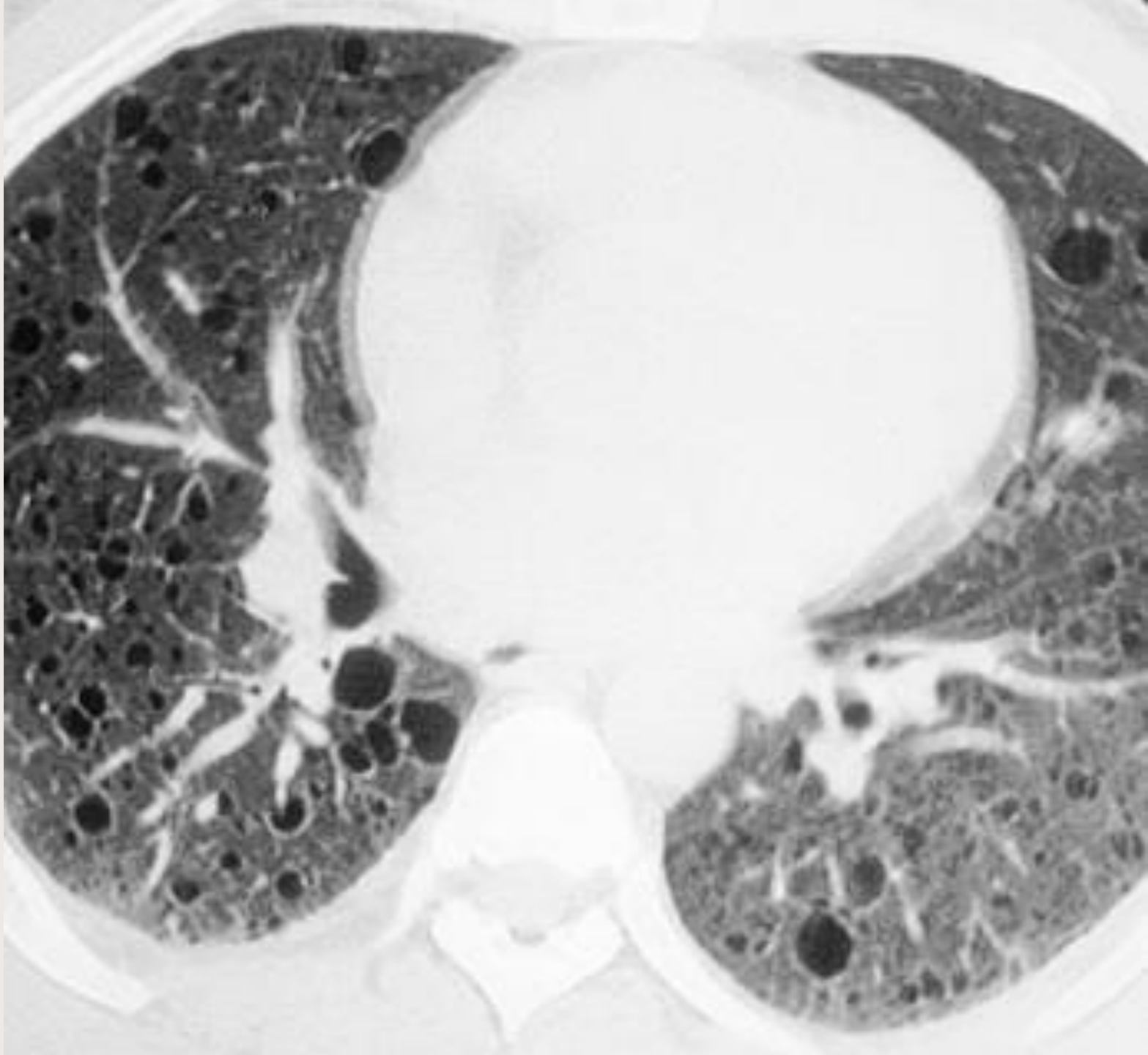
PULMONARY LANGERHANS CELL HISTIOCYTOSIS(PLCH)

- Irregular/bizarre cysts and nodules; cavitating nodules evolve to cyst
- DDX:GPA, Sarcoid, Mets, TBC
- Upper- and mid-lung predominance; sparing of costophrenic angles
- Strong smoking association
- Typically, 20-40 y.o.
- Tx: smoking cessation; steroids in select cases; ? Cladabrine
- Targeted therapies vs. BRAF/MAPK mutations



