SCE Qs 3

INFECTION

Q1

A 54 year old female presents to outpatients with bronchiectasis,, a normal CXR but worsening chronic cough which is tenacious, she is SOB mMRC2, IgG Asp +ve, IgE Asp (precipitans) –ve. Total IgE 240. Sputum +ve for aspergillus. What is this patients diagnosis?

A. ABPA
B. Bronchiectasis with fungal sensitisation
C. Severe asthma with fungal sensitisation
D. Aspergillus Bronchitis
E. CPA

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Aspergillus Bronchitis

Defined as

1. Chronic bronchitis syndrome caused by Aspergillus in the airways
2. Without important tissue invasion/lung parenchymal destruction
3. Without important allergic response.

- Chronic superficial infection of the lower airways (trachea and bronchi)
- Non-immunocompromised

- RFs:
  - the mean age was 54 years
  - majority of patients were female (82%)
  - bronchiectasis (86%),
  - used inhaled corticosteroids (70%) and had
  - mannose-binding lecitin (MBL) deficiency (56%) (Chrdle et al., 2012).
  - 25% had asthma
  - 1/3rd COPD.
  - CF

PC: 2 main phenotypes

1. **chronic productive cough, tenacious mucus production, dyspnoea , difficult airway clearance**
2. **Recurrent exacerbations of preexisting airway disease with marked productive cough that have limited or no response to antibiotics.**

Ref. https://www.aspergillus.org.uk/new_treatment/aspergillus-bronchitis/

CPA can be ruled out based on chest radiology

Aspergillus Bronchitis

- Azoles are the cornerstone of *Aspergillus* bronchitis therapy.
- The use of both itraconazole and voriconazole has been previously reported with good outcomes in non-CF patients.
- 4/12 duration of treatment
- In patients with bronchiectasis, it is not known if AB contributes to airway damage and progression of bronchiectasis.

Q2

You review a follow up patient in clinic. They have asthma on high dose ICS-LABA + LAMA + LTRA and maintained oral pred. They have Total IgE 400, +ve IgE to aspergillus, +ve IgG to aspergillus. CT Thorax shows no nodules. The patient has been started on first line treatment for this condition. What is the most common side effect of the first line treatment?

A. Diabetes
B. Peripheral Neuropathy
C. Low BP
D. Rash
E. Transaminitis

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Severe asthma with Fungal Sensitivities (SAFS)

- Severe asthma (Step 4/5)
- Positive serology: Asp IgE +ve (or any other fungus causing a response)
- No ABPA (Total IgE <1000)
- Imaging CTPA: no nodules/signs of CPA

Should we treat these people??

- Treatment would be with steroids and then antifungals (itraconazole/voriconazole/Posaconazole)

Don't know why it works ?immunomodulation response of antifungals?

- FAST study (Denning et al. Am J Respir Crit Care Med 179 (1); 11-18))
  - Showed an improvement in morning PEFR, AQLQ and fall in total IgE (32 weeks of antifungal
- Antifungal Rx in SAFS (Chishimba er al (journal of asthma 49 2012 (4): 423-433)
  - Showed 6 months of Voriconzaole and Posaconazole over 6 months:
  - 75% less OCS, 40% down graded asthma severity/ reduction in SABA use/ reduction in health care utilisation

Treatment of SAFS

- Optimal asthma care/physio/treat bacterial colonisation
- FULL IgE fungal allergen (cladosporian/tri/penicillium/) and ATOPIC panel
- Trail: itraconazole 3-6 month trial – half inhaled corticosteroid dose after 4-6 weeks (they double the dose on ICS)
- Monitor drug levels (2 weeks/6weeks/4-6 monthly)
- LFTS/U&Es – 2 week/6weeks/3 monthly
- Monitor response: MRC/ACT/Steroid use/asp serology/lung function

- Itraconazole SEs:
  - Peripheral neuropathy
  - Peripheral oedema/HF (negativity inotropic)
  - Adrenal suppression (6 monthly cortisol)
  - Check BP (high – can be a sign of adrenal insuff effect)
  - Think about interaxtion with ICS

Q3

Which of the following is not in ISHAM criteria for the diagnosis of ABPA?

A. Elevated IgE level against Af
B. Type I Asp skin test positive
C. IgE >1000
D. Total eosinophils of >300 in steroid naïve patients
E. All the other criteria are met + IgE of <1000

Q3

Which of the following is not in ISHAM criteria for the diagnosis of ABPA?

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B. Type I Asp skin test positive
C. IgE >1000
D. Total eosinophils of >300 in steroid naïve patients (Total eosinophils count >500 in steroid naïve patients)
E. All the other criteria are met + IgE of <1000

ISHAM Working Group[29]

Predisposing conditions

1. Bronchial asthma
2. Cystic fibrosis

Obligatory criteria (both should be present)

1. Type I *Aspergillus* skin test positive (immediate cutaneous hypersensitivity to *Aspergillus* antigen) or elevated IgE levels against *Af*
2. Elevated total IgE levels (>1,000 IU/mL)*

Other criteria (at least two of three)

1. Presence of precipitating or IgG antibodies against *Af* in serum
2. Radiographic pulmonary opacities consistent with ABPA
3. Total eosinophil count >500 cells/μL in steroid naïve patients (may be historical)

(*If the patient meets all other criteria, an IgE value <1,000 IU/mL may be acceptable)

Q4

What % of asthmatics are found to have ABPA?

A. 2.5%
B. 3.5%
C. 5.5%
D. 7.5%
E. 10.%

Q4

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Who will have elevated Asp IgE on testing??

- 30% Asthmatics
- 13% COPD
- 65% CF

ABPA

- CT imaging : Bro
  small airway obs

First line: Oral glucocortic
- Dose: 0.5mg/kg 2 weeks t
  5mg/fortnight
- Validated by open-label tri
- Toxicity issues often limitir
- Alternative: Pulse intraven
  European Respiratory Revi
  - Potential for reduced steroi

- Second line: Antifungal therapy
- Azoles
  - Itraconazole validated by placebo-controlled trials itraconazole
    - Stevens DA, N Engl J Med 2000; 342:756-762
    - Wark PA, J Allergy Clin Immunol 2003; 111:952-957
  - Voriconazole used in numerous case reports and case series
    - Chishimba L, J Asthma 49(4):423-433
  - 2 small studies suggest itraconazole and voriconazole are as effective as prednisolone in treatment for acute ABPA
    - Agarwal R, Chest 2018 Mar;153(3):656-664
    - Agarwal R, Eur Respir J 2018; 52: 1801159
  - Posaconazole – case series, most often used in CF
    - Periselneris J, J Antimicrob Chemother 2019; 74: 1701-1703
  - Frequent toxicities. Absorption, metabolism, drug interactions, mandate drug level monitoring; resistance increasing
- Nebulized Amphotericin B
  - Inhaled Ambisome 10mg BD, caution - bronchospasm
    - Otu A, Mycosis 2019; 62: 1049-1055
    - Godet C, Eur Respir J 2012; 39: 1261-1263

Ref: Baxter C 2020 NW and Mesery Dearnery ABPA/ SAFS - Caroline BaxterABPA talk

Antifungals

- Voriconaole: photosensitivities/halluncinairons/visual disturbance/acute hepatitis/ecg – prolonged QTc
- Posiconazole: GI disturbance/hair loss/neuropathy
  - Itraconazole:
    - Peripheral neuropathy
    - Peripheral oedema/HF (negativity inotropic)
    - Adrenal suppression (6 monthly cortisol)
    - Check BP (high – can be a sign of adrenal insuff effect)
    - *Think about interaction with ICS*

Follow up

- **Sputum/annual Xray/annual PTFs/6 monthly cortisol/check BPs/drug levels**
- **Monitor drug levels (2 weeks/6weeks/4-6 monthly)**
- **LFTS/U&Es – 2 week/6weeks/3 monthly**

Disease	AB	ABPA	CPA	INVASIVE ASP
Host factors	Chronic airway disease (bronchiectasis/asthma/ COPS	Asthma or CF	Asthma, COPD, bronchiectasis, lung sequelae (TB /sarcoidosis)	Significant immunosuppresion, neutropenia, transplantation
Onset	Subacute/chronic	Chronic	Chronic	Acute
Systemic symptoms	Uncommon	Uncommon	Common	Common
Resp symptoms	Cough/thick phlegm/plugs	Productive cough, mucus plugs, wheeze, SOB	Productive cough, haemoptysis, dyspnoea	Mild and nonspecific
Chest imaging	Bronchiectasis	Airway obstruction with mucus, central bronchiectasis	Progressive cavity formation, fibrosis, lung volume loss, aspergillomas, nodules	Halo and air crescent signs, consolidation, pleural based sharp edged consolidation
Asp IgG and precipitans	+ve or –ve	Positive or negative	+ve	-ve may seroconvert
Sr IgE	Normal or mild elevation	>1000	Normal or mildly +ve	Occasionally +ve
Asp IgE	Negative	Positive	Low level +ve	No data

Q5

A 49 year old man presents to ED he is admitted for a uncomplication CAP which required 48 hours of IV abx, non smoker, and he was then discharged. The GP called u 4 weeks later, and is worried that patient remains SOB and asks what follow up is required for this gentleman?

A. Basic repeat bloods with CRP and WBC
B. 6 week CXR
C. No follow up required reassure GP
D. Pneumonic clinic or similar follow up at 6 weeks
E. Repeat sputum culture

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A. Basic repeat bloods with CRP and WBCs
B. 6 week CXR
C. Reassure GP + no follow up required
D. Pneumonic clinic or similar follow up at 6 weeks
E. Repeat sputum culture

- If <50 years and no smoking history patients do not need a follow up CXR
- Takes 3/12s to improve symptoms following severe CAP

Immunology

Q1.

31 year old man presents to ED with an exacerbation of bronchiectasis he tells u he is known to be colonised with aspergillus and pseudomonas. He is currently on septrin and itraconazole prophylaxis and has regular IgG replacement therapy. He tells u he has suffered with ill health since childhood with recurrent skin and chest infection as well as atopic eczema. His bloods reveal a Hb 110, WBC 11 platelets 320, eosinophils 0.8, total IgE 700, CRP 30. You send off an immunoprofile screen but are awaiting the results. What underlying disease does this patient most likely suffer from?

A. HyperIgE syndrome
B. ABPA
C. CVID
D. Specific IgG Deficiency
E. Good's syndrome

Ans1.

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A. HyperIgE syndrome (genetic panel for diagnosis)
B. ABPA
C. CVID
D. Specific IgA Deficiency
E. Good's syndrome

Ans 1.

- Goods: thymoma with Ab deficiency, late onset combine T&B cell immune deficiency, thymectomy, recurrent sino-pul infection bronchiectasis and chronic sinusitis not uncommon, increased risk of CMV end organ disease and muco-cutaneous candidiasis, auto immune disease associated.
- Partial or specific polysaccharide Ab Deficiency: recurrent sino-pul and ear infection, pneumococcus and haemophilus, normal sr immunoglobulins, impaired response to carbohydrate based vaccine (pneumococcal vaccine) , normal response to protein based vaccines (tetanus toxoid), normal B cell count. Rx: longer courses of Abx
- CVID: recurrent sino-pul infection with encapsulated organisms – pneumococcus, haemophilus, rhinovirus. 40% bronchiectasis, commonly have autoimmune disorders IPT, AIHA, thyroid disease).
- Hyper IgE syndrome: present YOUNG with impaired IL-6 signalling, LOF of STAT3 genetics, atopic eczema, staph and fungal skin and chest infection, minimal trauma fractures, structural vascular disease. Bronchiectasis and pneumatoceles - aspergillus and pseudomonas, eosinophilias. Raised IhE, reduced class switched memory B cells and absent CD 3 Th17 Tcells.
- Selective IgA deficiency: most common, particularly in SPAIN, most asymptomatic, risk of allergic disorder, and sinopul disorders,

Immunoglobulin replacement

- Only replace IgG
- IgG pre contains Ab to pneumococcus, haemophilus, measles, mumps and Hep A and Hep B
- SE: Flu like symptoms, rash, wheeze
- Give to CVI and XLA and thymoma patients
- Give to patient with partial ab syndrome who have severe infection, failure to respond to vaccines, trial of 6 month of quick treatment with abx which failres.
- Acquired immunodeficiency IgG <4, failure of response to vaccines, infections.

Q2

- What mutation is the most likely cause of XLA antibody def syndrome?

A. BTK
B. JAK 3
C. RAG-1
D. CD40LG
E. CYBB

Q2

- What mutation is the most likely cause of XLA antibody def syndrome?

A. BTK (XLA)
B. JAK 3 (CVID)
C. RAG-1 (severe combine immunodef)
D. CD40LG (T cell defect)
E. CYBB (chronic granulomatous disease)

Drugs which affect immunoglobulins to remember

- Rituximab: selectively depletes IgG and IgM
- Prednisolone: IgG more than others

1. Which of the following is the least established cause of bronchiectasis

A. Youngs syndrome
B. Rheumatoid arthritis
C. Ulcerative colitis
D. Immunodeficiency
E. Crohn’s Disease

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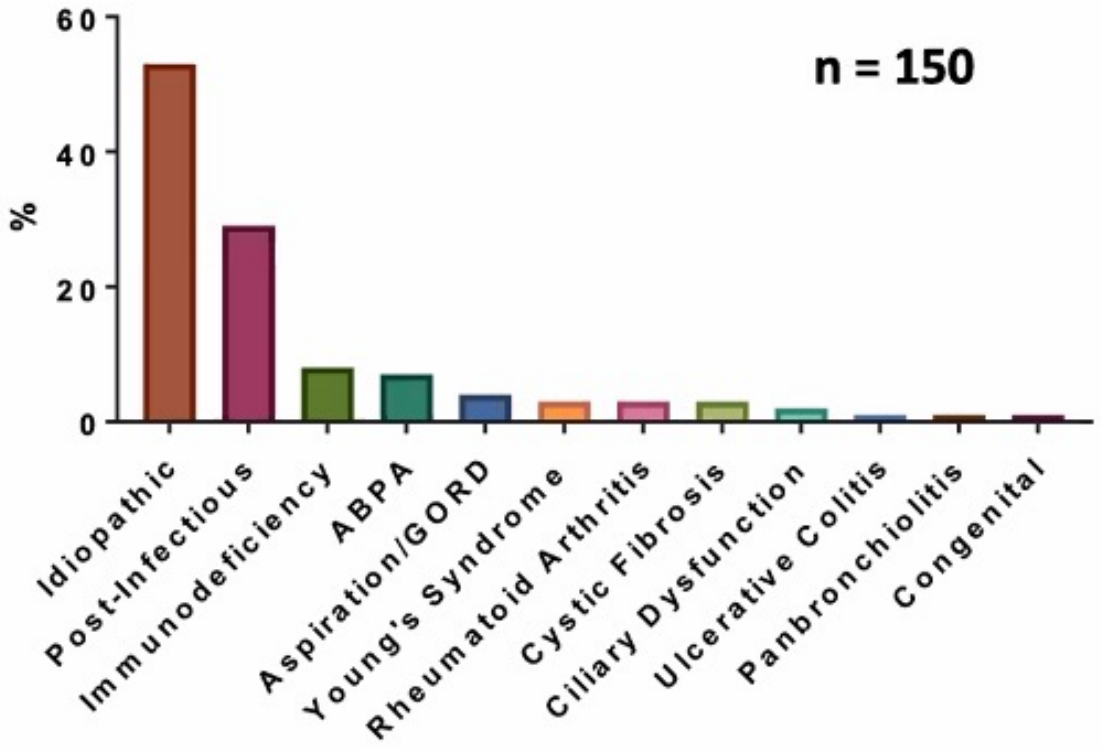
- IBD has been well recognised as an association (although rare) with bronchiectasis. In particular, this is true of ulcerative colitis.

- both IgA producing B cells and T cells are believed to migrate from the gut to the lung

- Crohn's disease has a less well recognised association with bronchiectasis than ulcerative colitis,

- neutrophil infiltration has often been implicated in the pathogenesis of the tissue destruction of both ulcerative colitis and Crohn's disease and, of course, the same has been true in bronchiectasis



Pasteur AJRCCM 2000

Commentary: bronchiectasis and IBD R A Stockley Thorax 1998

Q2.

Which of the following is a cause of azoopermia (change wording to a case)

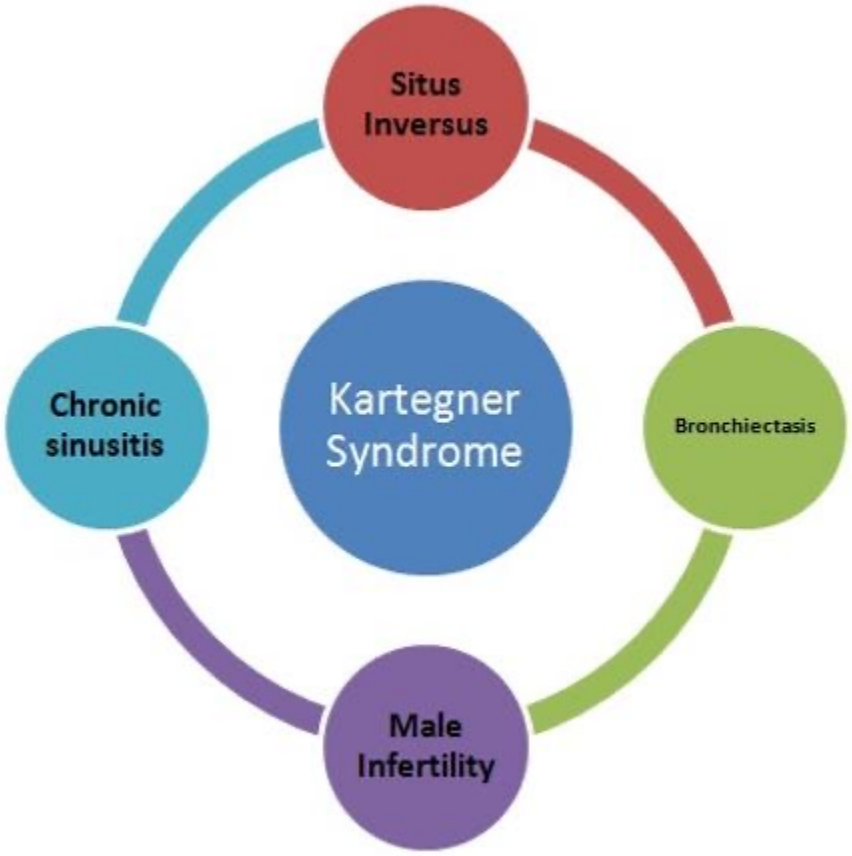
A. Young syndrome
B. A1AT
C. Katagener’s syndrome
D. Bronchiectasis
E. Primary Cilliary Dyskinesia

Q2 A – Young's syndrome

- **Sinusitis-infertility syndrome**, is a rare inherited **syndrome** similar to **Kartagener syndrome**.
- Young syndrome is a **condition characterized by male infertility, damaged airways in the lungs** (bronchiectasis), and inflammation of the sinuses (sinusitis). secondary to obstructive azoospermia, a condition in which sperm are produced but do not mix with the rest of the ejaculatory fluid, due to a physical obstruction in the epididymis (tube through which sperm exit the testis). This results in non-existent levels of sperm in semen
- Also see azoospermia in CF
- In kartangeners and PCD (which are same but Kartanheners is juust PCD with situs invertus) – u see sperm are present but mobile)
- The exact cause of Young syndrome has not been identified, it is believed to either be related to childhood exposure to mercury or genetic factors.
- The diagnosis of Young syndrome is based on the presence of signs and symptoms and the absence of other similar conditions, such as cystic fibrosis and primary ciliary dyskinesia.[1]

Kartagener's syndrome

- **rare, autosomal recessive genetic ciliary disorder** comprising the triad of situs inversus, chronic sinusitis, and bronchiectasis. The basic problem lies in the defective movement of cilia, leading to recurrent chest infections, ear/nose/throat symptoms, and infertility.
- Like PCD/Kartageners cause infertile due to ciliary dysfunction rather than azoospermia



Q3

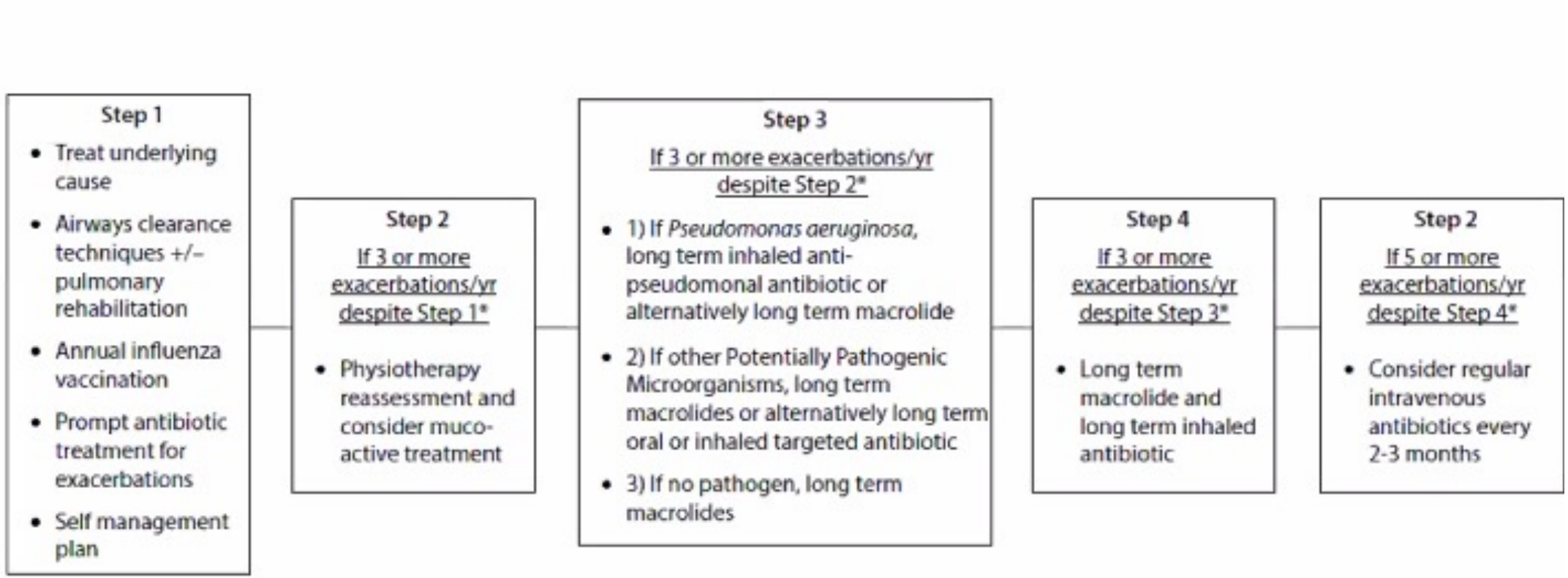
A 56 year male attends chest clinic with his son, he has an established diagnosis of bronchiectasis secondary to influenza pneumonia as a baby. He complains of increased SOB since last review and has required 4 course of antibiotics via his GP and had 2 hospital admission in the last 12 months. He has est chronic pseudomonas infection. His mMRC is 3 and his FEV1 49%, his sputum production is purulent but not increased in volume or colour from dark yellow, he gets occasional haemoptysis . Sats 93%, HR 72, BP 132/61. He is a non smoker, he has completed pulmonary rehab, he does reg chest clearance, carbocistine, azithromycin, colimycin nebs. What would the most appropriate next management step be?

A. Ref for transplantation
B. Consideration of IV cyclical antibiotics
C. Admission for acute exacerbation
D. Ref for sweat treat
E. Consider bronchoscopy

Q3

A. Transplant: no his FEV1 is too high. Although in practice u might consider referring at this point, its not the most appropriate on the list
B. Consideration of IV cyclical antibiotics: yes, he is at maximum Rx for his bronchiectasis, if colimycin and azithromycin haven't worked and his is having more the 5 exacerbation in a year you should consider IV cyclical abx
C. Admission for acute exacerbation: sputum is unchaged, Obs stable, and this seems like a more progressive decline over months.
D. Ref for sweat treat: no other features apart from bronchectaiss to make u consider this diagnosis
E. Bronchschopy: consider this when localise disease and to rule out endobronchial lesion or foreign body

Principles of management in bronchiectasis



BTS Bronchiectasis Guideline 2019

Q4

A 31 year old male comes to clinic, he has been referred by his GP due to tenacious sputum production, he is a smoker and smokes cannabis and cigarettes, and recurrent LRTI since childhood.

PMHx: GORD, rhinosinusitis and recurrent otitis media, he was born prematurely and had neonatal distress at birth. HRCT shows upper lobe emphysema and cylindrical bronchectaiss and he is currently undergoing fertility tests with his wife. Which of the following test would most likely give u the diagnosis underlying this mans bronchiectasis

A. Sweat test
B. A1AT deficiency
C. Nasal NO
D. CXR to look for dextrocardia
E. 3 sputums of AFB including at least 1 early morning sample

Q4

A. Sweat test: this could be CF but no features of pancreatic insufficient, faltering growth, the otitis media and neonatal distress are more features of PCD. Patient has a son with him in clinic.

B. A1AT deficiency: think of this in Panacinar emphysema were all portions of the acinus and secondary pulmonary lobule more or less uniformly afected. It predominates in the lower lobes and is the form of emphysema associated with1-antitrypsin deficiency.

C. Nasal NO: Yes, this is the test for PCD, neonatal distress, symptoms from childhood, recurrent otitis media are the features which make this the most likely diagnosis here

D. CXR to look for dextrocardia: trying to confuse u and consider Kartengers, the test for kartengers would be a genetic test for diagnosis.

E. 3 sputum of AFB including at least 1 early morning sample: wrong, no features of TB

Q5

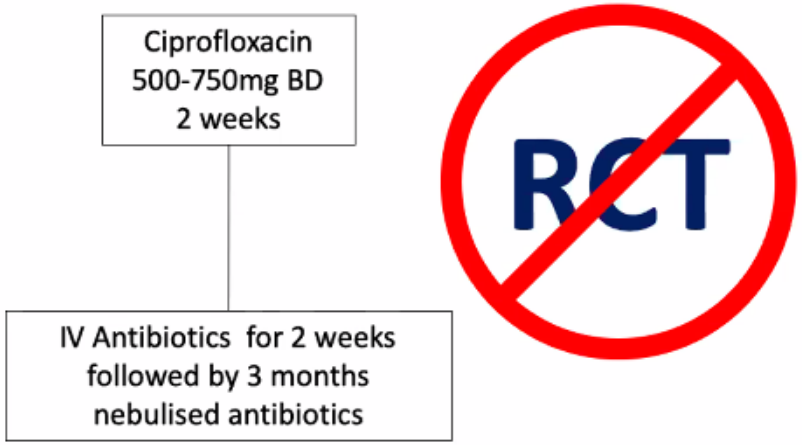
A patient with an established diagnosis of bronchiectasis comes to clinics. There symptoms have progressed and they feel more fatigued, and have lost a little weight. The SOB is stable but they have more phlegm and their last sputum results shows a new growth of pseudomonas aer. What would be the most appropriate management for this?

A. Ciprofloxacin 500 BD 2/52 and 3/12 of nebulised colimycin.
B. Re-send another sputum, u need 2 out of 3 to be positive before u start any treatment
C. Ciprofloxacin 500 BD 2/52 and 6/12 of nebulised colimycin.
D. Ciprofloxacin 500 BD 4/52 and 3/12 of nebulised colimycin.
E. Clarithromycin 500BD 2/52 and 3/12 of nebulise colimycin

Q5

A. Ciprofloxacin 500 BD 2/52 and 3/12 of nebulised colimycin.
B. Re-send another sputum, u need 2 out of 3 to be positive before u start any treatment. This is true to NTM no pseudomonas
C. Ciprofloxacin 500 BD 2/52 and 6/12 of nebulised colimycin.
D. Ciprofloxacin 500 BD 4/52 and 3/12 of nebulised colimycin.
E. Clarithromycin 500BD 2/52 and 3/12 of nebulise colimycin

Pseudomonas Eradication in Context of Clinical Deterioration BTS Guideline 2019



Q6

- A 80 year old man with bronchiectasis comes to clinics and wants to know what his 1 year mortality rate is? He has an FEV1 of 50, has 1 hospital admission this year which was his only exacerbation in the last year, his MRC score is 4, he is colonised with pseudomonas only, he has multi-lobar bronchiectasis on CT imaging with all lobes affected. According to the bronchiectasis severity index what is his 1 year mortality risk?

A. 1%
B. 5%
C. 10%
D. 20%
E. 30%

Q6

- A 80 year old man with bronchiectasis comes to clinics and wants to know what his 1 year mortality rate is? He has an FEV1 of 50, has 1 hospital admission this year which was his only exacerbation in the last year, his MRC score is 4, his BMI is normal, he is colonised with pseudomonas only, he has multi-lobar bronchiectasis on CT imaging with all lobes affected. According to the bronchiectasis severity index what is his 1 year mortality risk?

A. 1%
B. 5%
C. 10%
D. 20%
E. 30%

Bronchiectasis severity scores

- The Bronchiectasis Severity Index (BSI) (Chalmers et al 2014) was also found to give excellent predictions of hospital admissions, exacerbations and quality of life.
- He scores 18!

Severity Marker	Score Points	
Age, yr		
<50	0	
50–69	2	
70–79	4	
80+	6	←
BMI		
<18.5	2	
18.5–25	0	←
26–29	0	
30 or more	0	
FEV_1 % predicted		
>80	0	
50–80	1	←
30–49	2	
<30	3	
Hospital admission before study		
No	0	
Yes	5	←
Exacerbations before the study		
0	0	
1–2	0	←
3 or more	2	
MRC dyspnea score		
1–3	0	
4	2	←
5	3	
Pseudomonas colonization		
No	0	
Yes	3	←
Colonization with other organisms		
No	0	
Yes	1	
Radiological severity: ≥3 lobes involved or cystic bronchiectasis		
No	0	←
Yes	1	

Bronchiectasis Severity Score (calculated from results of the above criteria)

0- 4 Mild Bronchiectasis

1 year outcomes: 0 – 2.8 % mortality rate, 0 – 3.4 % hospitalisation rate

4 year outcomes: 0 – 5.3 % mortality rate, 0 – 9.2 % hospitalisation rate

5 – 8 Moderate Bronchiectasis

1 year outcomes: 0.8 – 4.8 % mortality rate, 1.0 – 7.2 % hospitalisation rate

4 year outcomes: 4 % – 11.3 % mortality rate, 9.9 – 19.4 % hospitalisation rate

9 + Severe Bronchiectasis

1 year outcomes: 7.6 % – 10.5 % mortality rate, 16.7 – 52.6 % hospitalisation rate

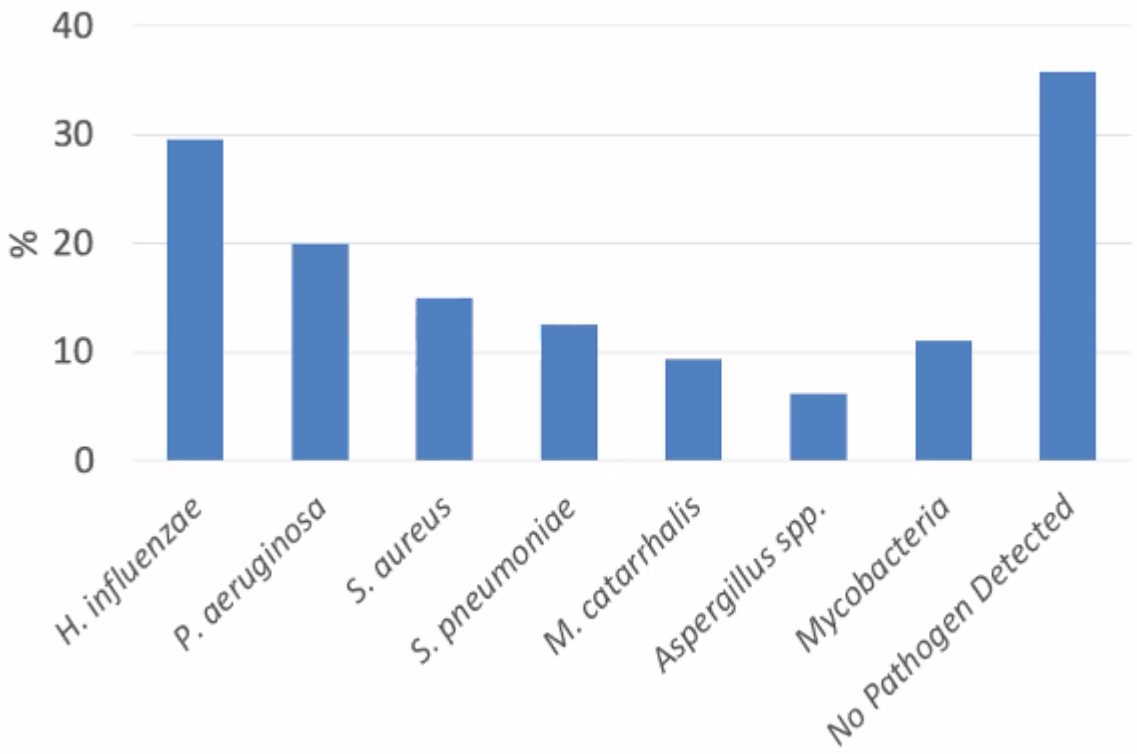
4 year outcomes: 9.9 – 29.2 % mortality, 41.2 – 80.4 % hospitalisation rate

Bronchiectasis – things to remember

1. 3 exacerbation or more despite the current step is a reason to move up a step in treatment until step 5 where is 5 exacerbation
    1. Step 1 is just prompt abx
    2. Step 2 is a mucoactive treatment/physio
    3. Step 3 long term macrolide, or if u have pseudomonas or other sp growth target that
    4. Step 4 is long term macrolide AND inhaled abx
    5. Step 5 in cyclical IV abx (every 3/12)

Bronchiectasis – things to remember

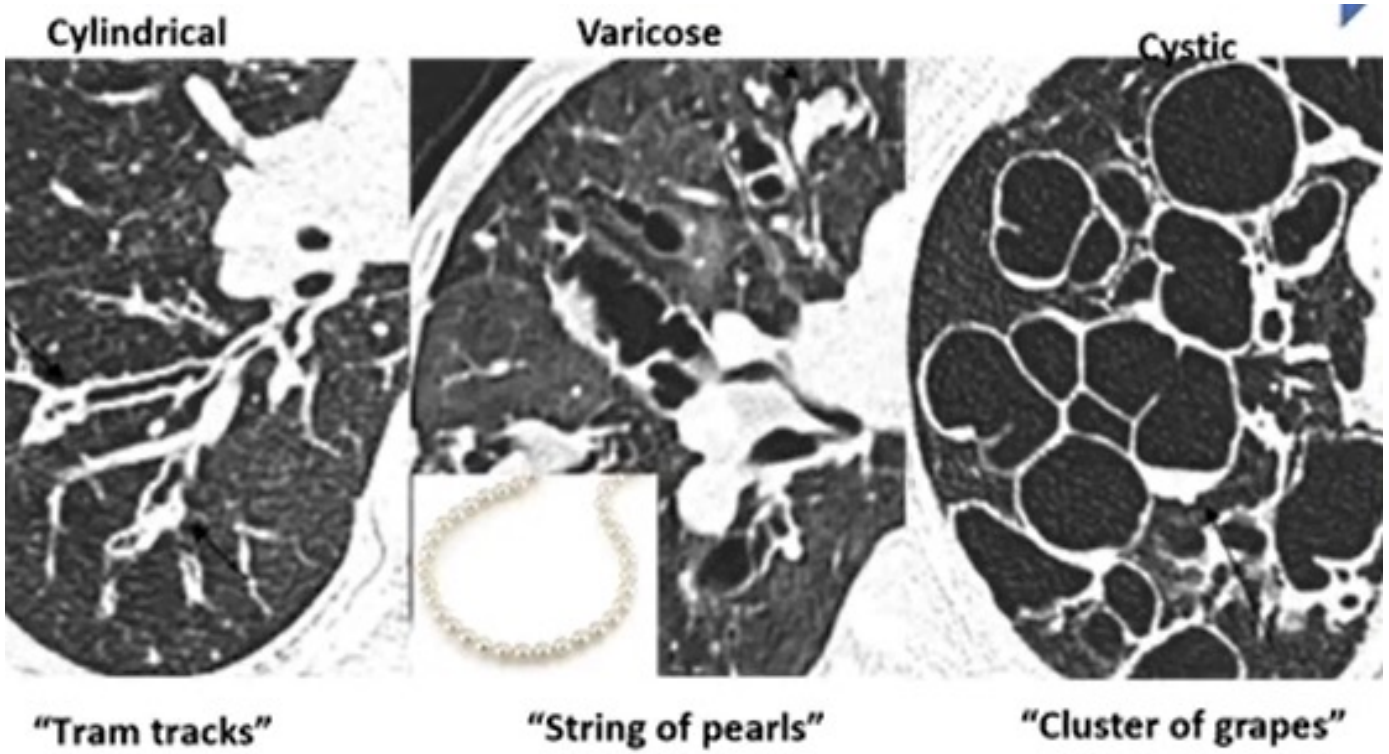
- most common pathogens
  1. No pathogen
  2. H. influenza
  3. Pseudomonas aeruginosa
  4. Staph aureas
  5. Strep pneumonia



Ref: EMBARC – pooled data from 19 studies & 2601 pts

Bronchiectasis – things to remember

- Progression of bronchiectasis



Pleural SCE Qs

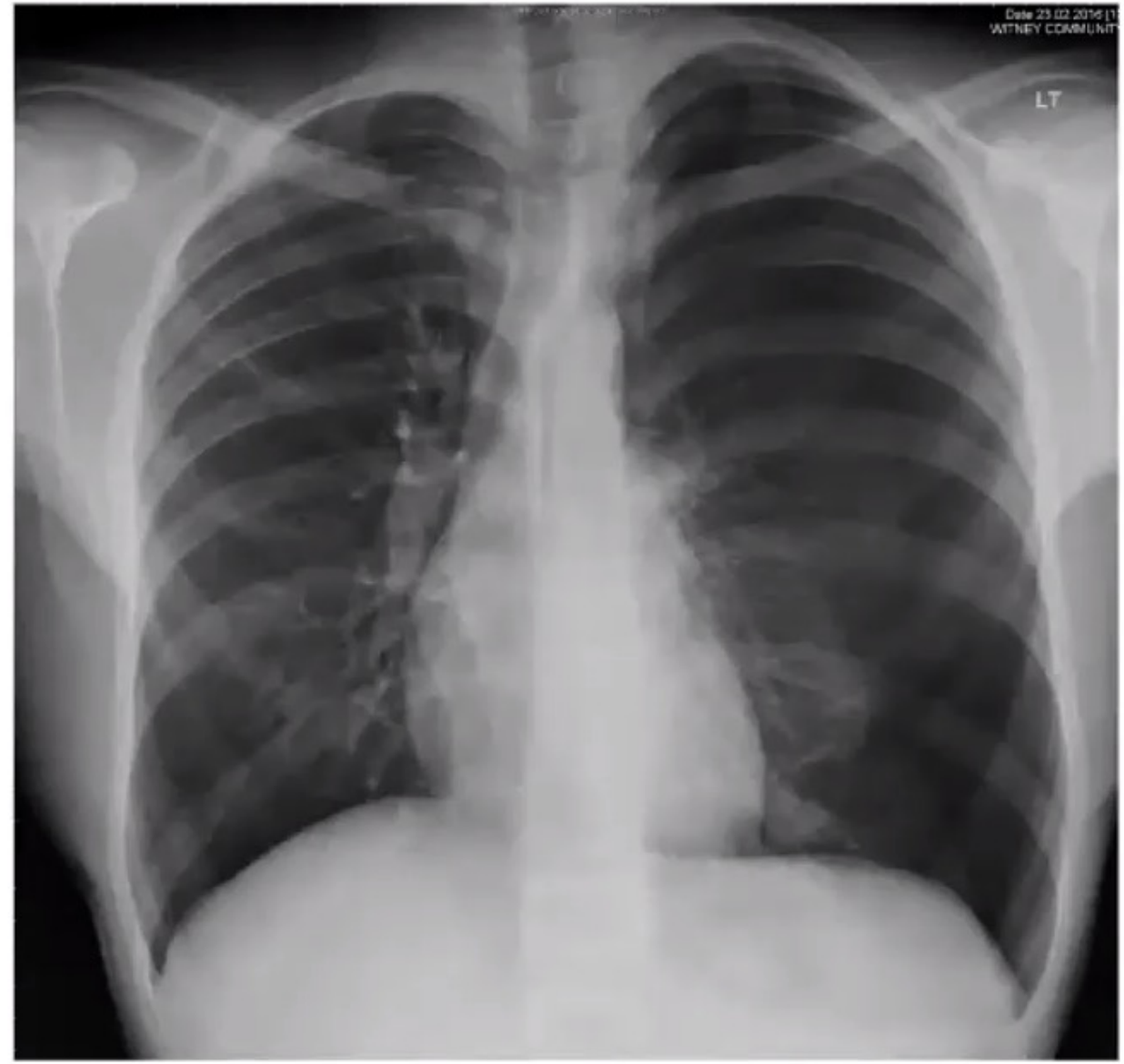
A 26 year old man is admitted with a 1 day history of chest pain.

He has no medical history but smokes cigarettes since the age of 15.

Observations and stable and saturations are 97% on air.

What treatment should be offered first?

a) Observation
b) Admit for oxygen therapy
c) Needle Aspiration
d) 12F intercostal drain and admit
e) Thoracic surgery



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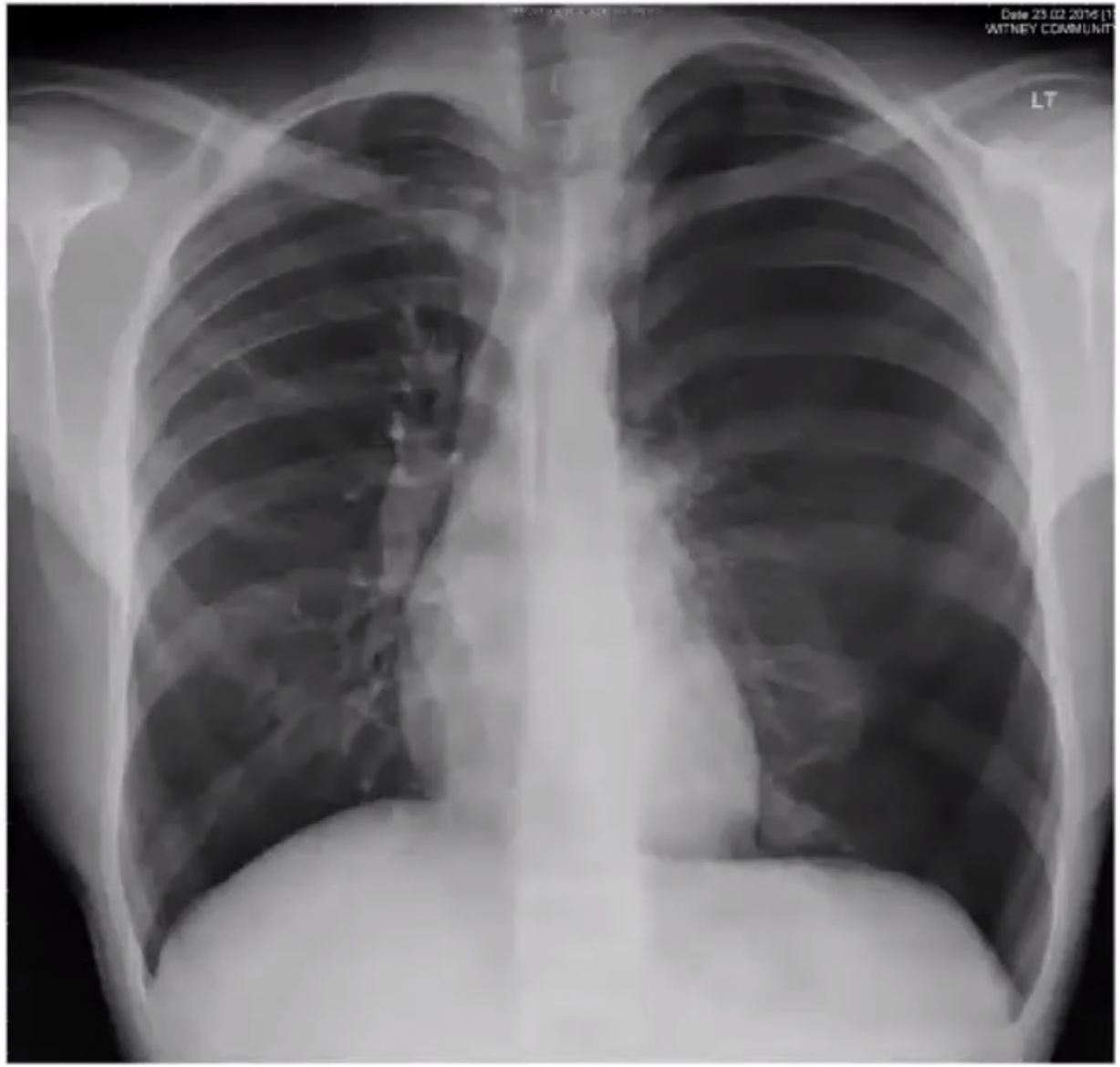

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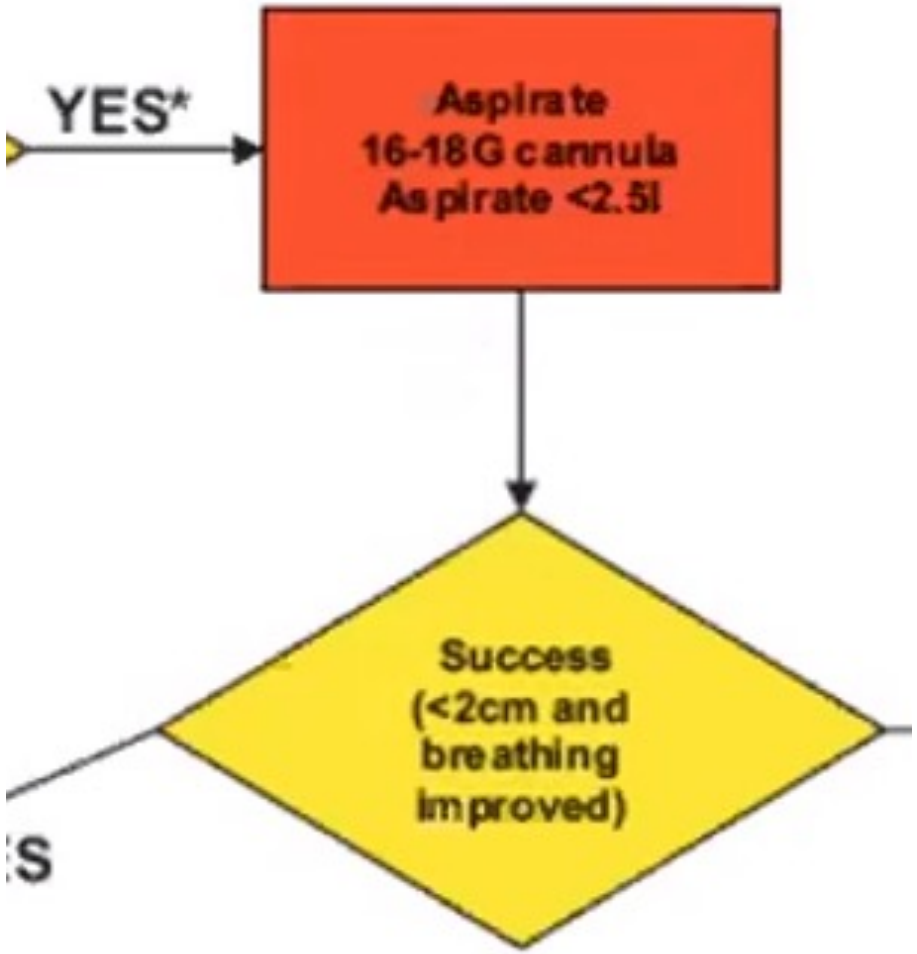
a) Observation
b) Admit for oxygen therapy
c) Needle Aspiration
d) 12F intercostal drain and admit
e) Thoracic surgery

C

Primary spontaneous

- If asymptomatic then discharge if small

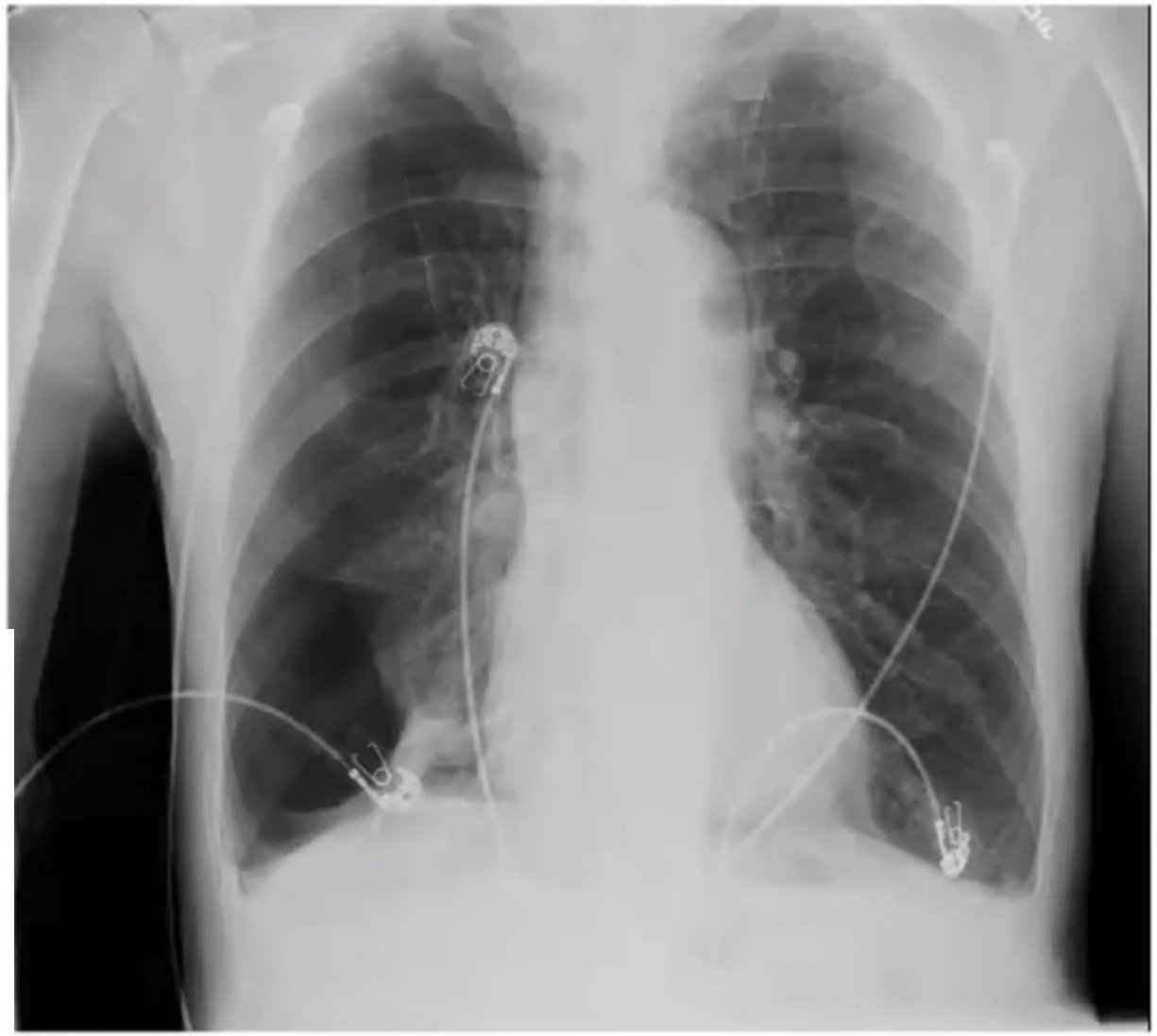
*In some patients with a large pneumothorax but minimal symptoms conservative management may be appropriate



A 74 year old woman is admitted with breathlessness.