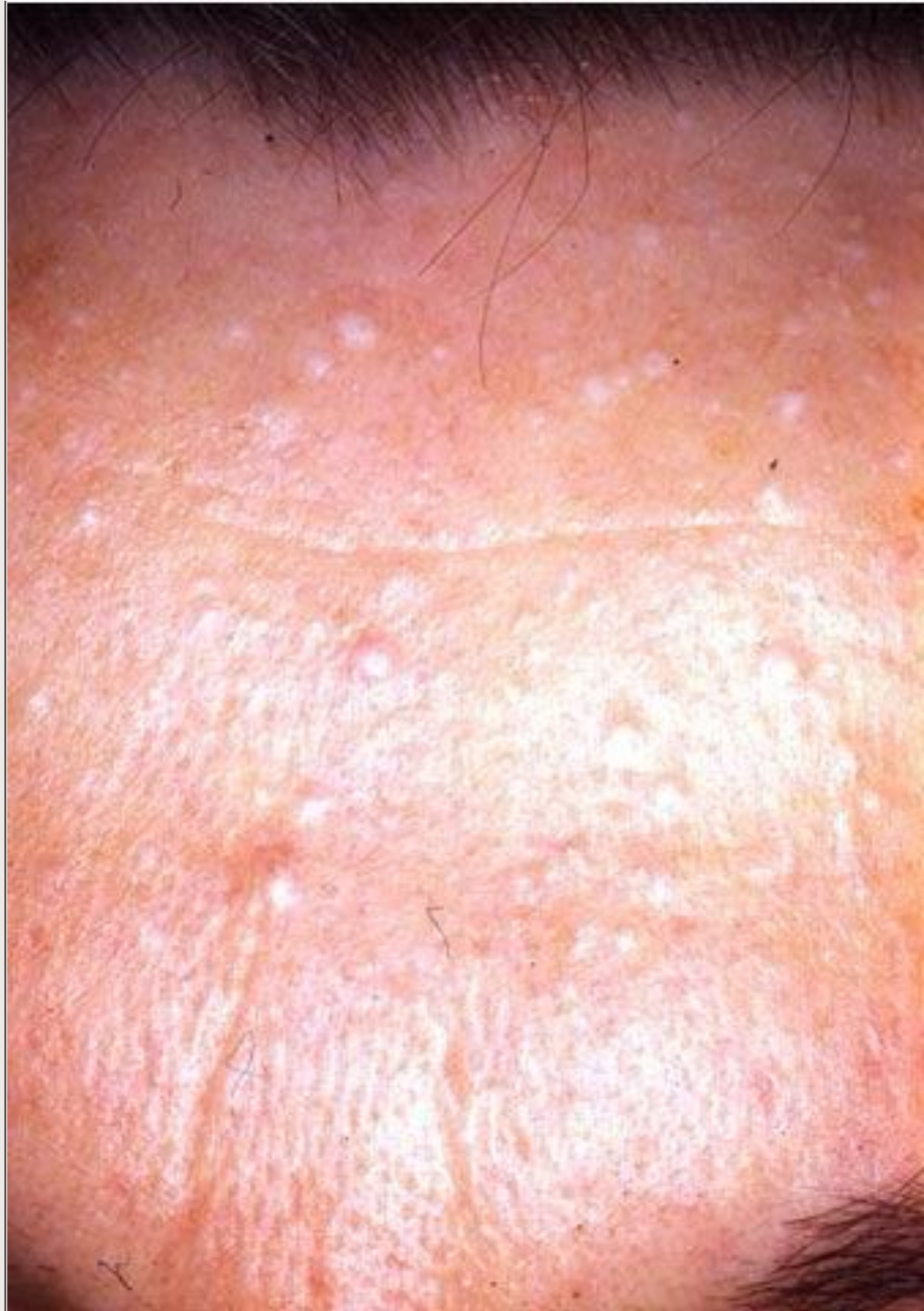
LYMPHANGIOLE-IMYOMATOSIS (LAM)

- Diffuse, uniform, thin-walled cysts
- Without zonal predominance
- Women of childbearing age;
- TSC association
- Recurrent PTX,
- Chylous effusions
- Tx: sirolimus for symptomatic
- Avoid estrogen;
- Transplant in advanced cases



BIRT-HOGG-DUBÉ (BHD) SYNDROME

- Benign skin tumors (fibrofolliculomas)
- Lung cysts, usually bilateral; basal, peripheral
- Pneumothorax
- Increased risk of kidney tumors
- Rare; caused by mutation in FLCN gene, a tumor suppressor gene that makes folliculin



COMPARISON SUMMARY (1/2)

Disease	Distribution	Cyst Morphology	Clinical Clues	Management
LAM	Diffuse, no zonal predominance	Uniform thin-walled	Women, VEGF-D, TSC	Sirolimus; avoid estrogen
PLCH	Upper/mid, spares bases	Irregular/bizarre; nodules	Smoker	Smoking cessation
BHD	Basal, paramediastinal	Oval/lentiform, subpleural	Renal tumors; family hx; skin lesions	Genetics; renal surveillance
LIP	Perivascular/perilymphatic	Thin-walled with GGOs	Autoimmune/Sjögren	Treat underlying; steroids

COMPARISON SUMMARY (2/2)

Disease	Distribution	Cyst Morphology	Clinical Clues	Management
Amyloidosis	Variable	Cysts + calcified nodules	Systemic amyloid	Type-specific therapy
PJP (post-infect)	Upper > lower	Thin-walled pneumatoceles	Immunocompromised	Treat PJP; observe cysts
LCDD	Peribronchovascular	Cysts + nodules	Monoclonal protein	Heme-onc therapy
NF1	Apical > basal	Bullae/cysts	Cutaneous stigmata	Supportive

TAKE-HOME POINTS

- True cysts have definable walls—start there
- Distribution narrows the differential (upper vs basal; central vs peripheral)
- Integrate extrapulmonary clues (renal tumors, autoimmune markers, skin)
- Anticipate complications (pneumothorax) and plan management