She has a history of severe COPD on triple inhaler therapy. ET 30 metres, home oxygen as required.

Saturations 86% on air.



What treatment should be offered as first line?

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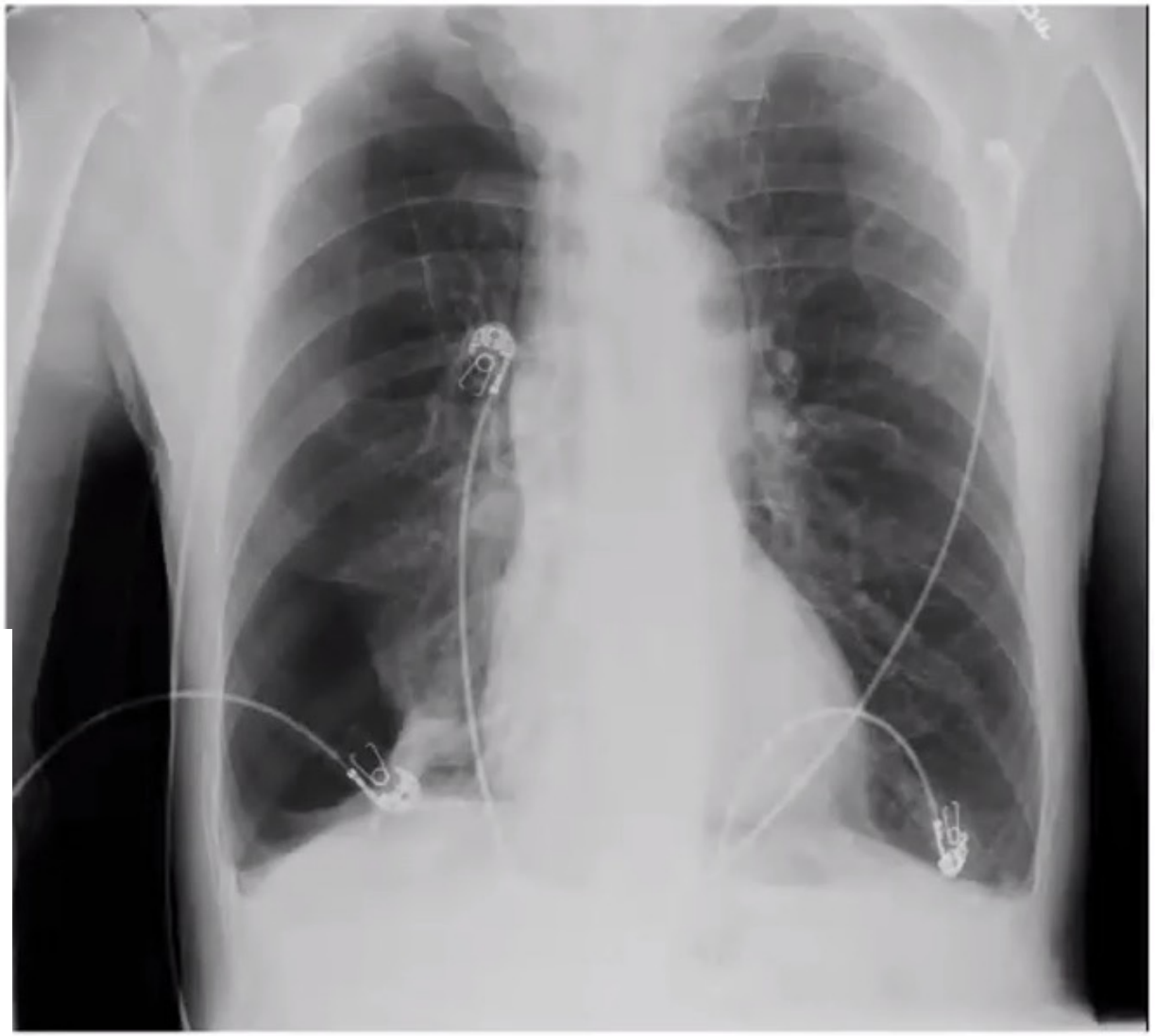

What treatment should be offered as first line?

a) Observation
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D

17 year old man was admitted 2 weeks ago with a spontaneous right pneumothorax, treated conservatively. You see him in the outpatient clinic and the CXR now shows complete resolution. He wishes to go on holiday to Italy. What do you advise him about flying?

a. He is safe to fly within 24 hours
b. He can never fly
c. He can fly after 1 week
d. He can fly after 6 weeks
e. He can fly after 3 months and a repeat CXR

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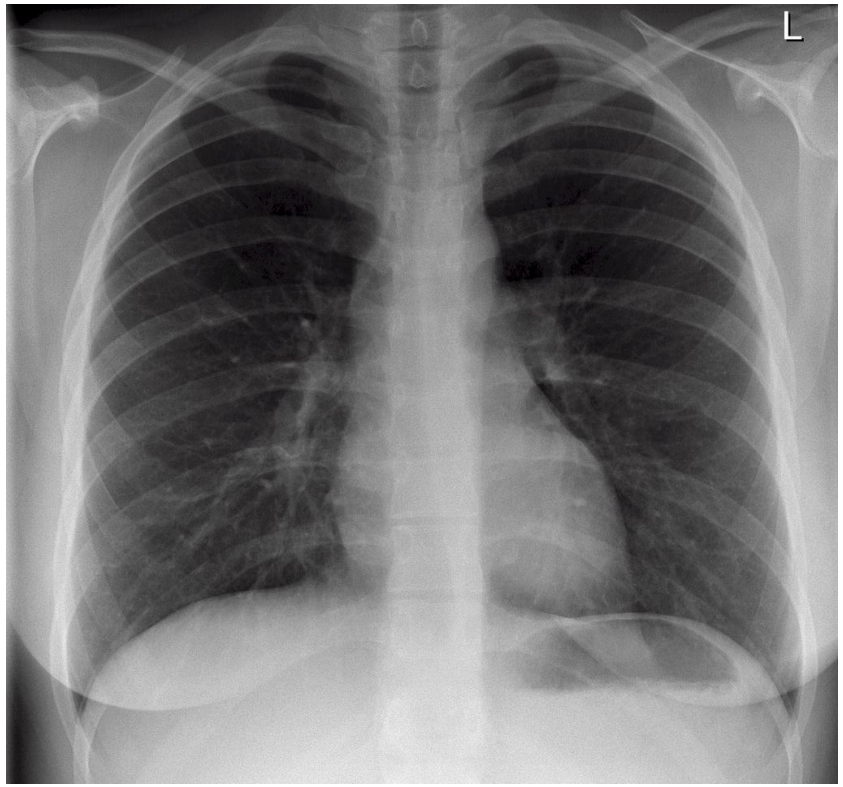
c. He can fly after 1 week
d. He can fly after 6 weeks
e. He can fly after 3 months and a repeat CXR

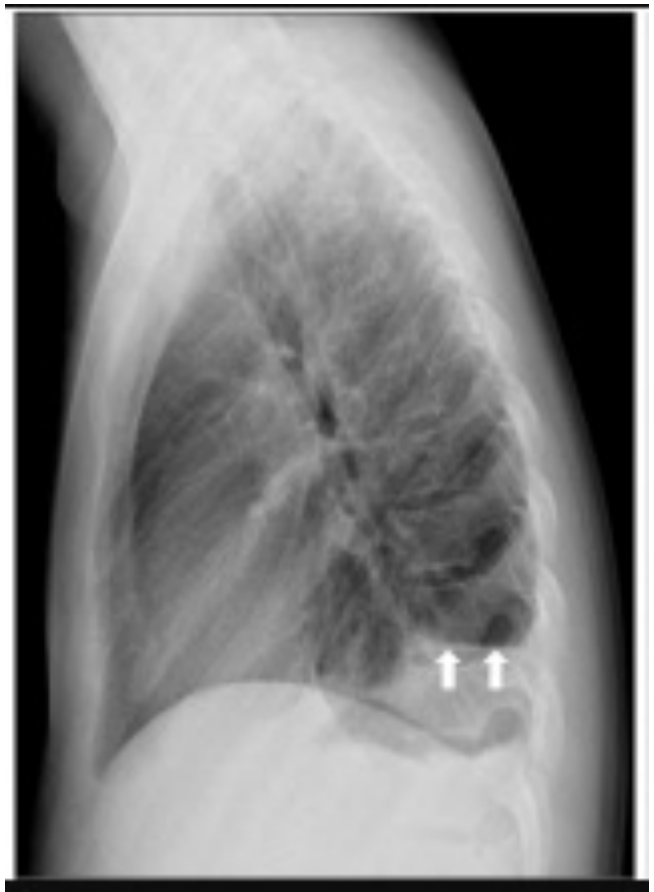
C – Wait 1 week after resolution of pntx on CXR

He can dive if further treatment is given

1. Your keen FY2 doctors on the ward was concerned about a patient which cough and they arranged a AP and lateral CXR, shown below. How much pleural fluid would you expect to be present given the below normal AP but abnormal lateral film?

1. 30mL
2. 50mL
3. 75mL
4. 100mL
5. 200mL





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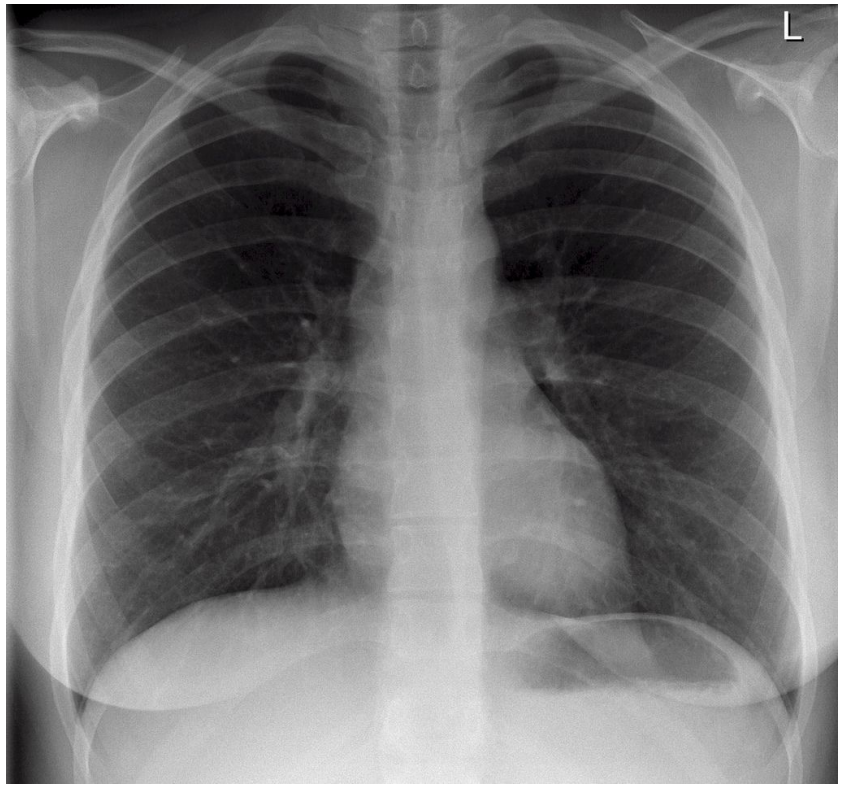

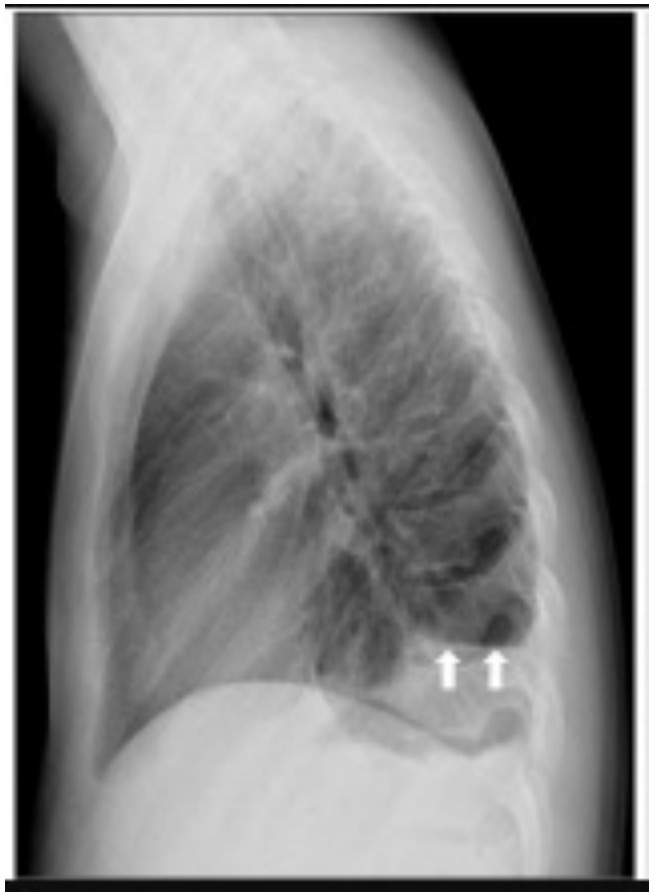

Q2 You’re given the results of a recent pleural tap you did on a 62 year women with SOB and a effusion. The lymphocytes are 70% of the nucleated cell. Which of the following causes does this exclude?

1. Benign asbestos
2. Chronic TB
3. Cardiac failure
4. Rheumatoid
5. Sarcoidosis

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2. Chronic TB
3. Cardiac failure
4. Rheumatoid
5. Sarcoidosis

- Any long-standing pleural effusion tends to become populated by lymphocytes.
- Pleural malignancy, cardiac failure and tuberculosis are common specific causes of lymphocyte-predominant effusions.

Box 4 Causes of pleural exudates

Common causes
- Malignancy
- Parapneumonic effusions
- Tuberculosis

Less common causes
- Pulmonary embolism
- Rheumatoid arthritis and other autoimmune pleuritis
- Benign asbestos effusion
- Pancreatitis
- Post-myocardial infarction
- Post-coronary artery bypass graft

Rare causes
- Yellow nail syndrome (and other lymphatic disorders eg, lymphangioleiomyomatosis)
- Drugs (see table 2)
- Fungal infections

Box 5 Causes of lymphocytic pleural effusions (ie, lymphocytes account for >50% of nucleated cells)

- Malignancy (including metastatic adenocarcinoma and mesothelioma)
- Tuberculosis
- Lymphoma
- Cardiac failure
- Post-coronary artery bypass graft
- Rheumatoid effusion
- Chylothorax
- Uraemic pleuritis
- Sarcoidosis
- Yellow nail syndrome

Predom effusion cell type	Lymphocytic Effusions >50%	Neutrophilic effusions	Eosinophilic effusions >10%
Why	Any long standing effusions tend to become populated by lymphocytes	This is an acute phase process.	Most commonly due to air or blood in pleural space. Non specific finding
Causes	Malignant TB Cardiac failure Lymphoma Chronic rheu Sarcoidosis Late CAGB	PE Para-pneumnic Acute TB Benign asbestos pleural effusions (this is an oddity – easy to examine on therefore)	Can occur in malignancy parapneumonic effusions, drug induced, benign asbestos, chrug-struass, lymphoma, pul infarction and parasitic disease

Q3. what tumour marker is relevant if detected in the context of pleural fluid analysis?

1. CEA,
2. CA-125,
3. Mesothelin
4. CA 15-3
5. CYFRA

Q3. what tumour marker is most relevant if detected in the context of pleural fluid analysis?

1. CEA,
2. CA-125,
3. Mesothelin
4. CA 15-3
5. CYFRA

Tumour markers - Mesothelium

- Pleural fluid tumour markers including CEA, CA-125, CA 15-3 and CYFRA has been shown to reach a combined sensitivity of only 54%, such that a negative result cannot be used to support a conservative approach to monitoring and investigation
- Mesothelin, however, has been shown to have more promising diagnostic characteristics
- Mesothelin is a glycoprotein tumour marker that is present at higher mean concentrations in the blood and pleural fluid of patients with malignant mesothelioma than in patients with other causes of pleural effusion
- Studies examining mesothelin levels in serum and/or pleural fluid have demonstrated a sensitivity of 48-84% and specificity of 70-100% for the diagnosis of mesothelioma
- It might be also used for its positive predictive value to clarify indeterminate cytology results
- It still warrants further study before its use can be routinely recommended however

Which of the below is not a characteristic sign of malignant pleural disease

1. nodular pleural thickening,
2. mediastinal pleural thickening,
3. parietal pleural thickening >1cm
4. circumferential pleural thickening.
5. pleura enhances intensely around the fluid which usually forms a lenticular opacity

Which of the below is not a characteristic sign of malignant pleural disease

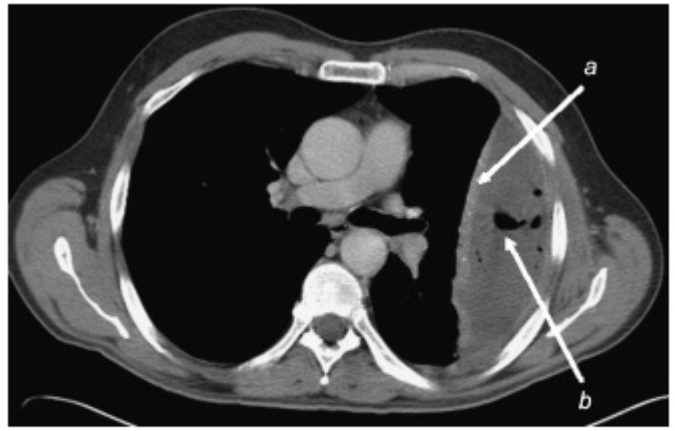


Figure 4 CT scan of left empyema with pleural enhancement (a) and suspended air bubbles (b).

Thorax 2010;**65**(Suppl 2):ii4–ii17. doi:10.1136/thx.2010.136978

1. nodular pleural thickening,
2. mediastinal pleural thickening,
3. parietal pleural thickening >1cm
4. circumferential pleural thickening.
5. pleura enhances intensely around the fluid which usually forms a lenticular opacity

This occurs in empyema as well as suspended air bubbles which imply septations

Surgery for pleural disease—effusions

- **A 74 year old retired builder presents with left sided chest pain, breathlessness and weight loss. His PET-CT is shown below. Pleural fluid protein is 42, cytology and percutaneous pleural biopsy are negative for malignancy. What is the most appropriate next step?**

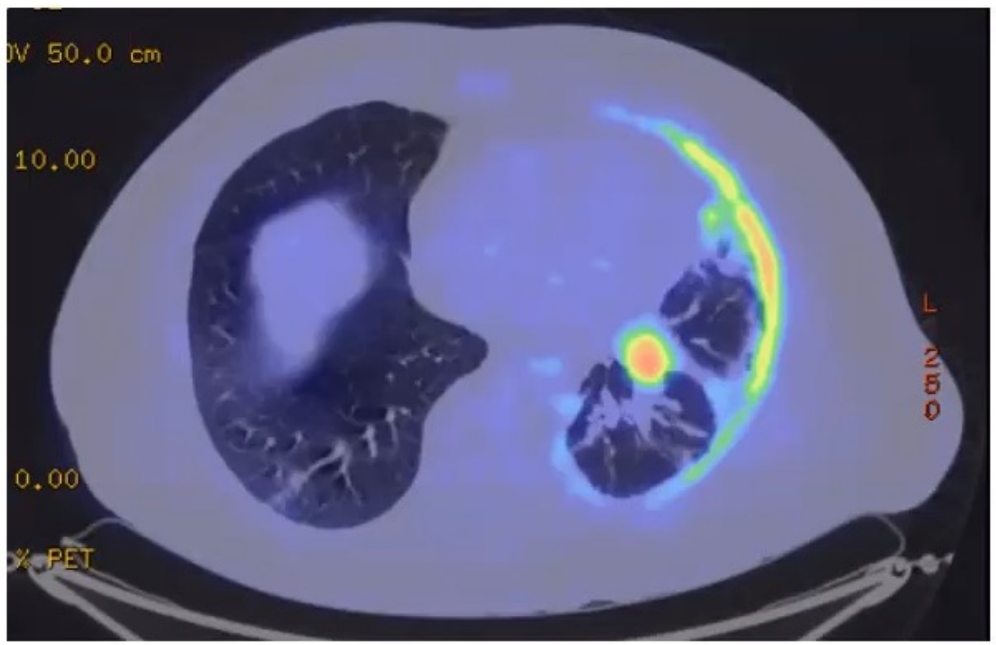
  A. Medical thoracoscopy

  B. Follow up CT

  C. VATS biopsies

  D. Repeat percutaneous biopsies

  E. Pleurodesis



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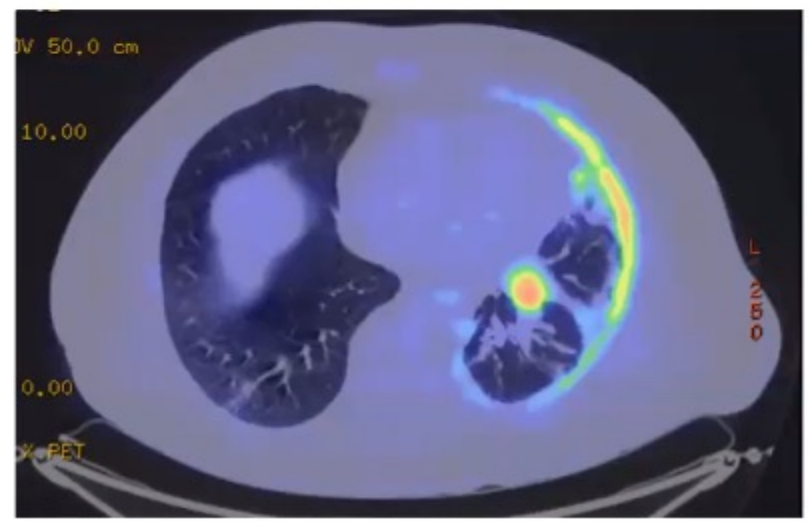
  B. Follow up CT
  C. VATS biopsies
  D. Repeat percutaneous biopsies
  E. Pleurodesis

  C

Not enough fluid on the CT for this



What is the minimal volume of pleural fluid detectable on thoracic ultrasound?

a) 5mls
b) 20mls
c) 50mls
d) 100mls
e) 200mls

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a) 5mls
b) 20mls
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d) 100mls
e) 200mls

5mLs

Which of the following features are suggestive of pleural malignancy on thoracic CT scan?

a) Pleural thickening >1cm, mediastinal pleural involvement, visceral thickening
b) Pleural thickening >1cm, mediastinal pleural involvement, circumferential thickening
c) Visceral pleural thickening, pleural nodularity, rib crowding
d) Pleural effusion, parenchymal banding, rounded atelectasis
e) Pleural effusion, mediastinal lymph nodes, interlobular septal thickening

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c) Visceral pleural thickening, pleural nodularity, rib crowding
d) Pleural effusion, parenchymal banding, rounded atelectasis Benign
e) Pleural effusion, mediastinal lymph nodes, interlobular septal thickening HF

Ans - B 3 of the 4 Leung criteria →

Presence of Leung's criteria
Circumferential pleural thickening
Nodularity
Thickness >1cm
Mediastinal pleural involvement

ORTU

Question 8

A 50-year-old lady is admitted to hospital with breathlessness. A chest Xray is performed showing a right sided effusion. USS chest reveals an echogenic effusion. A diagnostic aspirate is performed which shows

- milky fluid
- pH 7.2, pleural fluid glucose 1.5, serum glucose 4.6
- pleural protein 40, serum protein 75
- Cholesterol levels 6.2mmol/L.

What is the likely cause of the effusion?

a) Empyema
b) Parapneumonic effusion
c) RA
d) PE
e) Heart failure

ORTU

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What is the likely cause of the effusion?

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b) Parapneumonic effusion
c) RA
d) PE
e) Heart failure

Question 9

Which of the following features are **not** suggestive of chylothorax?

a) TG>1.24mmol/L
b) Cholesterol level >5.18 mmol/L
c) Presence chylomicrons
d) Absent cholesterol crystals
e) Milky fluid

ORTU

Question 9

Which of the following features are **not** suggestive of chylothorax?

a) TG>1.24mmol/L
b) Cholesterol level >5.18 mmol/L
c) Presence chylomicrons
d) Absent cholesterol crystals
e) Milky fluid

B – cholesterol level

What is the cytology sensitivity of pleural fluid for a diagnosis of mesothelioma?

a) 10%
b) 20%
c) 30%
d) 40%
e) 50%
f) 60%

What is the cytology sensitivity of pleural fluid for a diagnosis of mesothelioma?

a) 10%
b) 20%
c) 30%
d) 40%
e) 50%
f) 60%

10%

What is the cytology sensitivity of pleural fluid for a diagnosis of breast cancer?

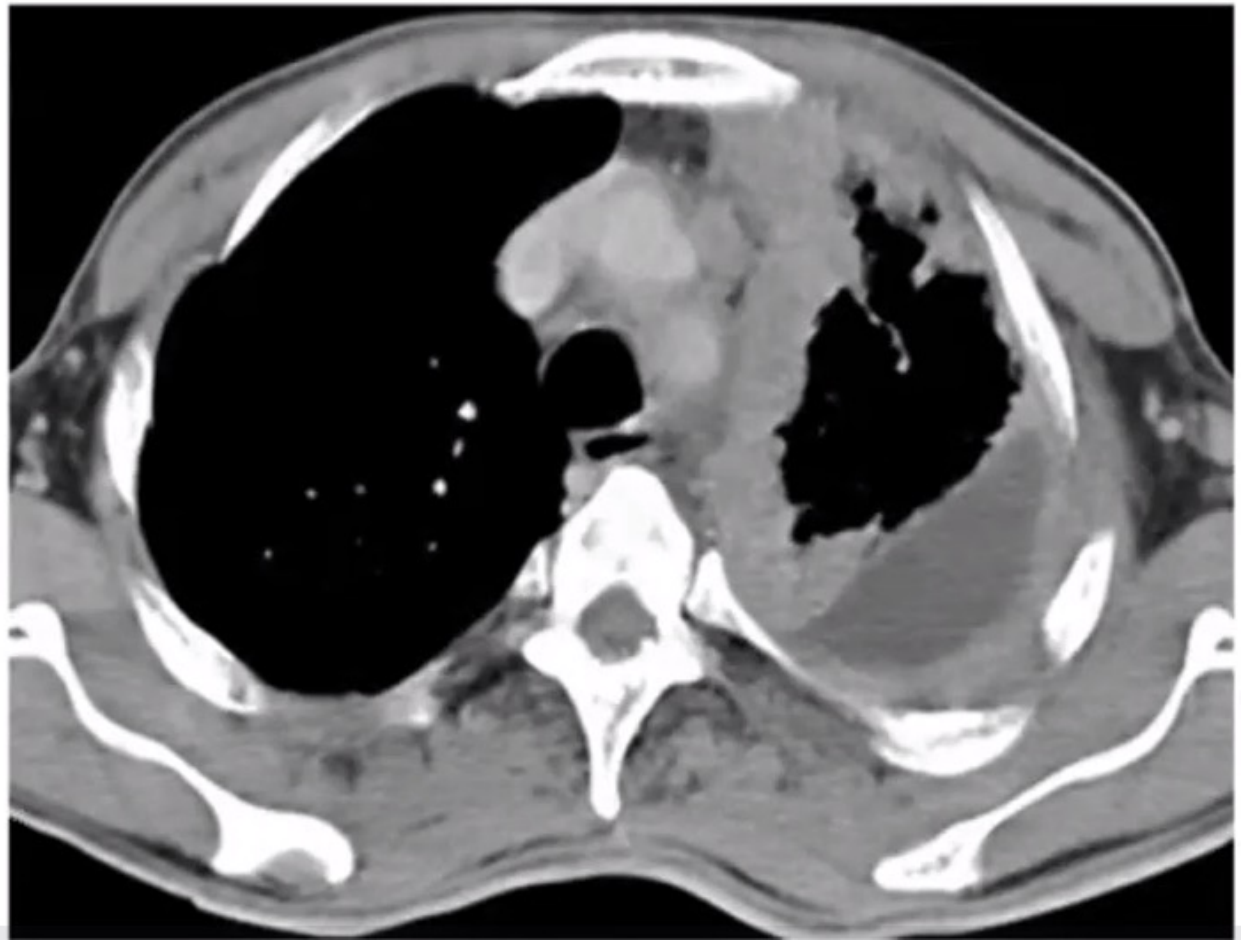
a) 10%
b) 20%
c) 30%
d) 40%
e) 50%
f) 60%

What is the cytology sensitivity of pleural fluid for a diagnosis of breast cancer?

a) 10%
b) 20%
c) 30%
d) 40%
e) 50%
f) 60%

Ans - 60%

- 70-year-old man, presented with chest pain and weight loss. He had a previous history of tuberculosis in his 20s, which with treated with 6 months anti-TB drugs. He is a current smoker, with a 20-pack year history. He is a retired carpenter.



- A pleural biopsy is performed and IHC shows positive cytokeratin 5/6 and positive calretinin, with negative TTF1 and CEA. Micro is negative for AFB, culture pending. What is the likely cause of his symptoms?

a) Mesothelioma
b) Asbestos-related plaques
c) Adenocarcinoma
d) Pleural TB
e) Pleural infection

- What treatment has been shown to prolong survival in this condition?

a) Pleurectomy-decortication
b) Pemetrexed + Cisplatin chemotherapy
c) Pembrolizumab
d) Extrapleural pneumonectomy (EPP)
e) EPP + chemotherapy + radiotherapy

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c) Pembrolizumab
d) Extrapleural pneumonectomy (EPP)
e) EPP + chemotherapy + radiotherapy

b) Pem + Cis is the only life prolonging treatment in meso

- **Which of the following is true?**

a) IPCs are more effective in controlling breathlessness than talc pleurodesis
b) Talc poudrage is more effective than slurry
c) IPCs are associated with lower complications than talc
d) IPCs result in less time in hospital than talc slurry pleurodesis
e) IPC treatment result in pleurodesis in 60% of cases
f) NSAIDs reduce pleurodesis success

- **Which of the following is true?**

a) IPCs are more effective in controlling breathlessness than talc pleurodesis NO – same

b) Talc poudrage is more effective than slurry NO

c) IPCs are associated with lower complications than talc

d) IPCs result in less time in hospital than talc slurry pleurodesis YES

e) IPC treatment result in pleurodesis in 60% of cases NO

f) NSAIDs reduce pleurodesis success NO – on oxford they use 800mg Ibuprofen 3 x day for 3 days

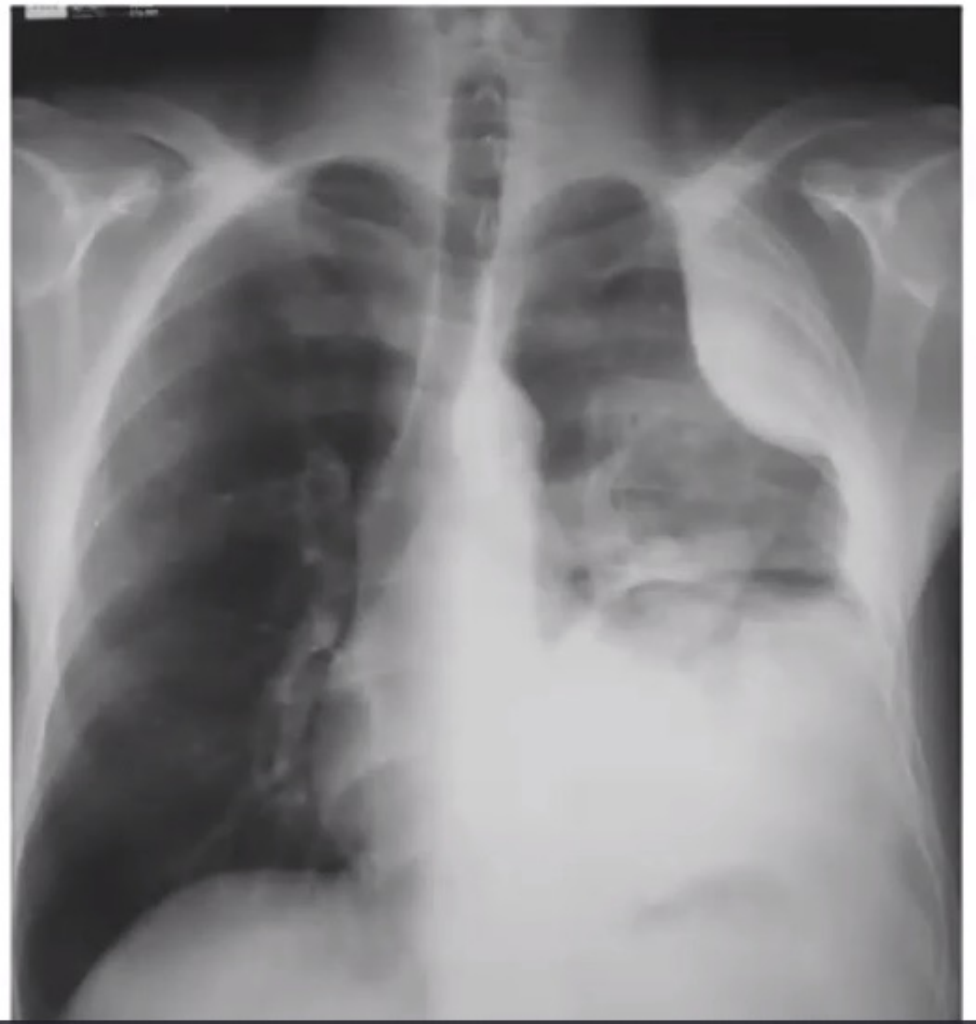
D

IPC versus talc slurry/ICD

Comparison (IPC versus Talc)	Comparator	Statistical Significance
Hospital stay (days)	**-3.5 days**	**p<0.001** 95% CI -4.8 to -1.5
Days in hospital over 12 months	**-3.5 days**	**p<0.001**
Requirement for further pleural procedures	**OR 0.21**	**p=0.03** 95% CI 0.04 to 0.86
Adverse Events	**OR 4.70**	**p=0.002** 95% CI 1.75 to 12.60

- A 50-year-old smoker presents to ED with the CXR below. He is complaining of general malaise, fever and cough. He has had no recent contact with health care professionals. He is usually fit and well. What is the likely cause of his infection?

a) Streptococcus pneumoniae
b) Streptococcus milleri
c) Enterobacteriaceae
d) Pseudomonas
e) Staphylococcus species



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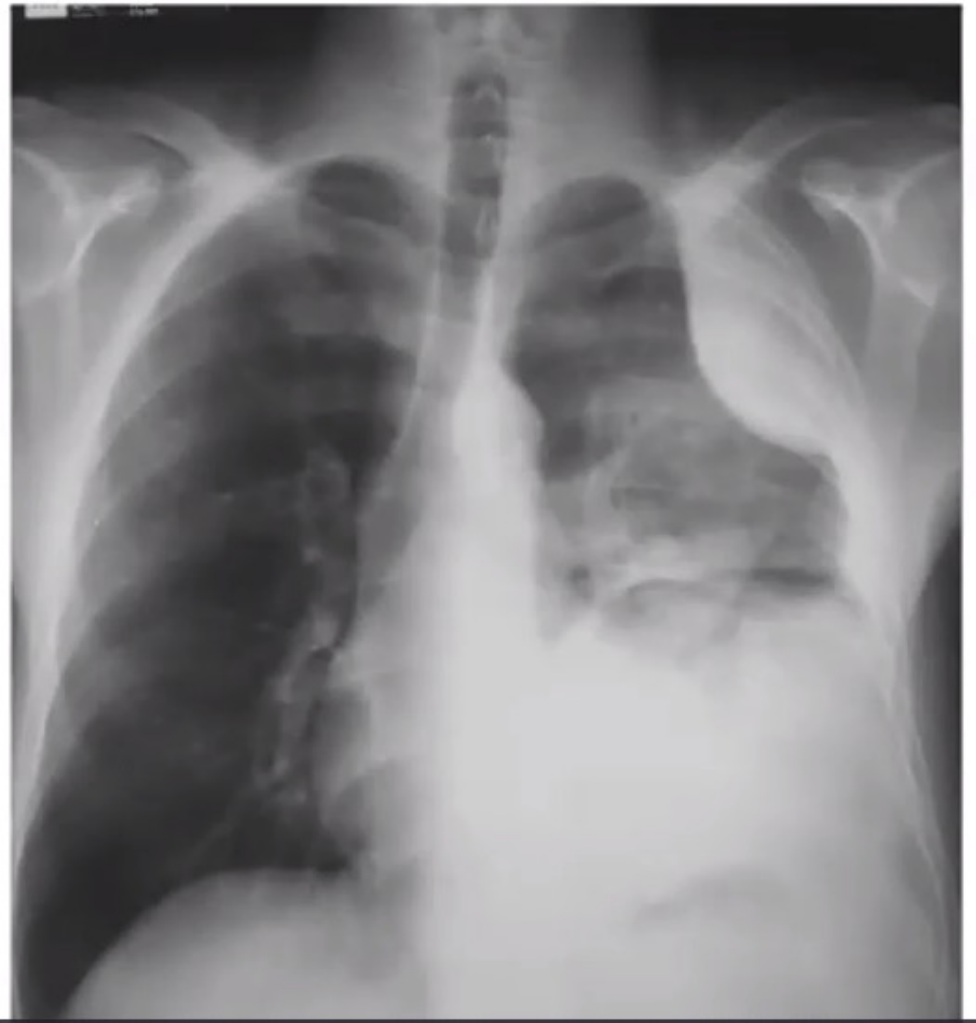

B

- **What is the most appropriate antibiotic choice?**

a) IV Cefuroxime
b) IV gentamicin
c) IV benzylpenicillin and clarithromycin
d) IV Meropenem + metronidazole
e) IV Co-amoxiclav + metronidazole

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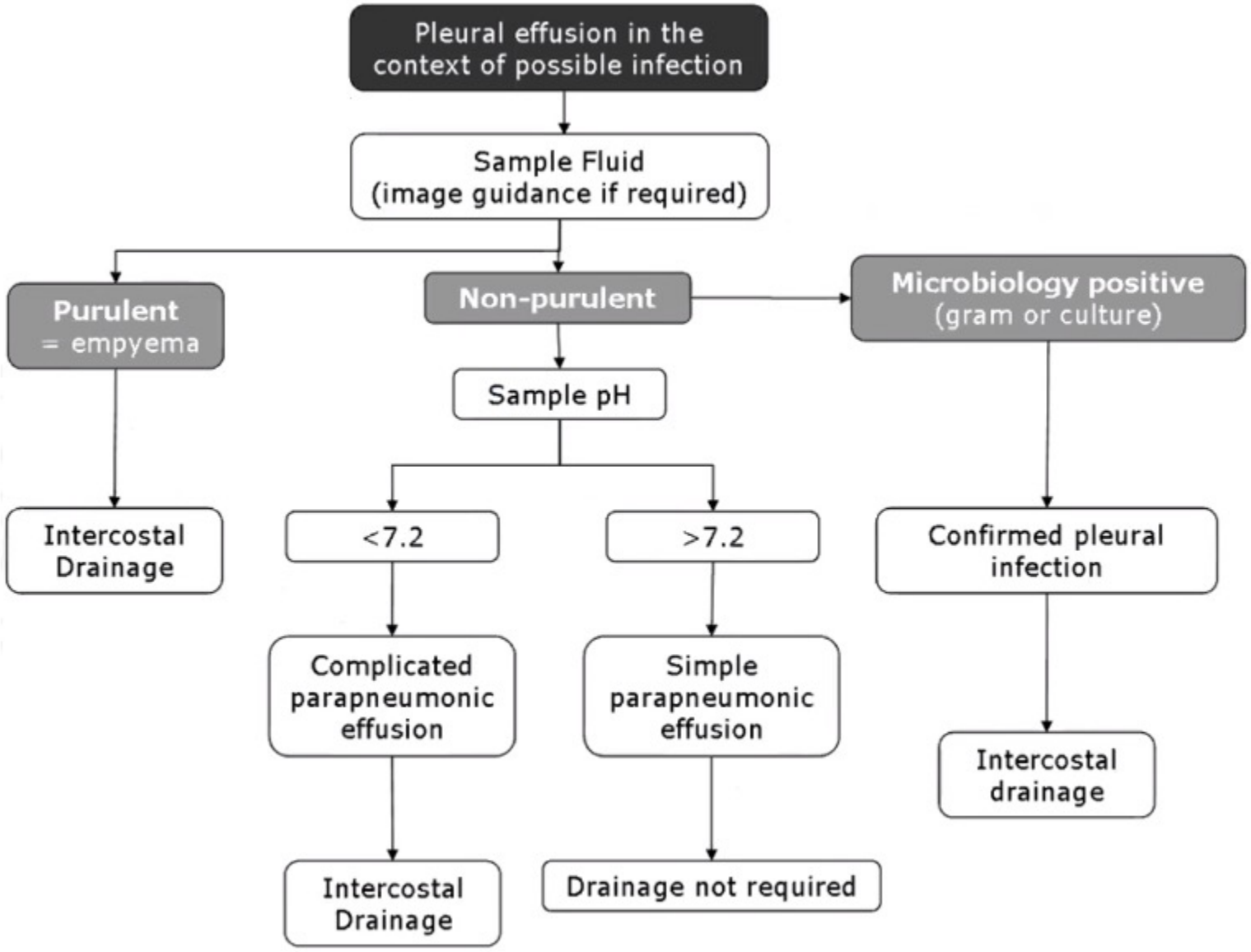
E

BTS


Pleural effusion in the context of possible infection
Sample Fluid (image guidance if required)
Purulent = empyema
Non-purulent
Microbiology positive (gram or culture)
Sample pH
Intercostal Drainage
<7.2
>7.2
Confirmed pleural infection
Complicated parapneumonic effusion
Simple parapneumonic effusion
Intercostal drainage
Intercostal Drainage
Drainage not required

- A 45 year old fit and well man is admitted with a loculated right effusion.
- Pleural pH 6.9, LDH 1400, glucose <1.0 and raised inflammatory markers.
- Intercostal drainage is conducted and iv co-amoxiclav and metronidazole started.
- 48 hours after admission, he remains septic with a substantial pleural collection. Cultures are negative

Which of the following treatments is rational?

a) Switch to IV meropenem
b) VATs surgery
c) Add IV gentamicin
d) Intrapleural tPA
e) Intrapleural streptokinase

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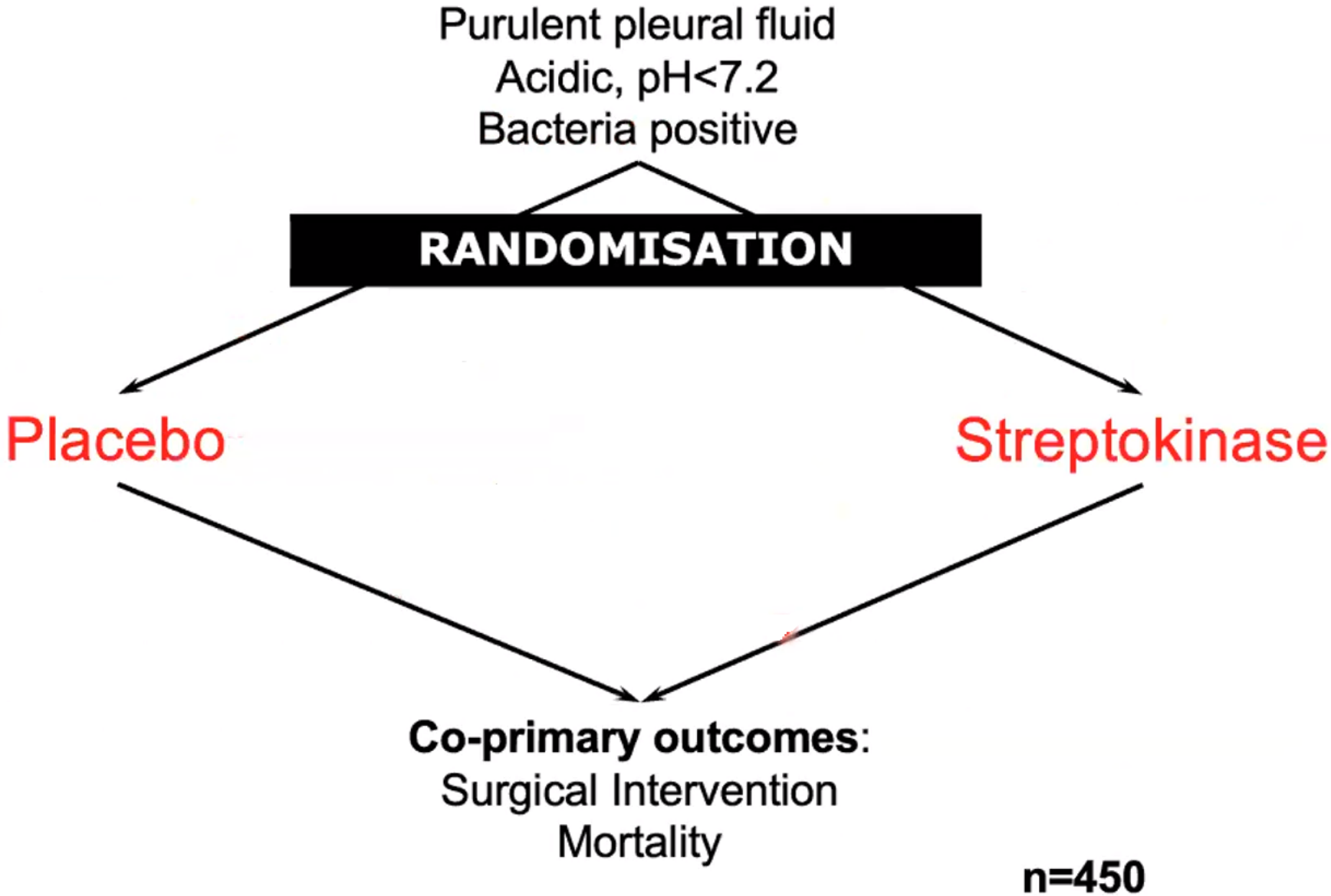
B

MIST1



Maskell et al NEJM; 352: 865-874

Outcome of MIST1 - Streptokinase doesn't work which ever way u cut it

MIST2

NEJM; 365: 518-526

Purulent pleural fluid
Acidic, pH<7.2
Bacteria positive

DNase | TPA | DNase & TPA | Placebo

Radiograph outcome
Surgical Rate / Mortality

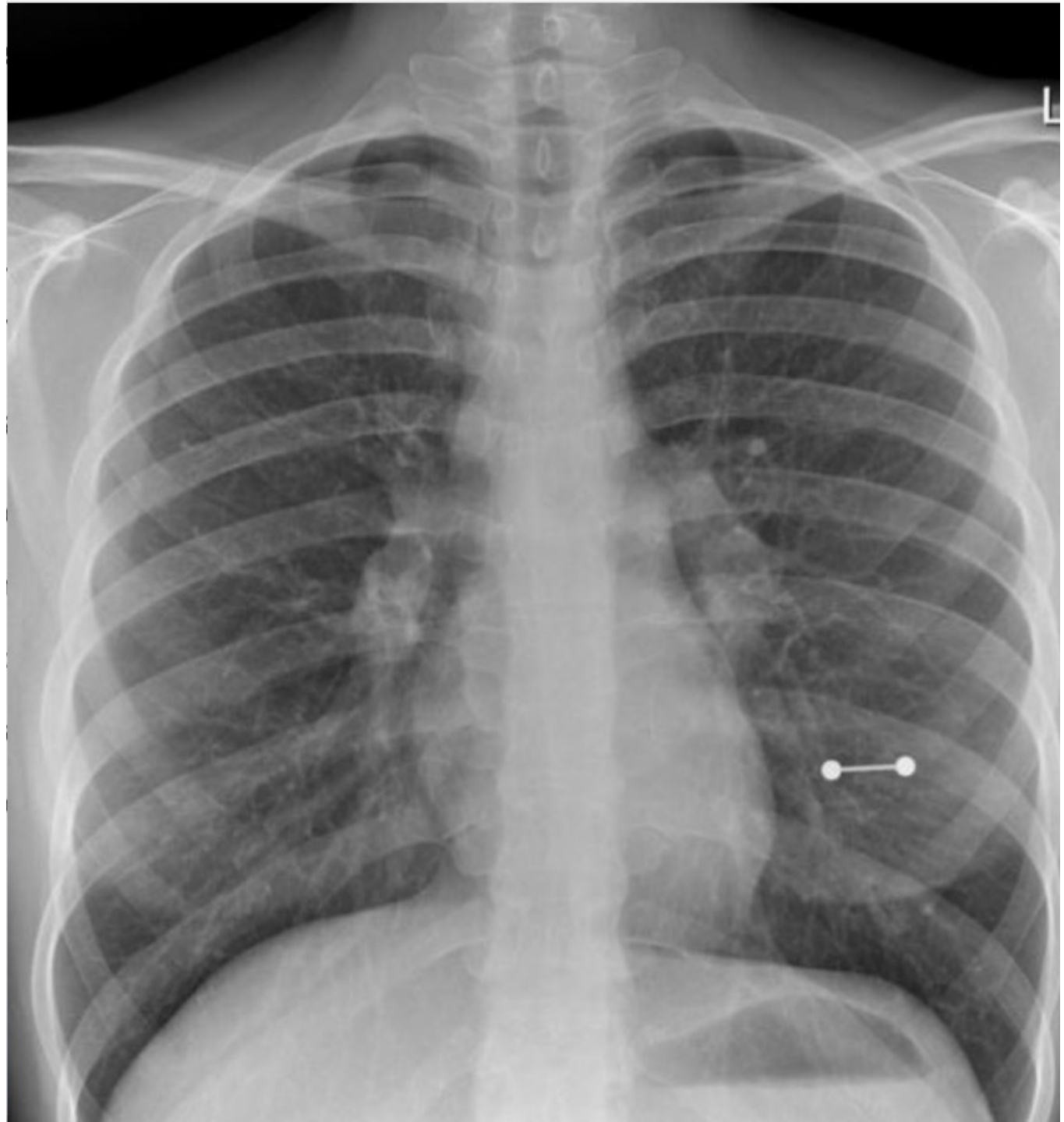
Reduce surgical referral by 80% and reduce hospital stay

Radiology for SCE

32 year old fit and well woman with no significant past medical history underwent a CXR as part of a medical assessment for a visa application.

The CXR findings are most in keeping with:

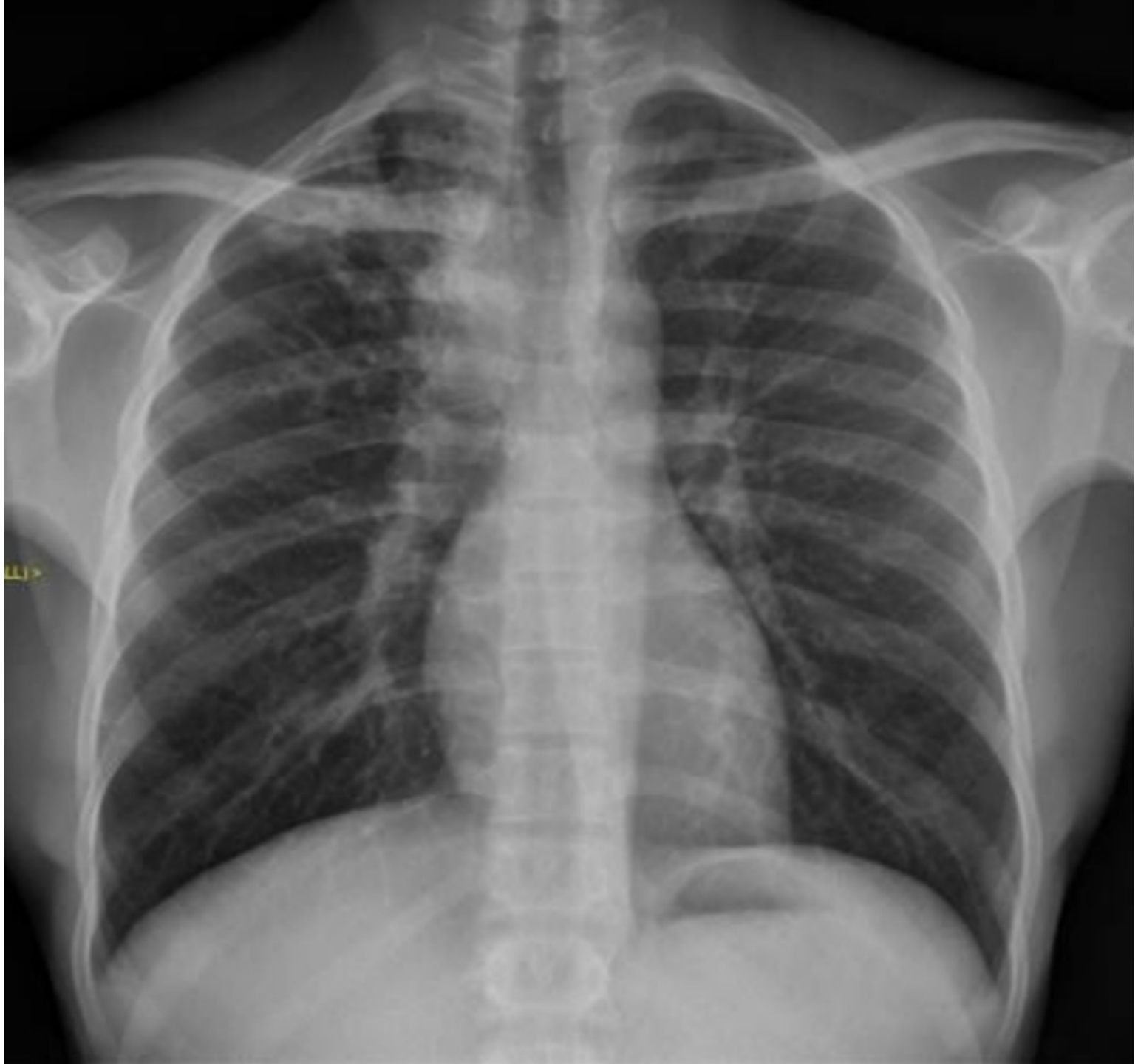
- A. Atrial septal defect
- B. Lymphoma
- C. Normal study
- D. Sarcoidosis
- E. Tuberculosis



A 48 year old man presented with a 4 month history of cough, weight loss and minor haemoptysis.

What is the most likely diagnosis?

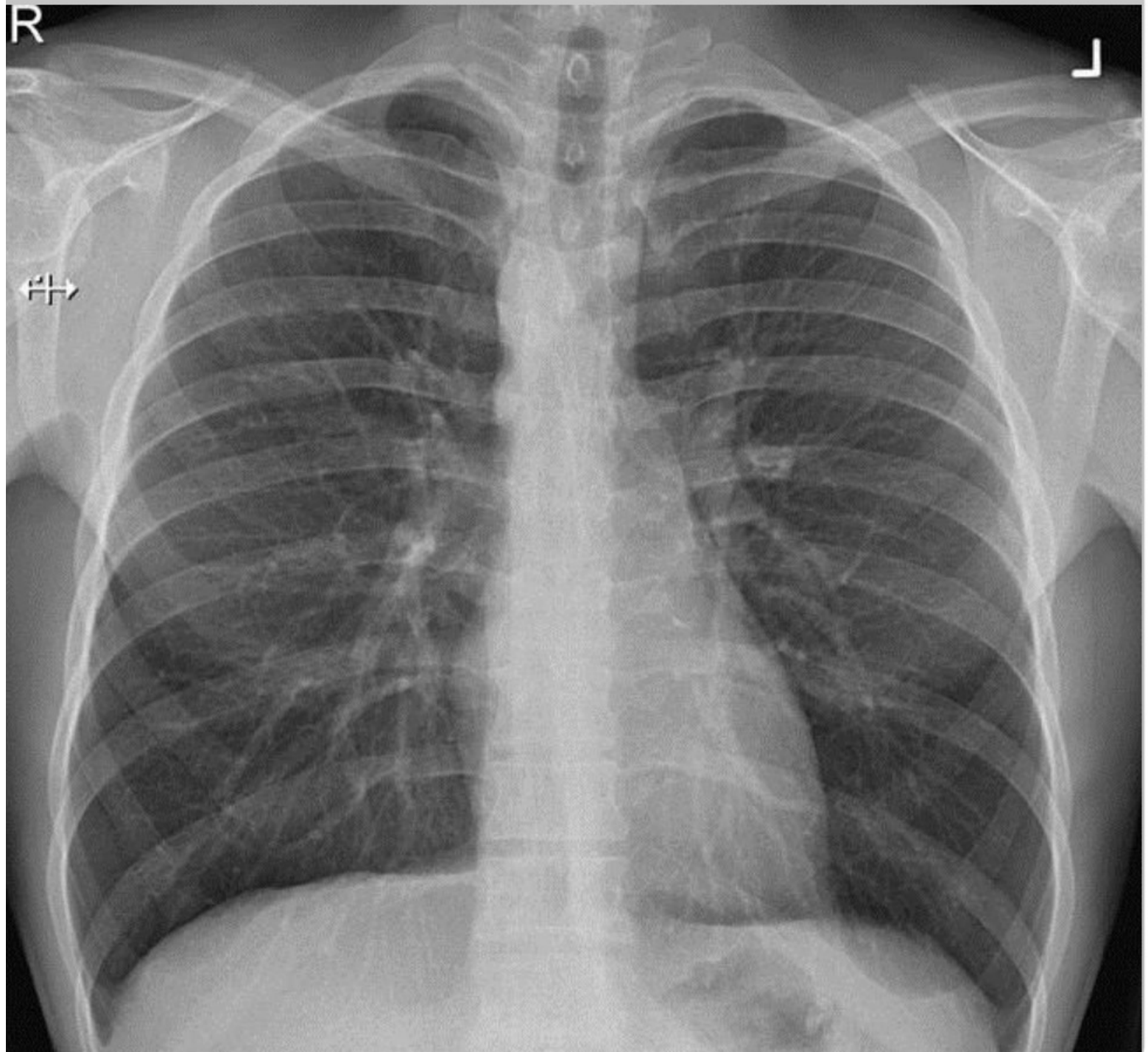
- A. bronchogenic carcinoma
- B. bronchogenic cyst
- C. Lymphoma
- D. Thymoma
- E. Tuberculosis



A 19 year old man presented from Ophthalmology with anterior uveitis.
Examination: normal

What is the most likely cause of CXR appearance?

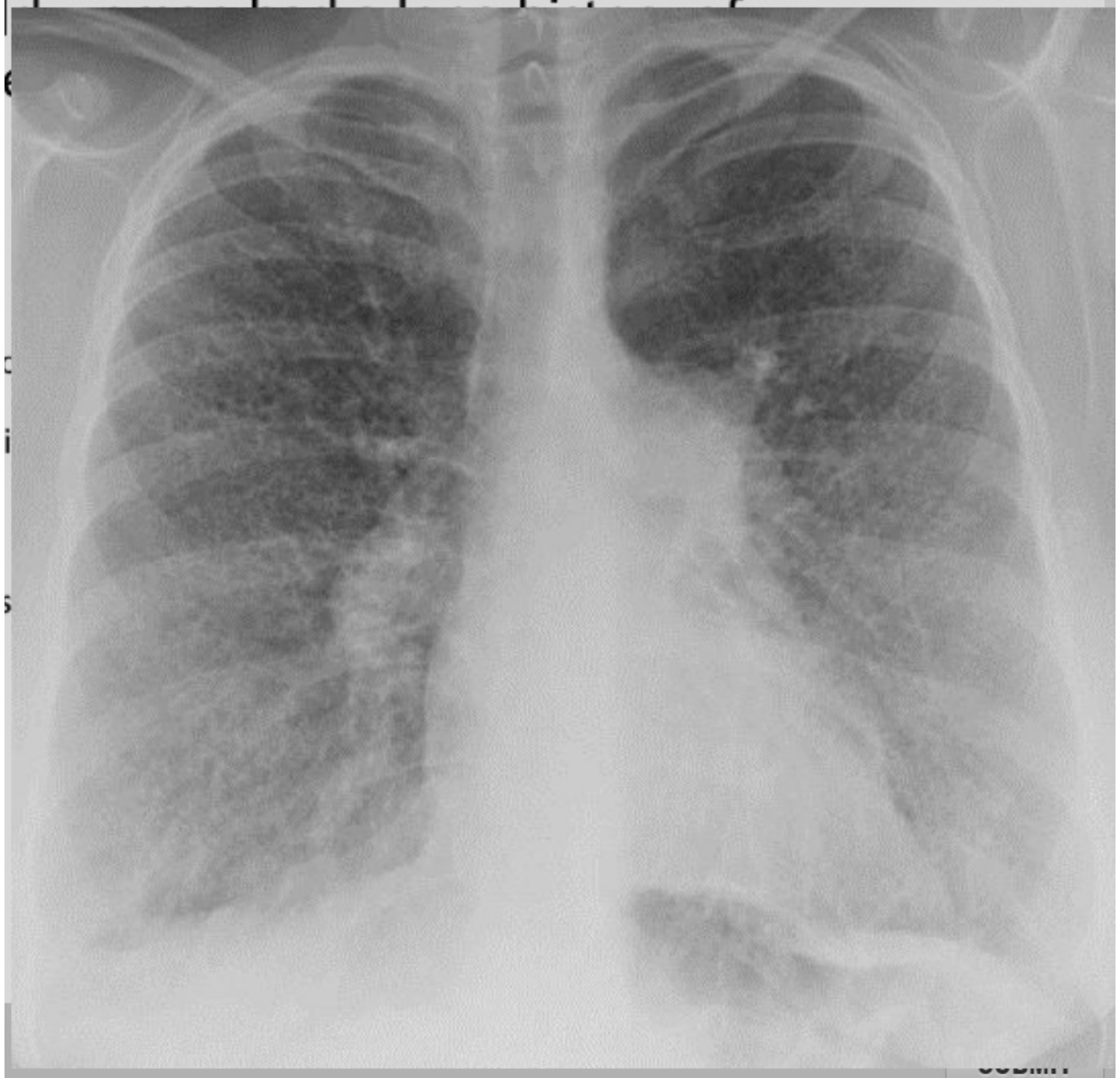
- A. bronchogenic cyst
- B. lymphoma
- C. normal variant
- D. sarcoidosis
- E. TB adenopathy


R

A 35 year old woman had a long history of breathlessness, increasing recently.

What is the most likely diagnosis?

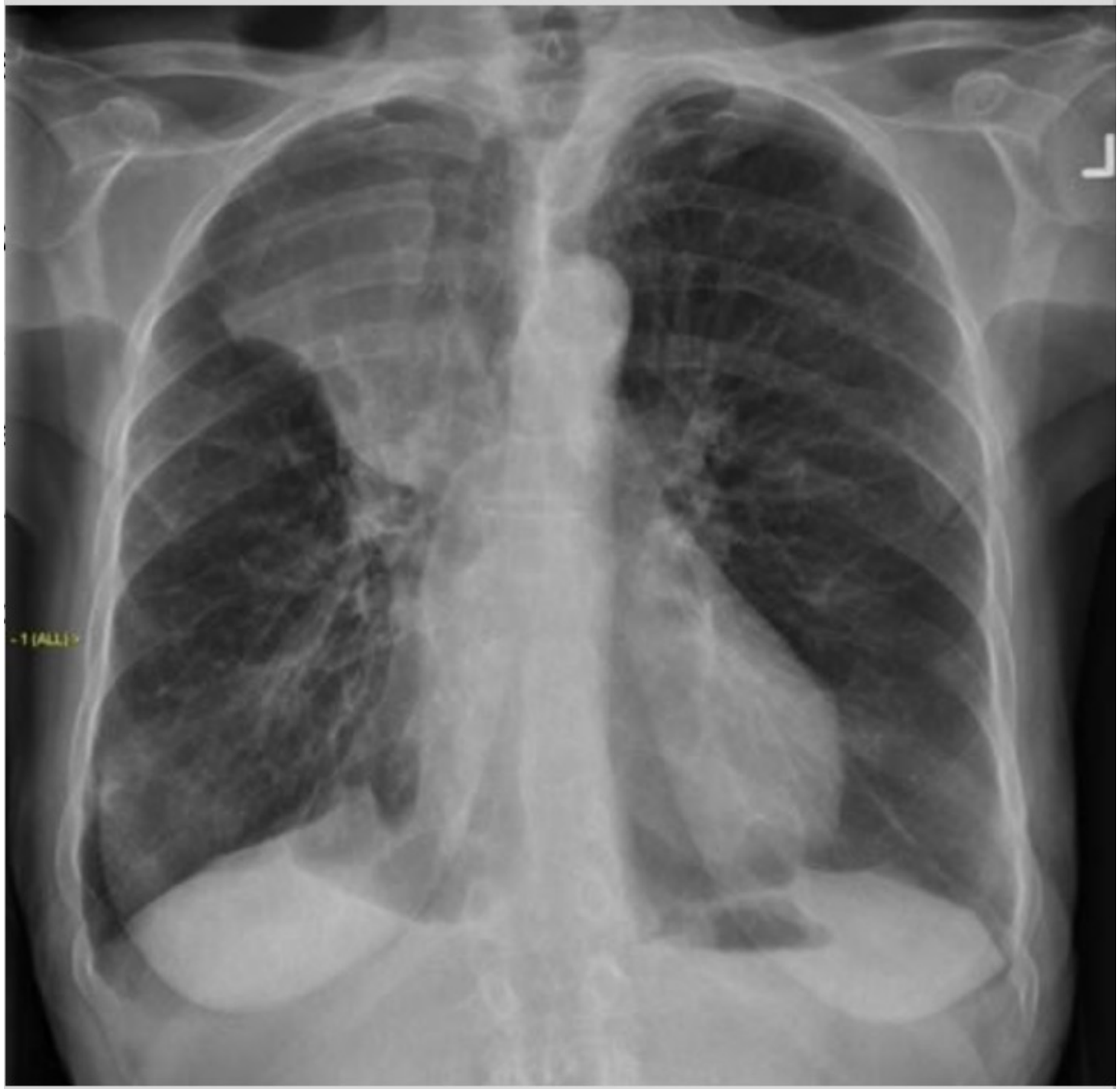
- A. chronic thromboembolic disease
- B. hypersensitivity pneumonitis
- C. LAM
- D. metastatic sarcoma
- E. sarcoidosis



A 75 year old woman presented with a 6 weeks history of cough and malaise.

What is the most likely diagnosis?

- A. bronchogenic carcinoma
- B. community acquired pneumonia
- C. loculated pleural effusion
- D. metastatic breast cancer
- E. rib metastasis



A 64 year old man presented with a history of increasing cough and a similar episode the previous winter.
On examination: basal crackles

What is the most likely diagnosis?

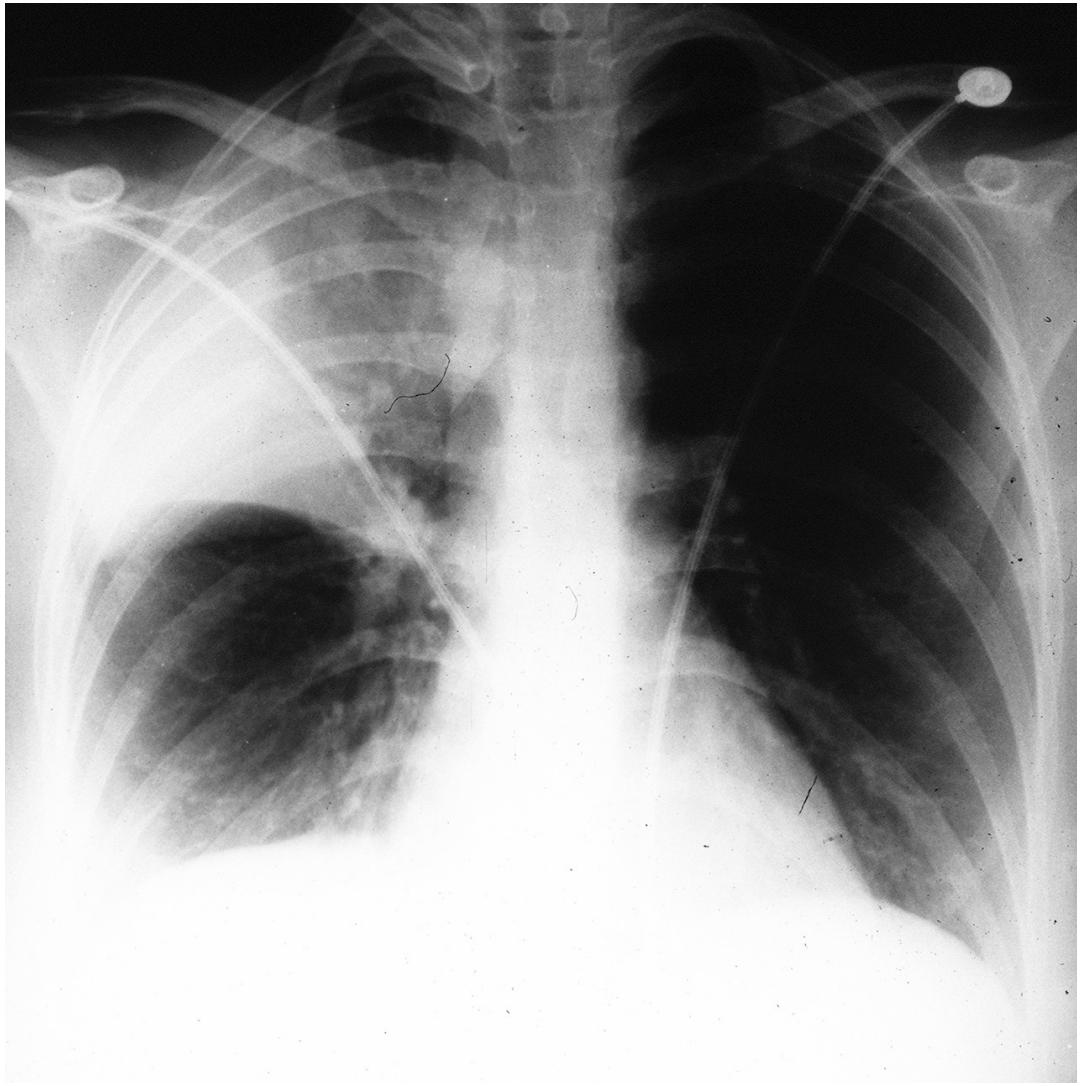
- A. adenocarcinoma with lepidic growth
- B. aspiration pneumonitis
- C. bronchiectasis
- D. Hypersensitivity pneumonitis
- E. idiopathic pulmonary fibrosis

Case 1

- 20 yr old student
- 24h fever, malaise
- Cough
- otherwise well

O/E

- Temp 38.5^0 C
- Pulse 112
- BP 126/60, RR 30,
- Urea 7.0, Cr 62, Na 130, K 5.4

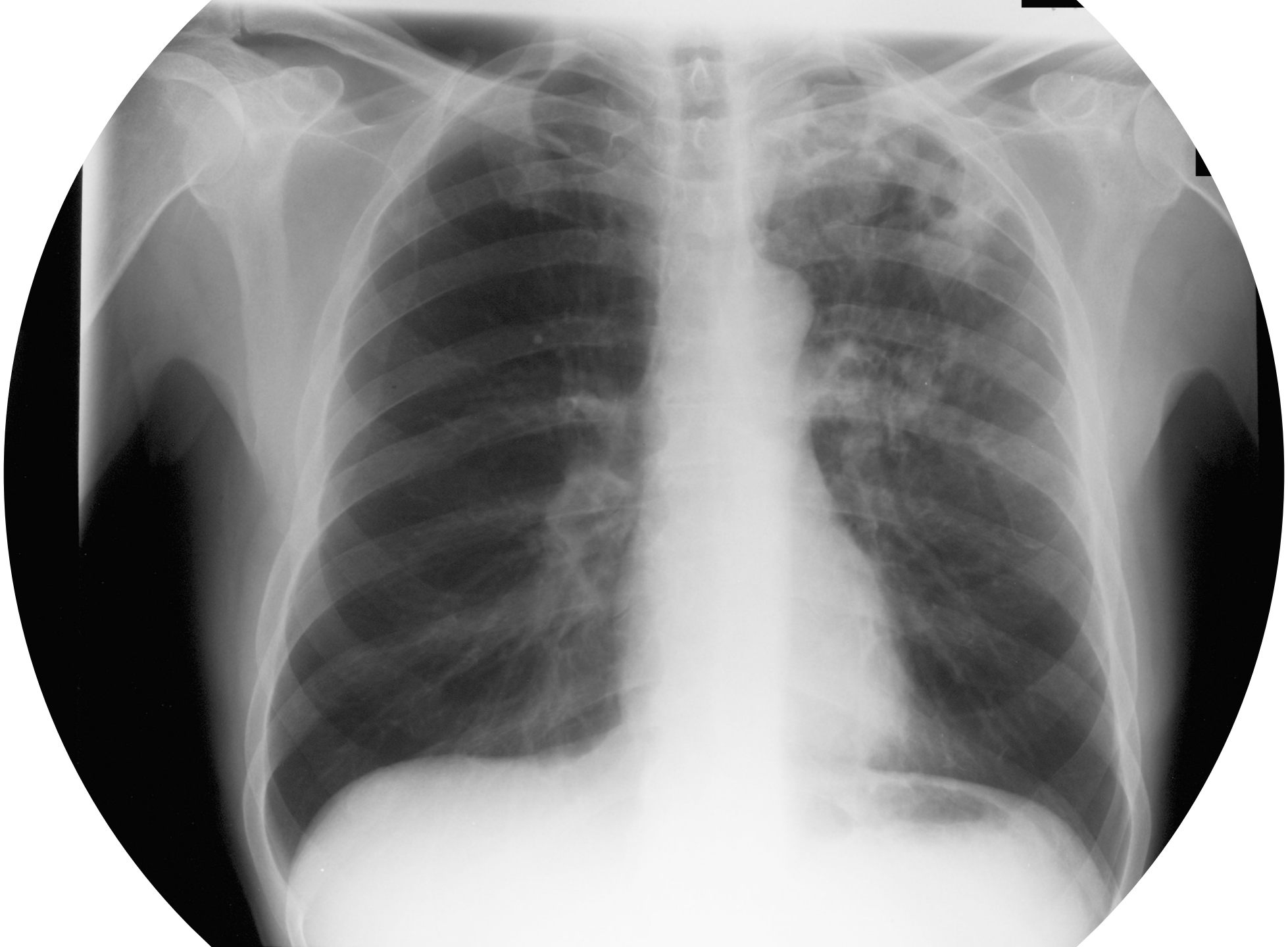


What is the CURB-65?

- 2

CURB-65	Clinical Feature	Points
C	Confusion	1
U	Urea > 7 mmol/L	1
R	RR ≥ 30	1
B	SBP ≤ 90 mm Hg OR DBP ≤ 60 mm Hg	1
65	Age > 65	1

CURB-65 Score	Risk group	30-day mortality	Management
0 -1	1	1.5%	Low risk, consider home treatment
2	2	9.2%	Probably admission vs close outpatient management
3-5	3	22%	Admission, manage as severe



Case

- 56y old Bangladeshi man
- 6/12 wt loss
- 3/52 haemoptysis - clots of bright red blood

What initial test would you do?

1. Induced sputum AFB micro and culture
2. CTPA
3. Spontaneously produced deep sputum AFB micro and culture
4. CT thorax

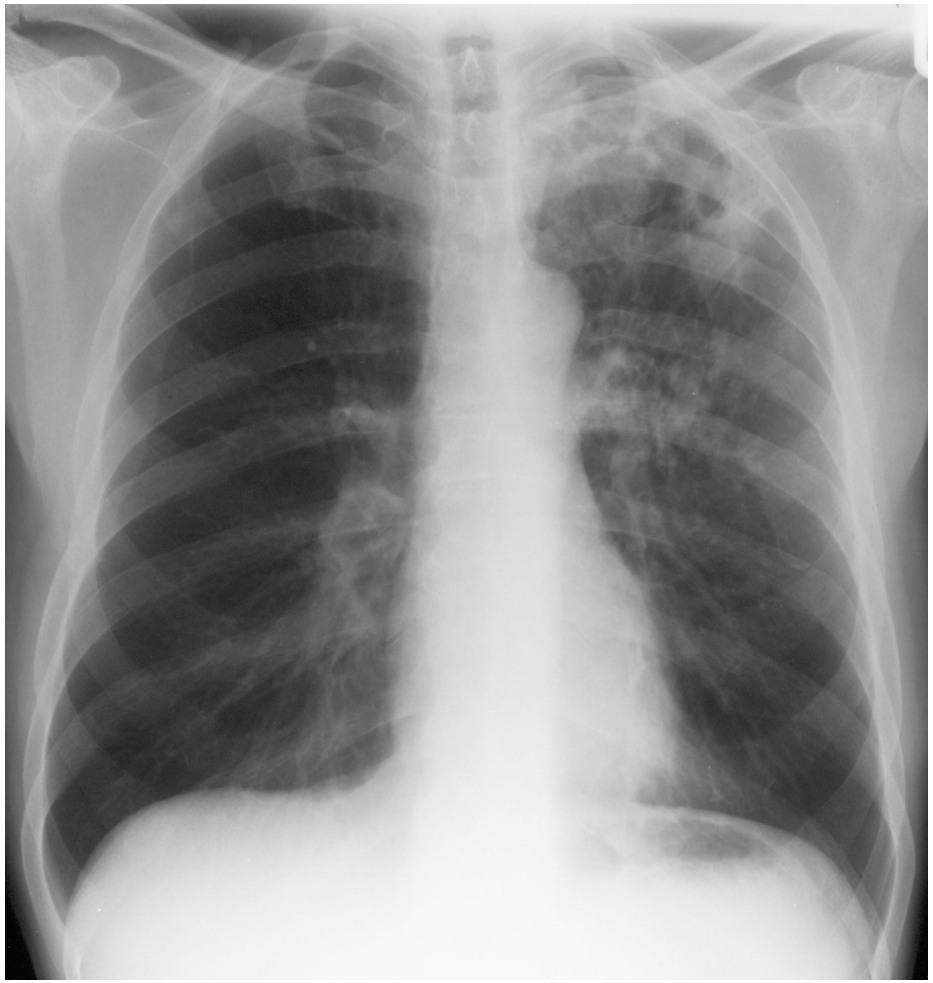
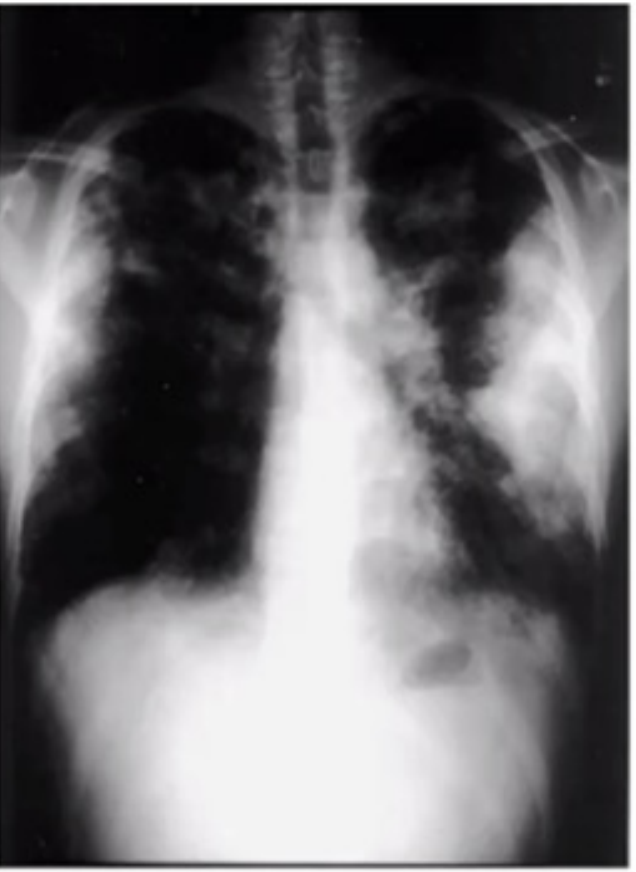
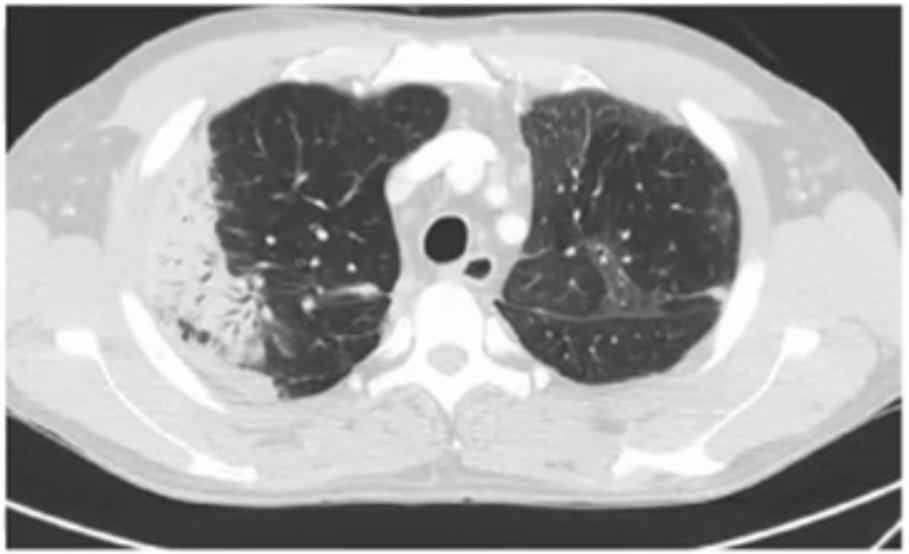


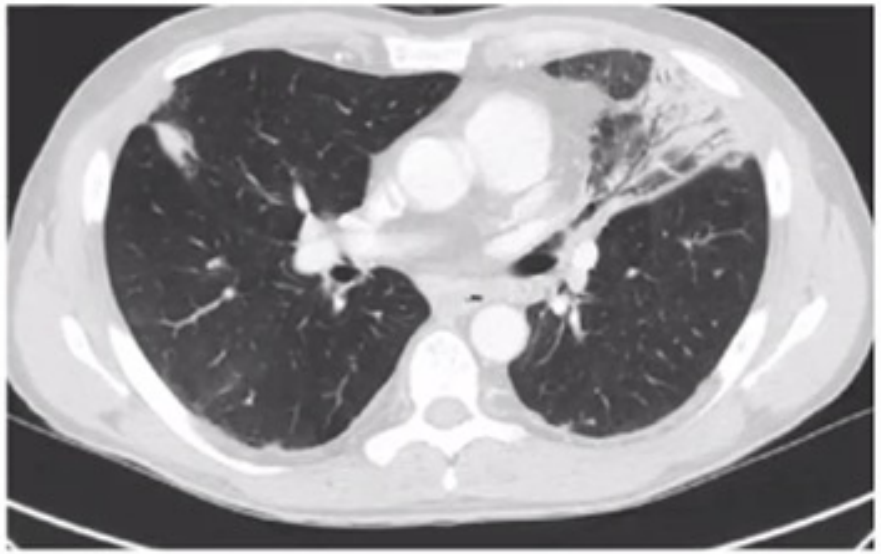
Table 1 Diagnostic investigations for pulmonary TB

Suspected site of disease	Possible imaging techniques [a]	Specimen	Routine test	Additional tests (if it would alter management)
Pulmonary (adult)	X-ray[b] CT thorax	3 respiratory samples: • preferably spontaneously-produced, deep cough sputum samples, otherwise induced sputum or bronchoscopy and lavage • preferably 1 early morning sample	Microscopy Culture Histology	Nucleic acid amplification test

- 64y old female
- asthma
- 6/52 of cough and wheeze
- Blood Hb 156, Neutro 7.4, platelets 364, eosinophils 0.78, lymphocytes 0.43, Total IgE 452, indeterminate IgG aspergillus, IgE Asp +ve







What's the most likely diagnosis?

1. Idiopathic acute eosinophilic pneumonia
2. ABPA
3. Idiopathic chronic eosinophilic pneumonia CEP
4. Asthma with fungal sensitivities
5. Bronchiectasis

Distinctive features of idiopathic chronic eosinophilic pneumonia (ICEP) and idiopathic acute eosinophilic pneumonia (IAEP)

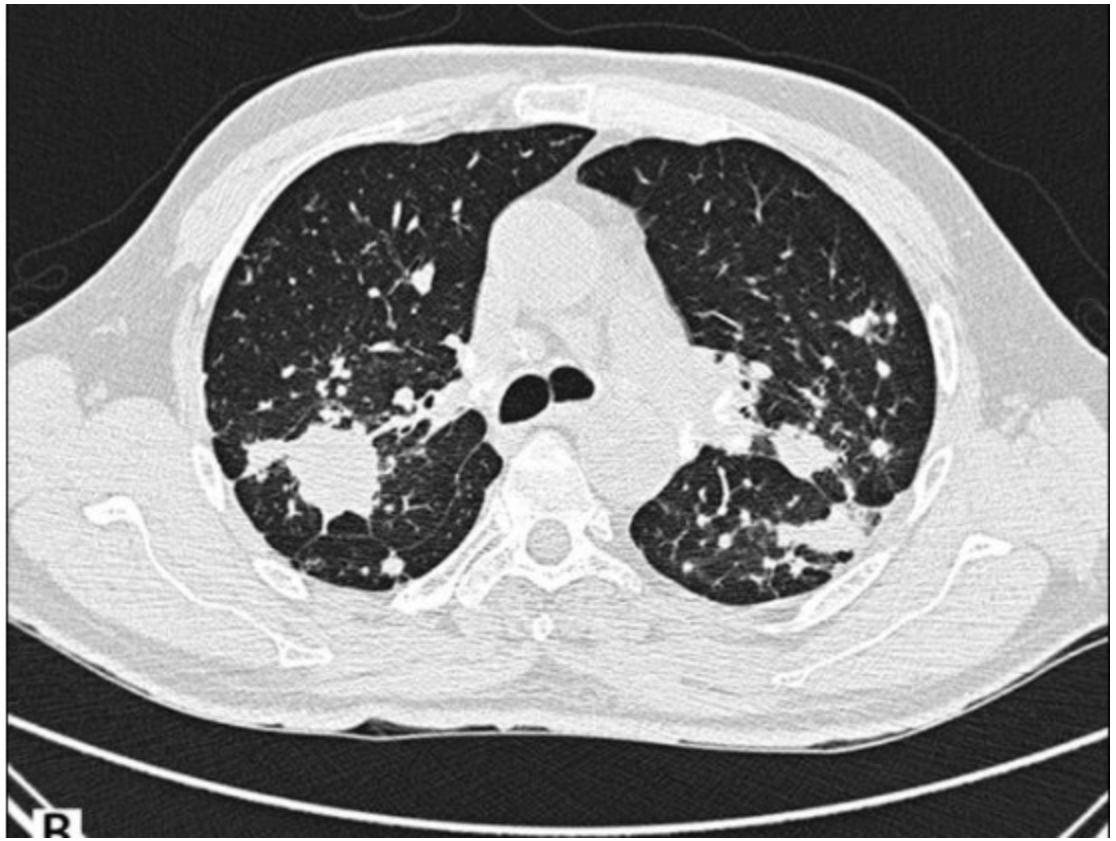
Characteristic	ICEP	IAEP
Onset	>2–4 wk	<1 mo
History of asthma	Yes	No
Smoking history	10% of smokers	2/3 smokers, often recent initiation
Respiratory failure	Rare	Usual
Initial blood eosinophilia	Yes	Often No (typically delayed)
Bronchoalveolar lavage eosinophilia	>25%	>25%
Chest imaging	Homogeneous peripheral airspace consolidation	Bilateral patchy areas of ground-glass attenuation, airspace consolidation, interlobular septal thickening, bilateral pleural effusion
Relapse	Yes	No

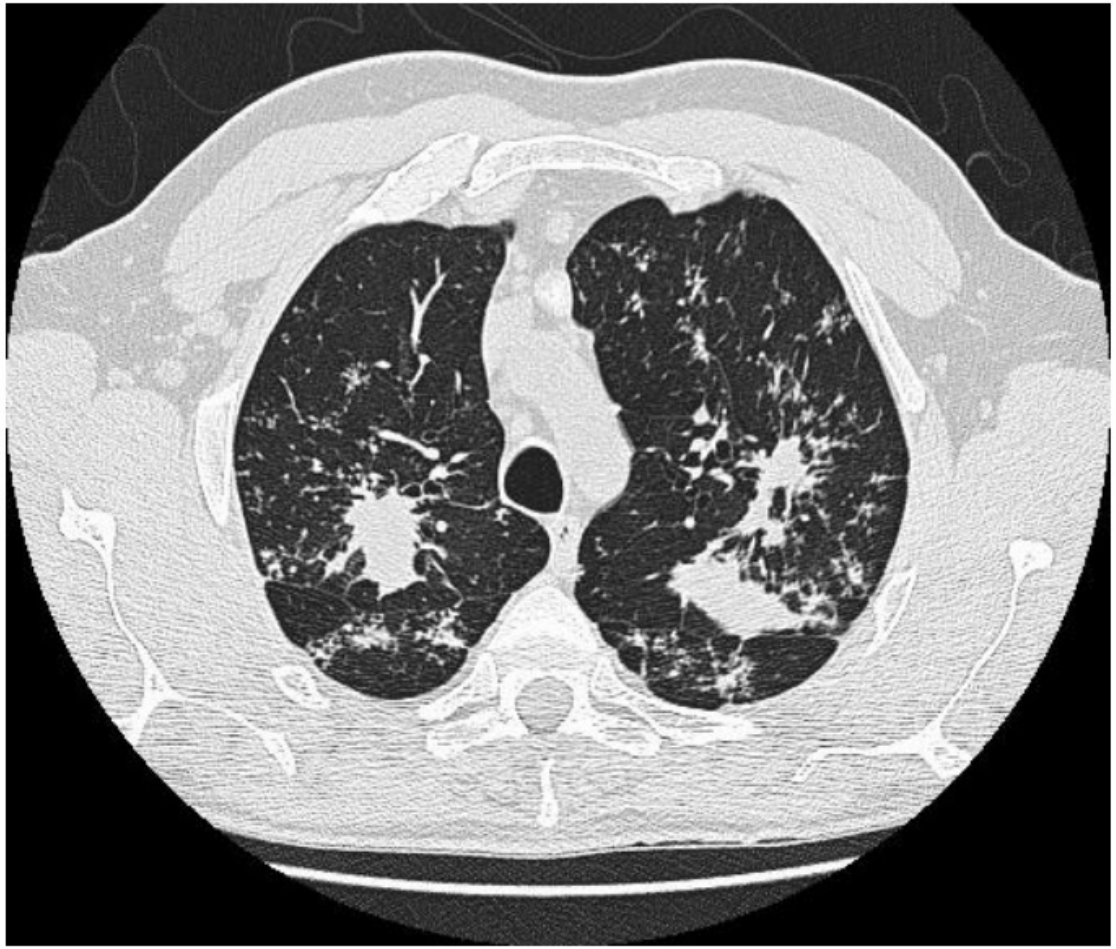
Cottin V et al. Clin Chest Med 2016

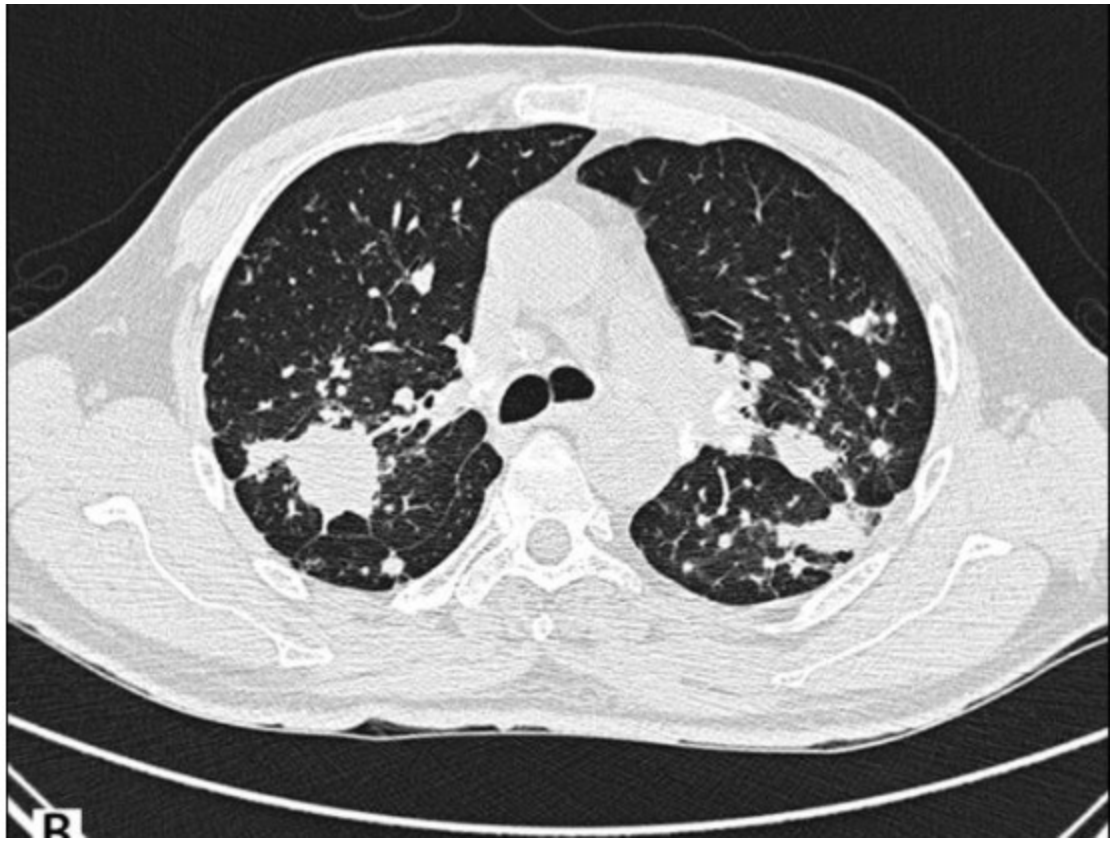
Bilateral peripheral consolidation is characteristic in chronic eosinophilic pneumonia (CEP)

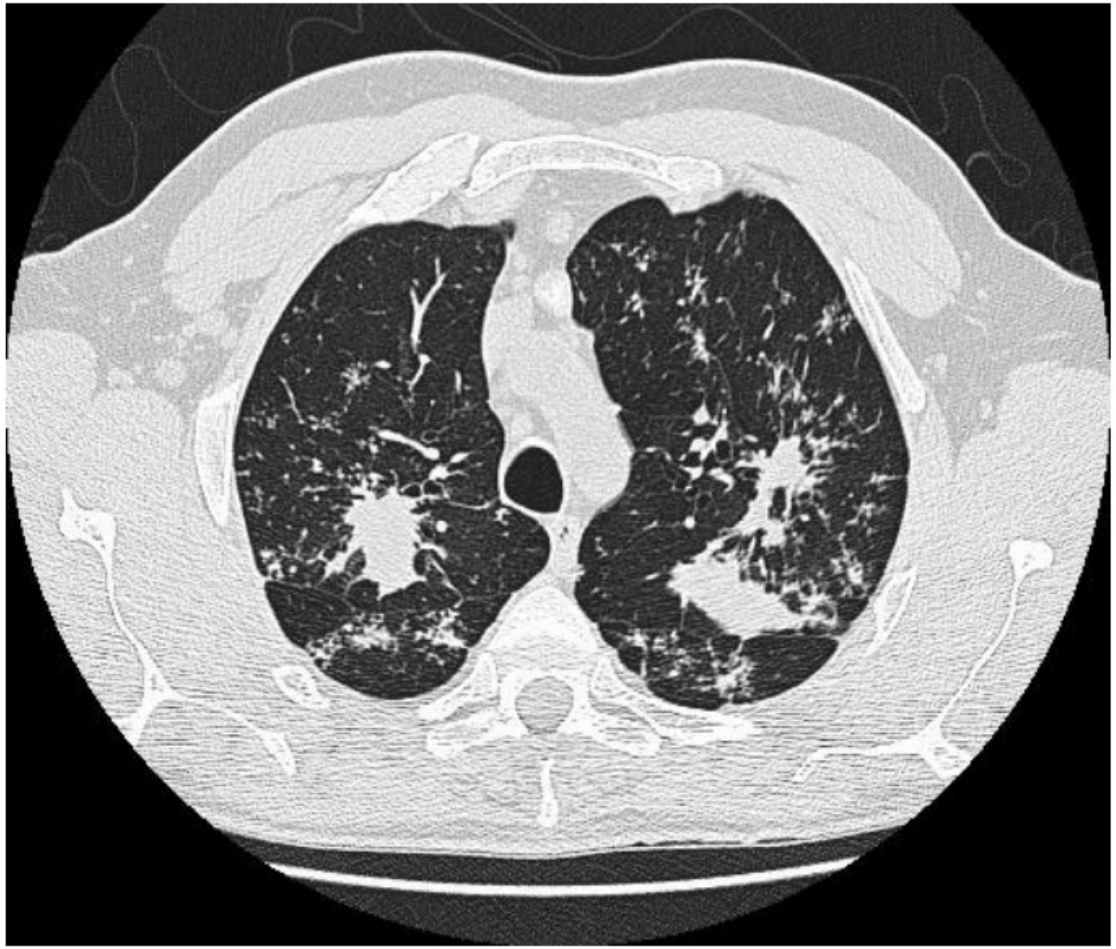
ILD

What am I?



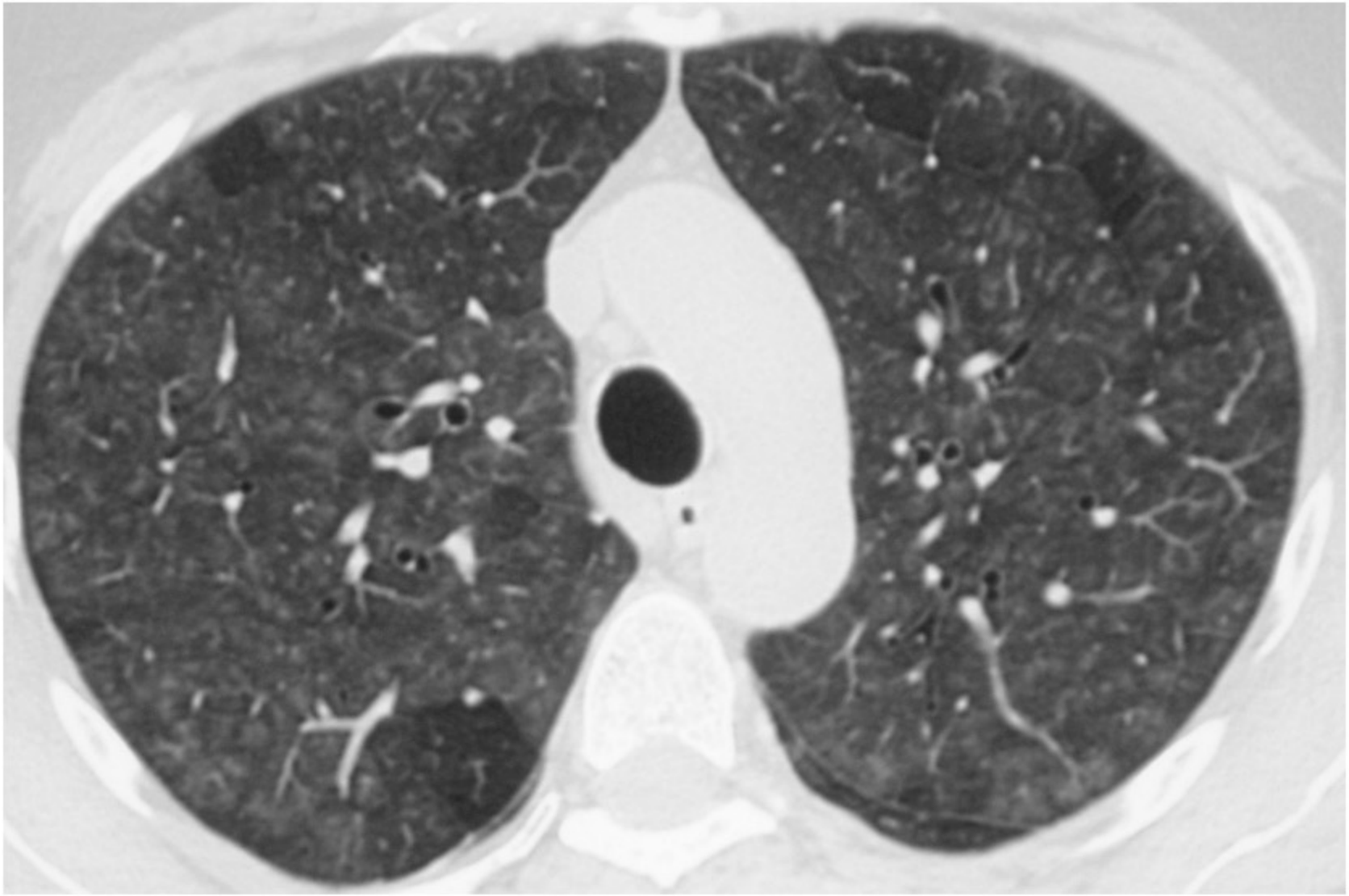






Images of upper-zone nodular infiltrates with bronchovascular distribution on CT scan of chest are consistent with sarcoidosis.

What am I?



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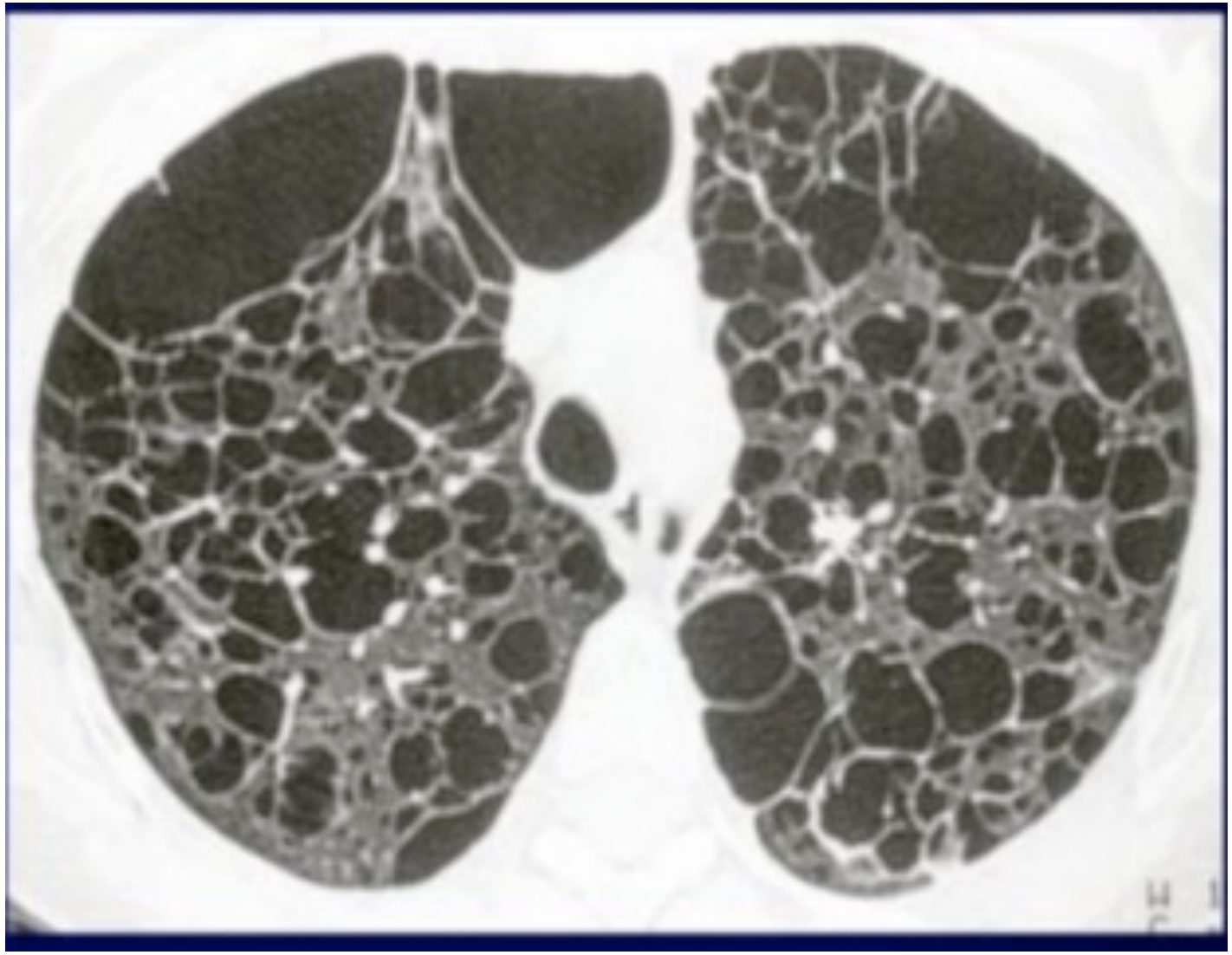

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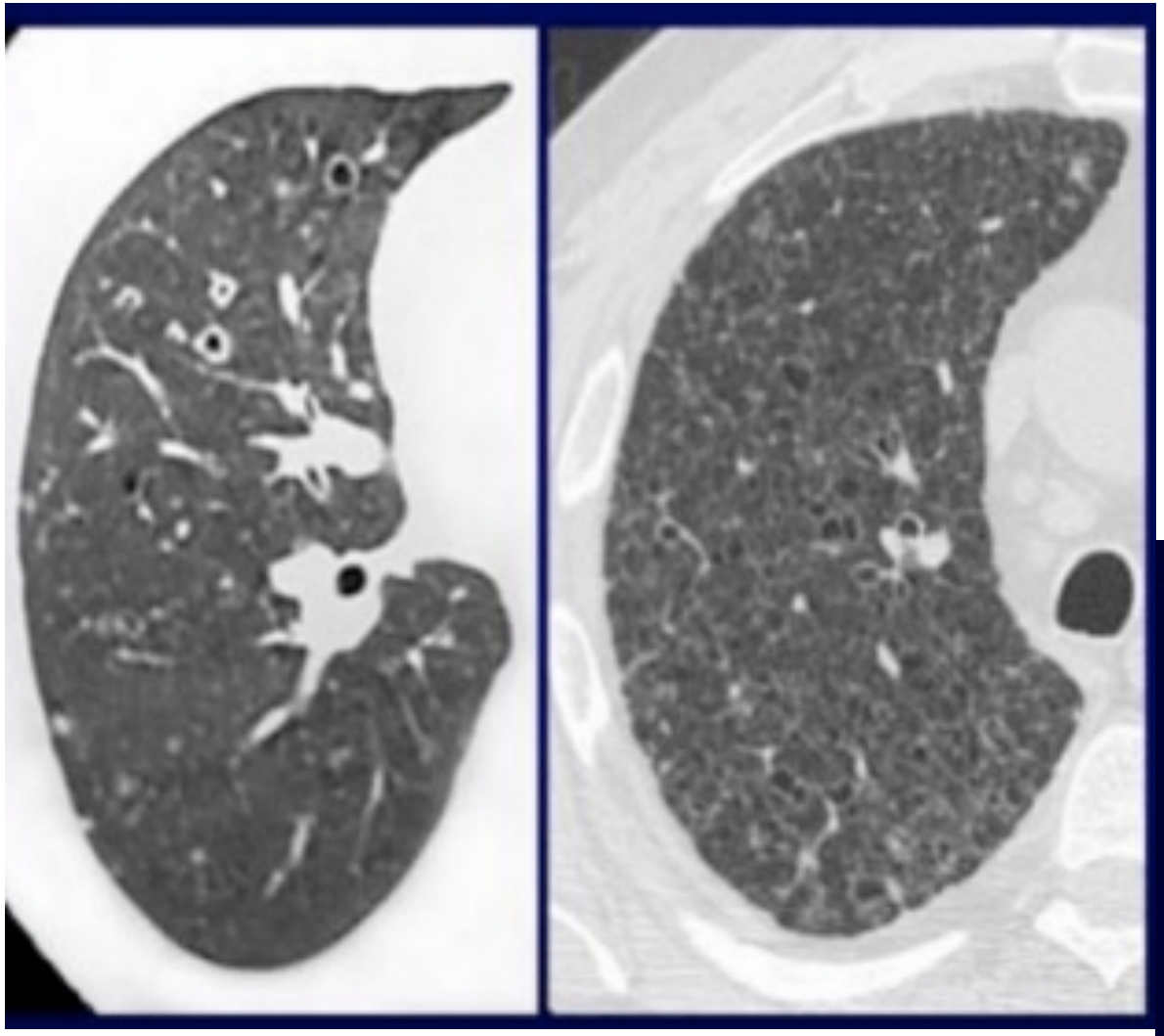
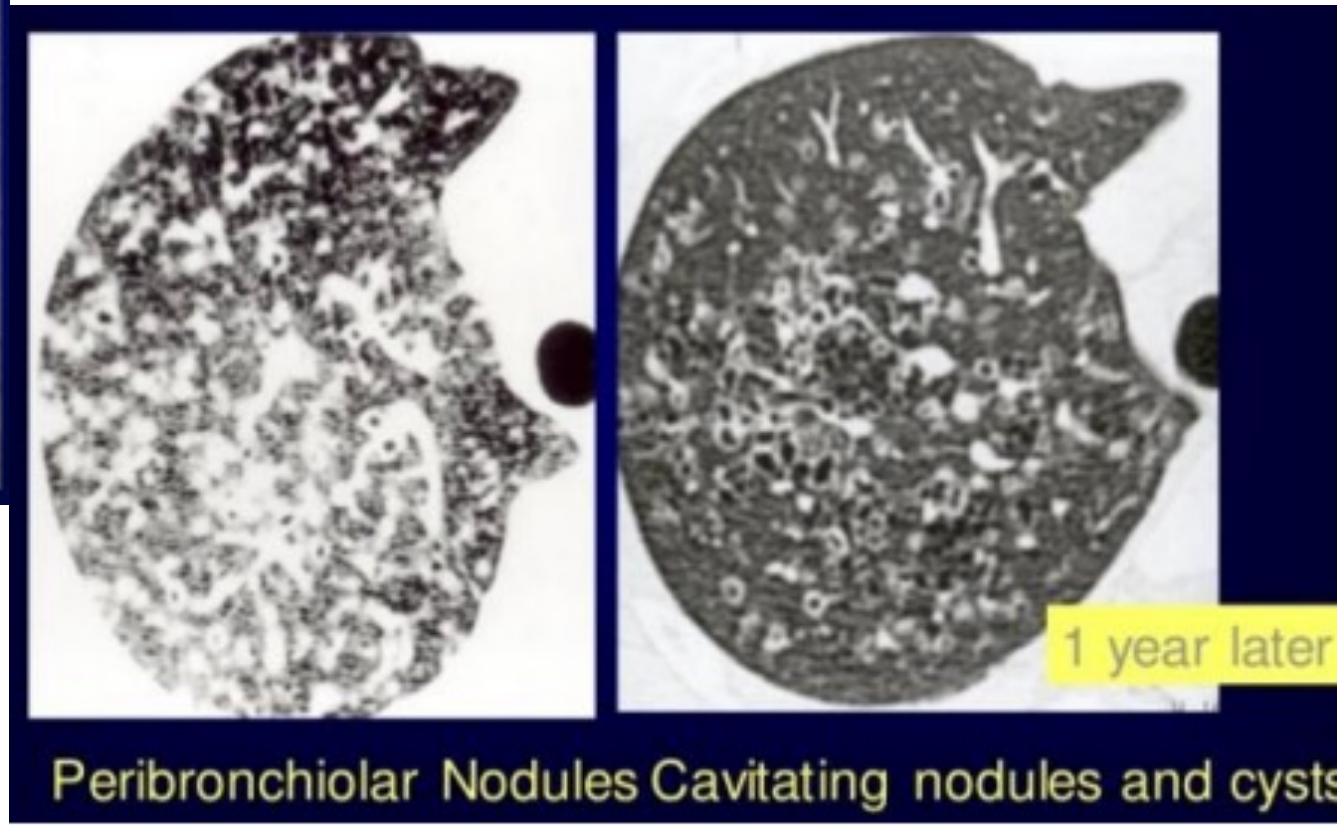



1 year later
Peribronchiolar Nodules
Cavitating nodules and cysts

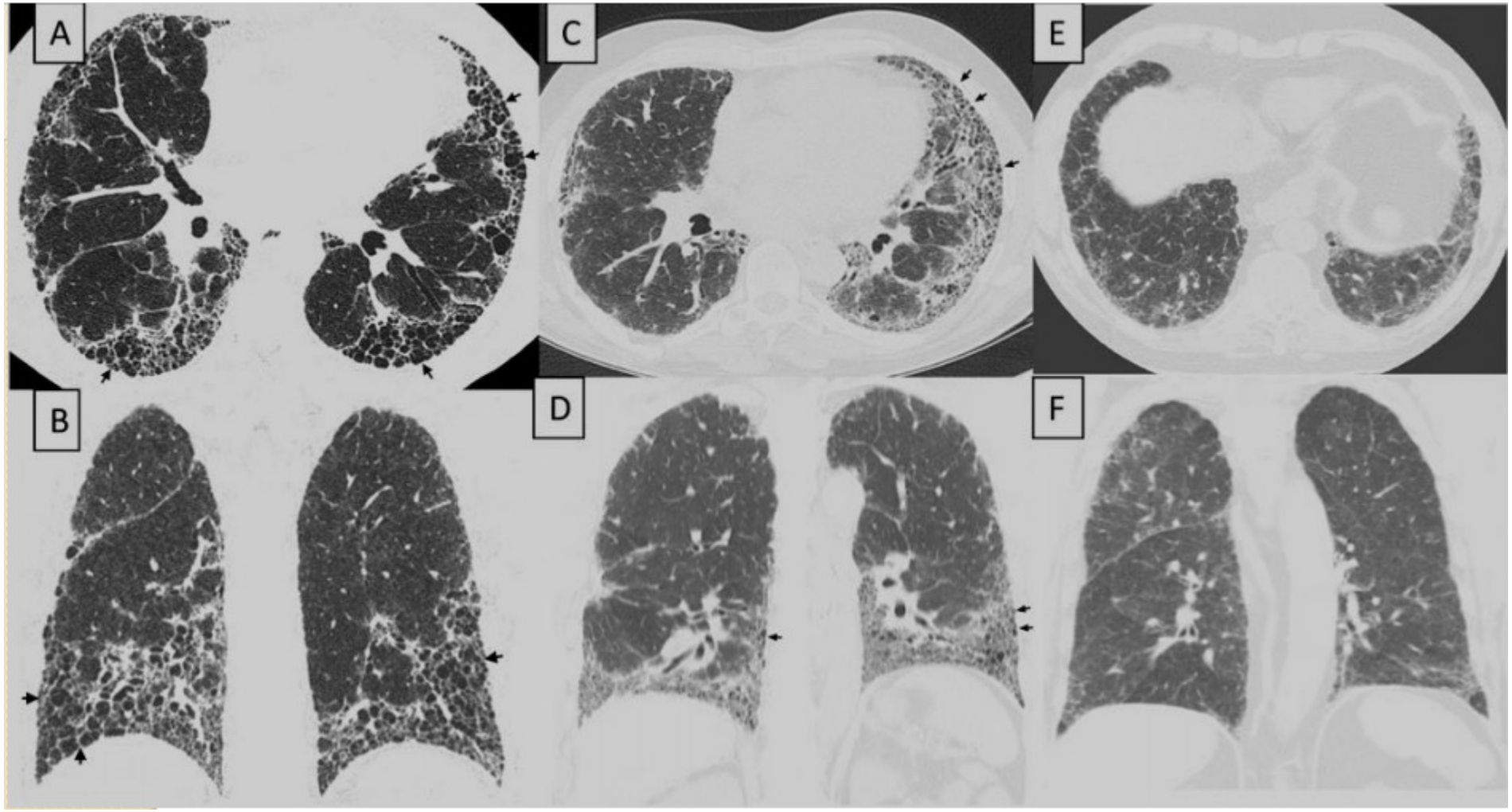
Langerhans Cell Histiozytosis

Key Features

- Upper lobe predominance
- Combination of cysts and noduli
- Characteristic stages
- Increased Lung volume
- Sparing of costophrenic angle

SMOKING

What am I?



Idiopathic pulmonary fibrosis

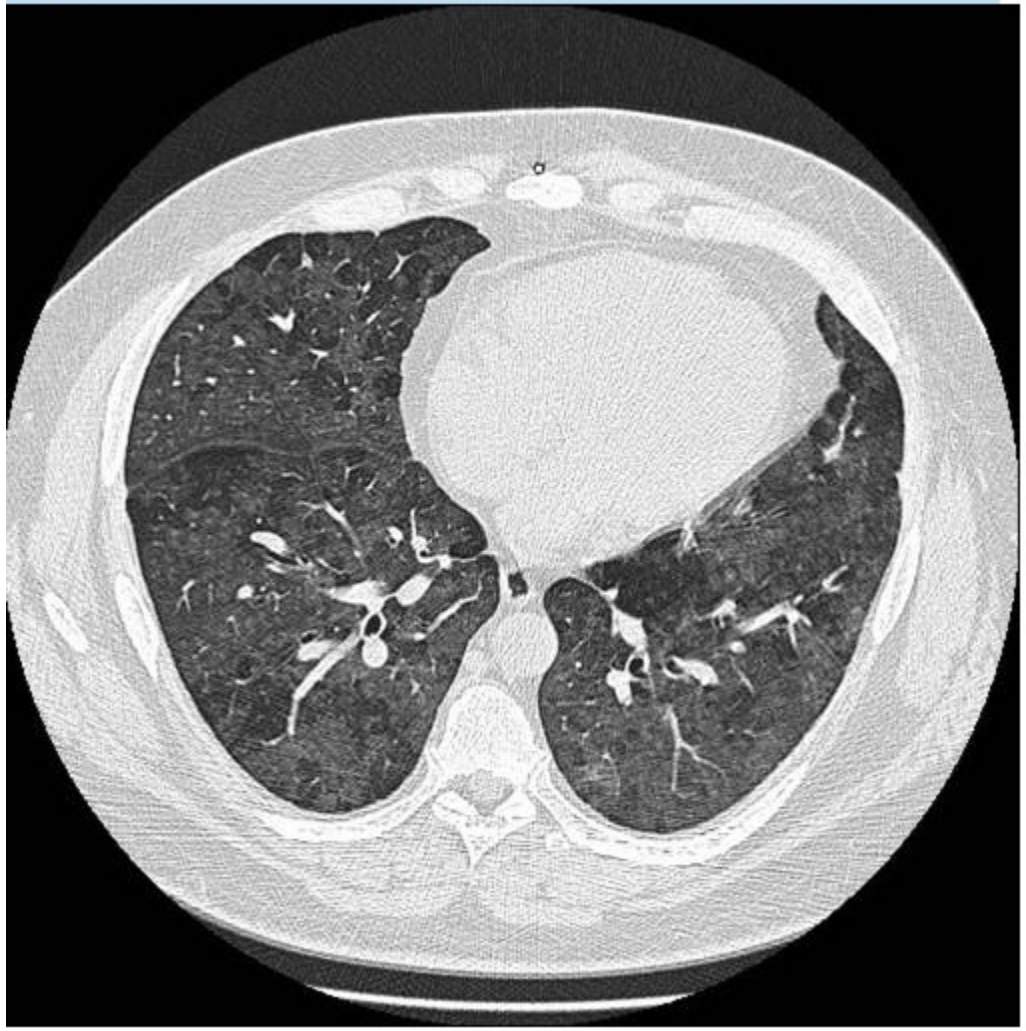
- Bilateral
- Predominantly basal changes
- Predominantly subpleural

- Reticular nodular
- Honey combing
- Traction bronchiectasis
- Minimal ground glass

- Architectural distortion - fibrosis
- Reduced lung volume

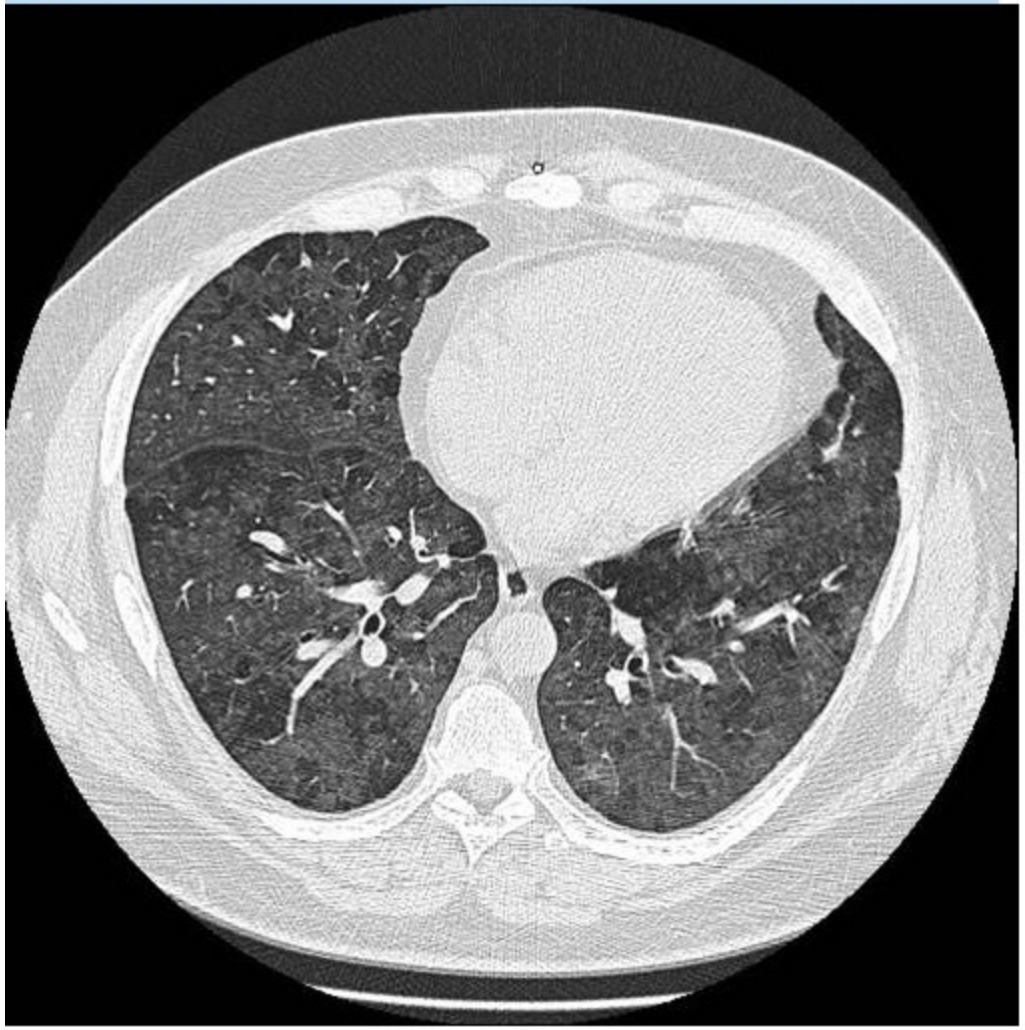
What am I?

high-resolution CT scan of chest see image



- HP
- DD (HF)

high-resolution CT scan of chest see image



Correct answer: B

Explanation

The patient is overweight, with evidence of pulmonary hypertension and reduced left ventricle function, and has risk factors for hypersensitivity pneumonitis. The lung function shows reduced gas transfer, and the CT scan shows ground-glass opacification with mosaicism, which would be more consistent with hypersensitivity pneumonitis than with heart failure.

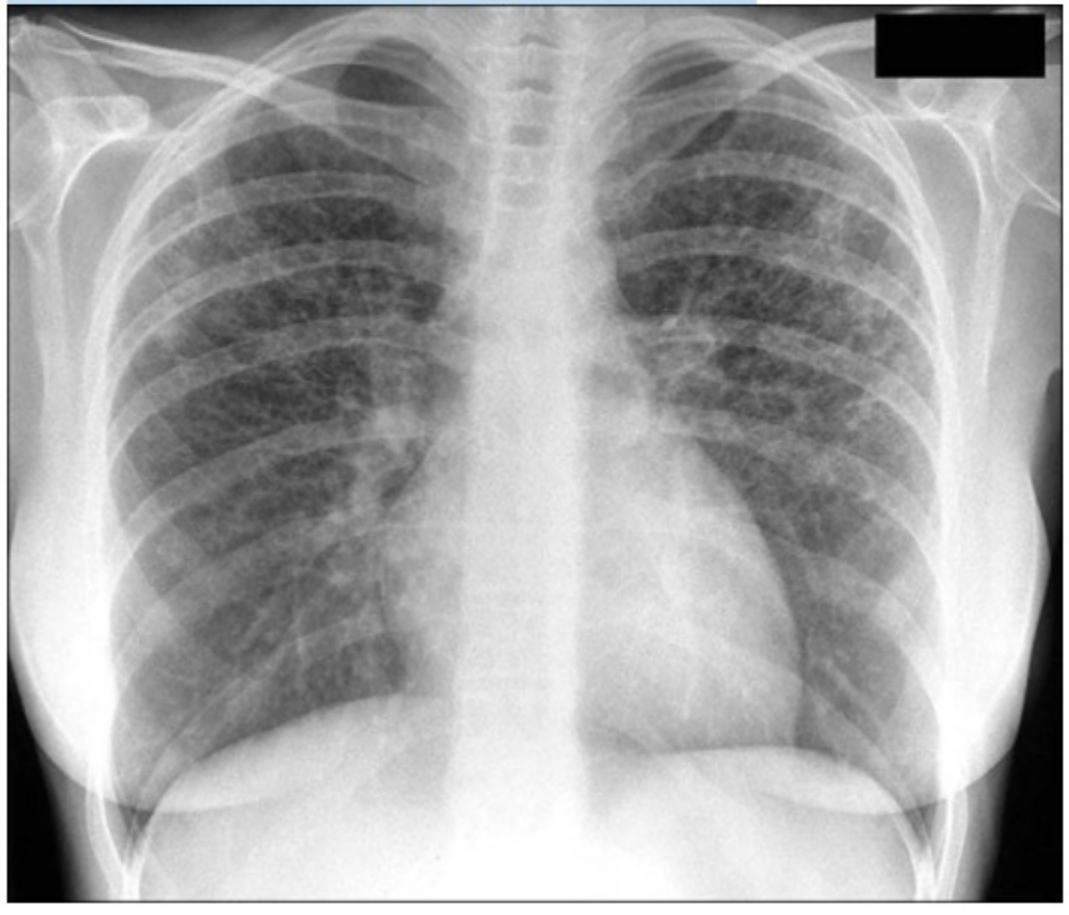
A 35-year-old woman presented with increasing breathlessness on exertion. There was no cough, sputum production or breathlessness at rest. She had sustained a spontaneous pneumothorax at the age of 29, and had undergone a lumpectomy and chemotherapy for breast cancer 2 years previously. She was not taking any medication. There was no family history of lung disease. She had smoked 8 cigarettes per day for 15 years.

Investigations:

lung function tests:			
	actual value	% predicted	SR*
FEV_1	1.8 L	68	–2.2
FVC	3.0 L	98	–0.1
FEV_1/FVC ratio	59%	71	–3.7

*SR = standardised residual. Normal range for all parameters is –1.64 to +1.64.

chest X-ray see image



Answers

A: α_1-antitrypsin deficiency
B: COPD
C: Langerhans' cell histiocytosis
D: lymphangitis carcinomatosa
E: metastatic disease

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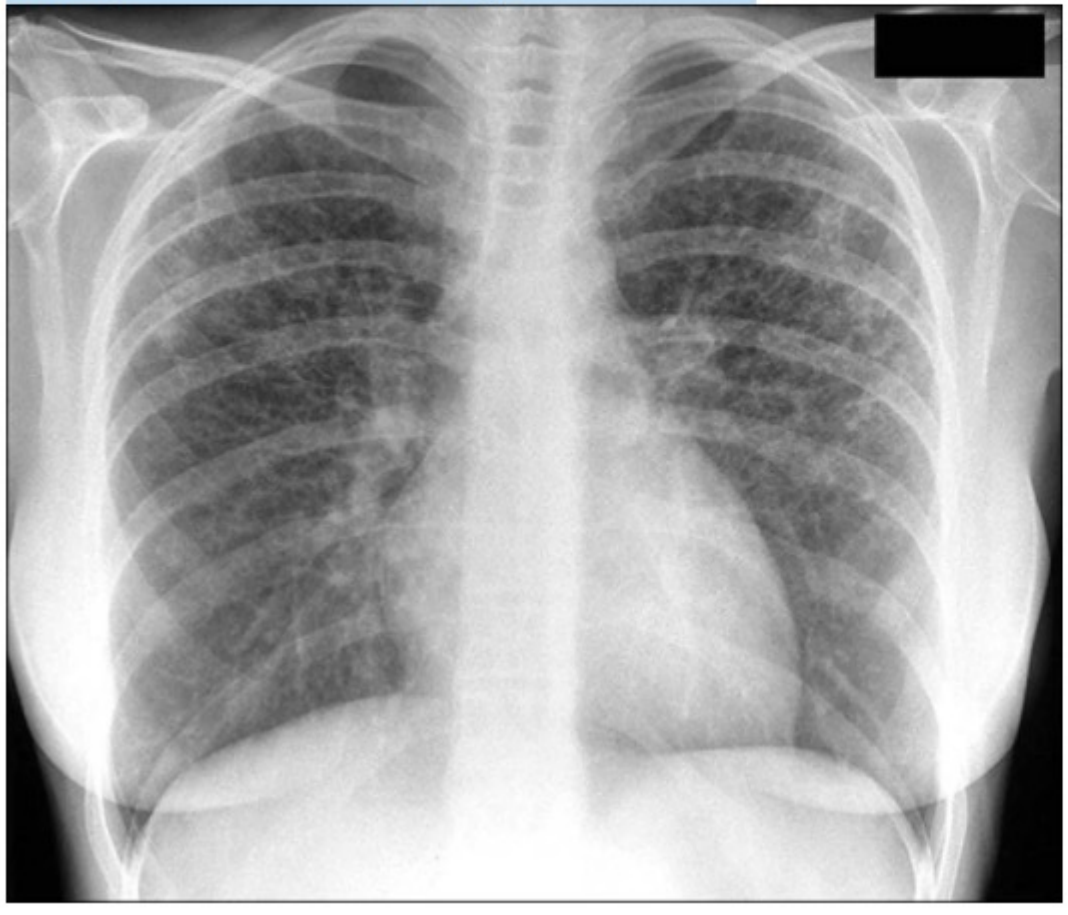
chest X-ray see image



Answers

A: α_1-antitrypsin deficiency
B: COPD
C: Langerhans' cell histiocytosis
D: lymphangitis carcinomatosa
E: metastatic disease

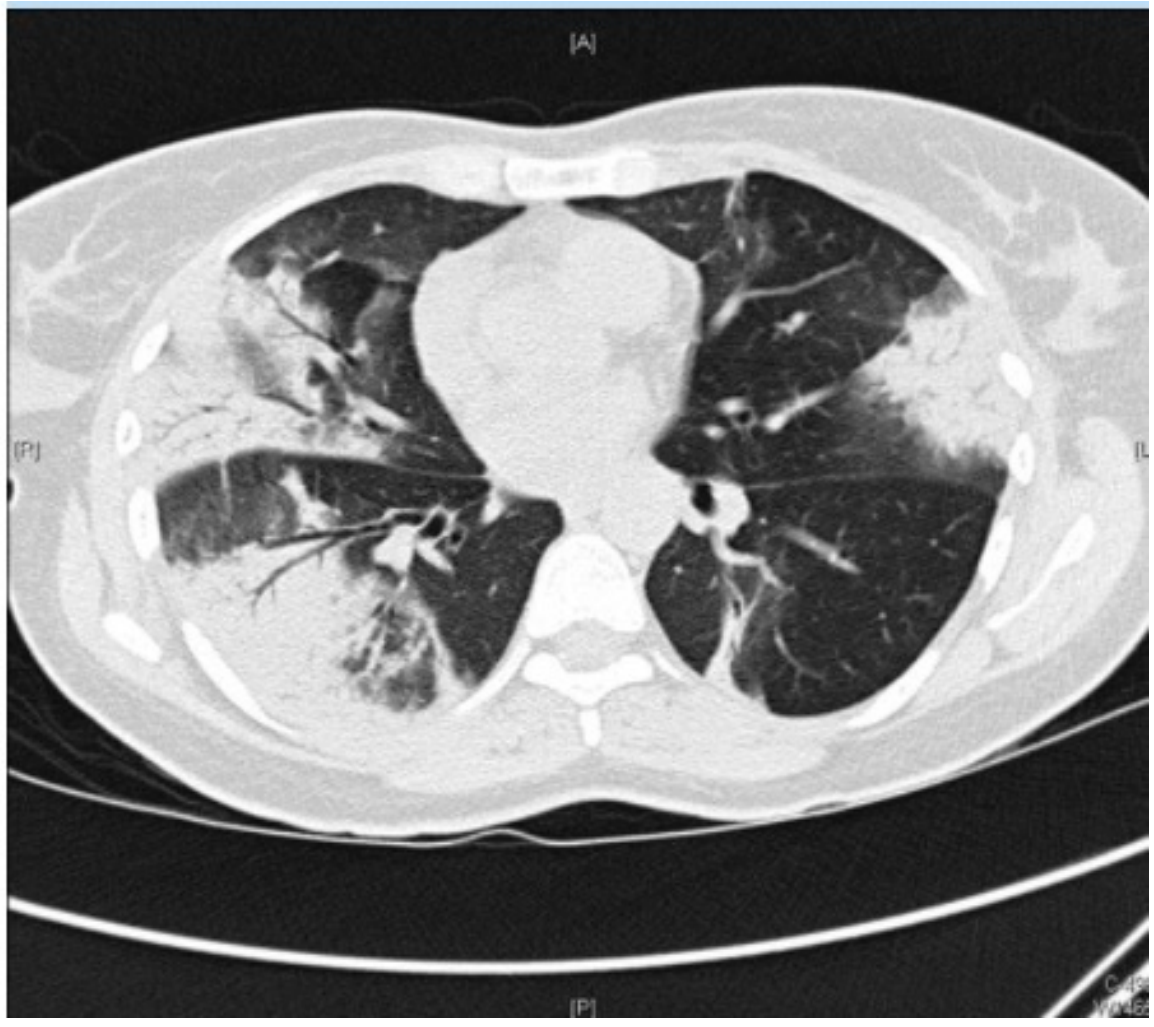
Correct answer: C

Explanation

The patient, who is a smoker, has evidence of airflow obstruction and a chest X-ray showing diffuse bilateral upper zone predominant nodular and cystic changes consistent with Langerhans' cell histiocytosis.

- A 66-year-old woman was referred with a 2-month history of malaise, breathlessness and a dry cough. These had been preceded by the symptoms of a chest infection.
- Despite two courses of antibiotics, she had not improved. Previously, she had been fit and well, with no serious illnesses. She was a lifelong non-smoker. Her general practitioner had arranged a chest X-ray 1 month previously, which was reported as showing inflammatory shadowing at the right upper zone and base.
- Physical examination showed evidence of some weight loss. On auscultation of the chest, there were diminished breath sounds and bronchial breathing at the right base, but no other abnormal findings.

haemoglobin	101 g/L (115–165)
white cell count	13.1 x 10^9/L (4.0–11.0)
neutrophil count	6.3 x 10^9/L (1.5–7.0)
lymphocyte count	2.3 x 10^9/L (1.5–4.0)
monocyte count	0.5 x 10^9/L (<0.8)
eosinophil count	2.30 x 10^9/L (0.04–0.40)
basophil count	0.05 x 10^9/L (<0.1)
platelet count	430 x 10^9/L (150–400)
ESR	12 mm/1st h (<30)
CT scan of chest	see image



•A: cryptogenic organising pneumonia
•B: eosinophilic pneumonia
•C: lepidic adenocarcinoma (bronchioloalveolar carcinoma)
•D: pulmonary tuberculosis
•E: sarcoidos

haemoglobin	101 g/L (115–165)
white cell count	13.1 x 10^9/L (4.0–11.0)
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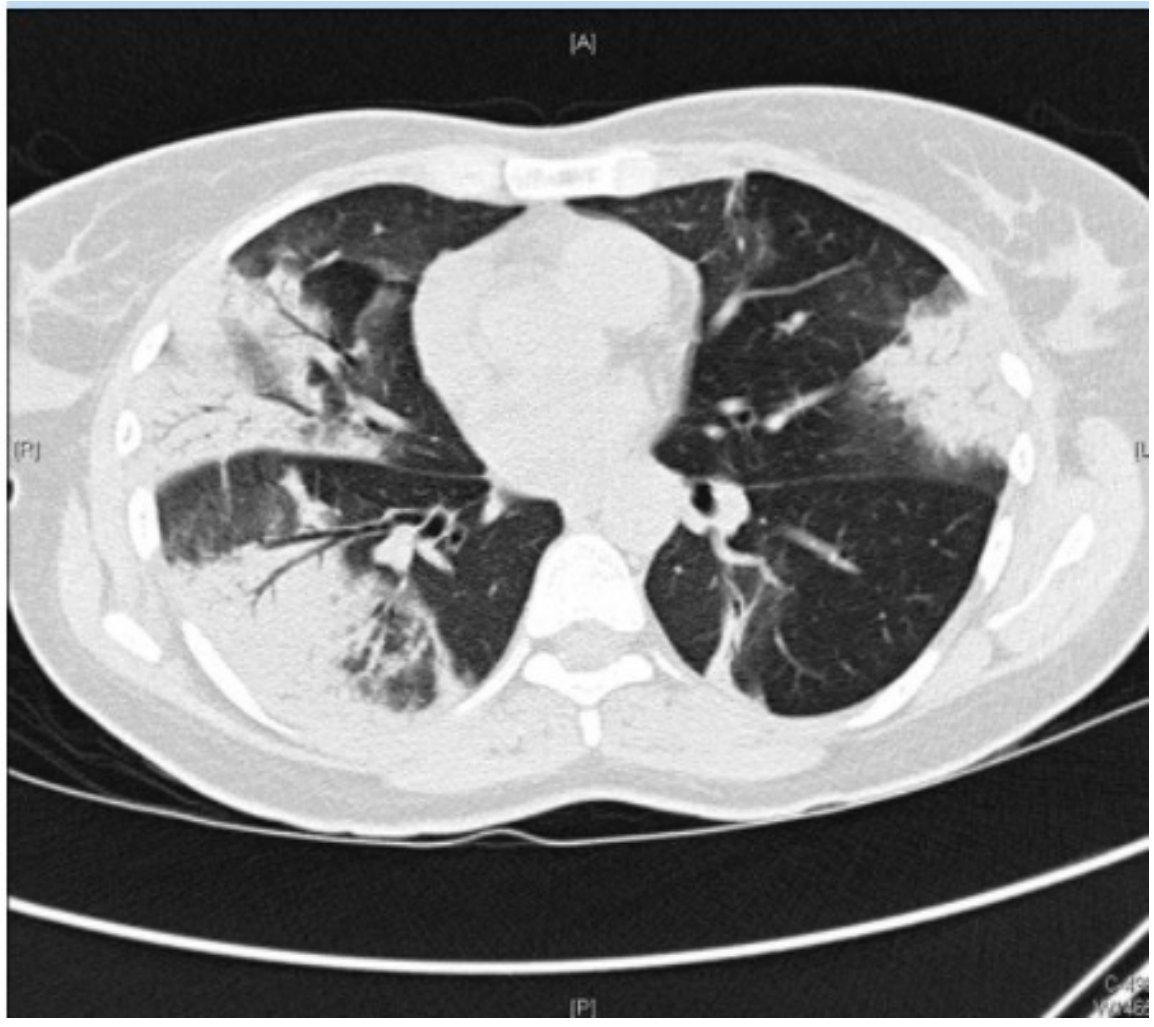


- A: cryptogenic organising pneumonia
- B: eosinophilic pneumonia
- C: lepidic adenocarcinoma (bronchioloalveolar carcinoma)
- D: pulmonary tuberculosis
- E: sarcoidos

B

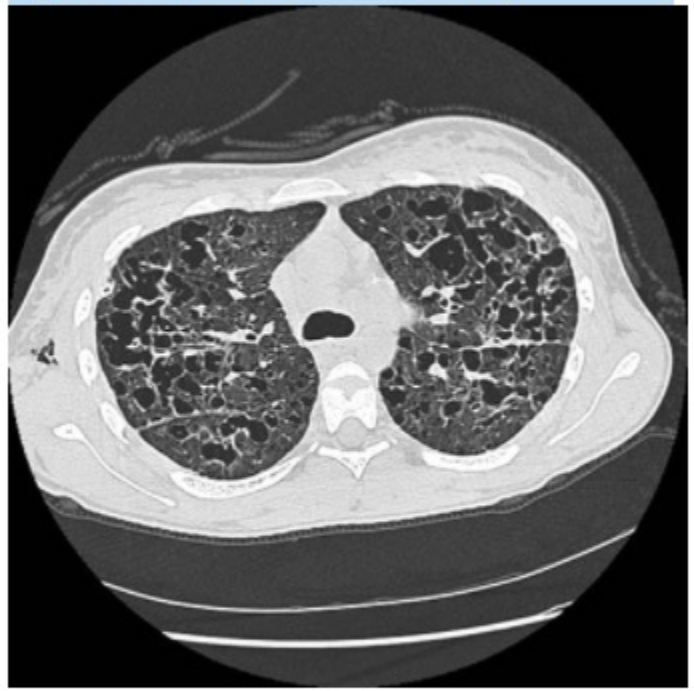
CT scan shows peripheral, bilateral consolidative changes. No response to antibiotics would suggest an inflammatory process. The CT scan is not consistent with sarcoid or tuberculosis.

While this could be cryptogenic organising pneumonia, radiologically the peripheral eosinophilia would suggest eosinophilic pneumonia.

A 27-year-old woman was seen for review following treatment for a pneumothorax. Before that admission, she had never experienced any breathlessness or any other respiratory symptoms. She smoked 20 cigarettes per day.

Investigations:

chest X-ray	diffusely abnormal
high-resolution CT scan of thorax	see image

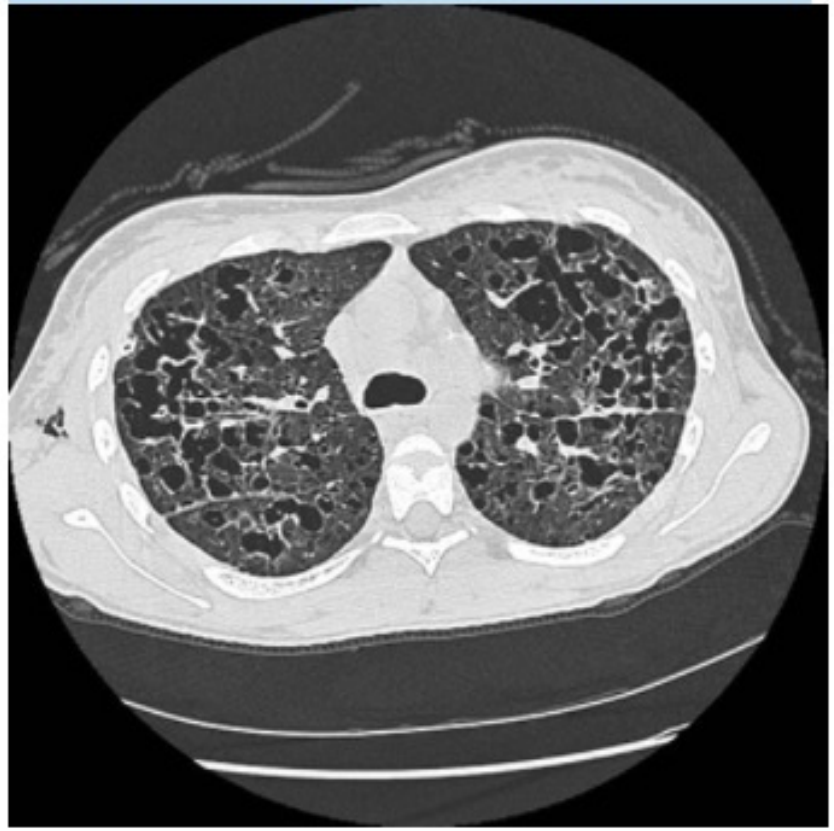


What is the most likely diagnosis?

Answers

A: cystic fibrosis
B: emphysema
C: lymphangioleiomyomatosis
D: pulmonary Langerhans' cell histiocytosis
E: sarcoidosis

high-resolution CT scan of thorax see image



What is the most likely diagnosis?

Answers

A: cystic fibrosis
B: emphysema
C: lymphangioleiomyomatosis
D: pulmonary Langerhans' cell histiocytosis
E: sarcoidosis

Correct answer: D

Explanation

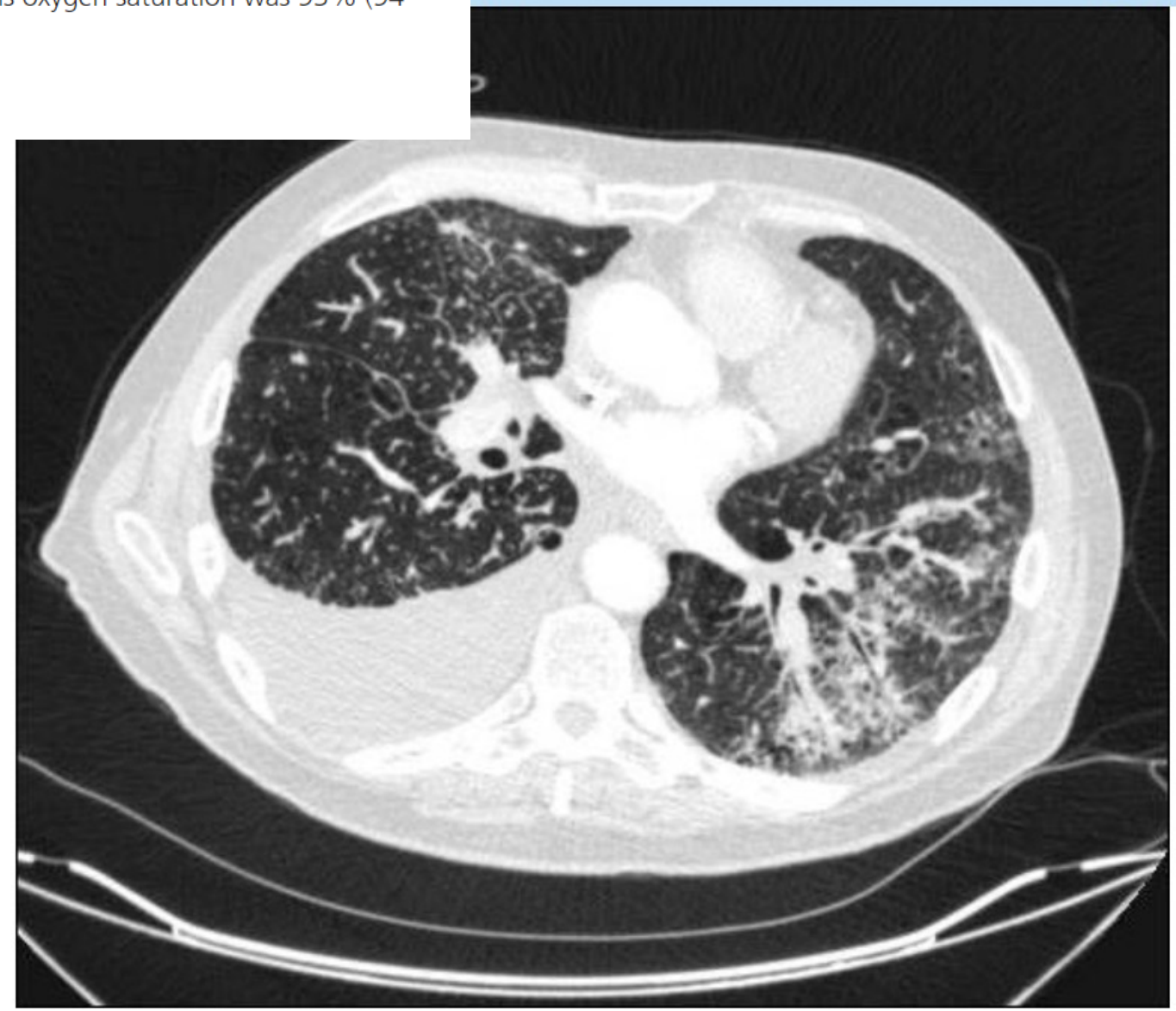
The patient is a smoker with CT scan evidence of bilateral irregular cystic disease consistent with pulmonary Langerhans' cell histiocytosis.

A 65-year-old landscape gardener presented with a 3-week history of worsening dyspnoea and a non-productive cough. He was a lifelong non-smoker and was not taking any medication. His past medical history was unremarkable.

On examination, he was mildly tachypnoeic on mild exertion. His oxygen saturation was 93% (94–98) breathing air. Chest examination was unremarkable.

Investigations:

rax see image



Answers

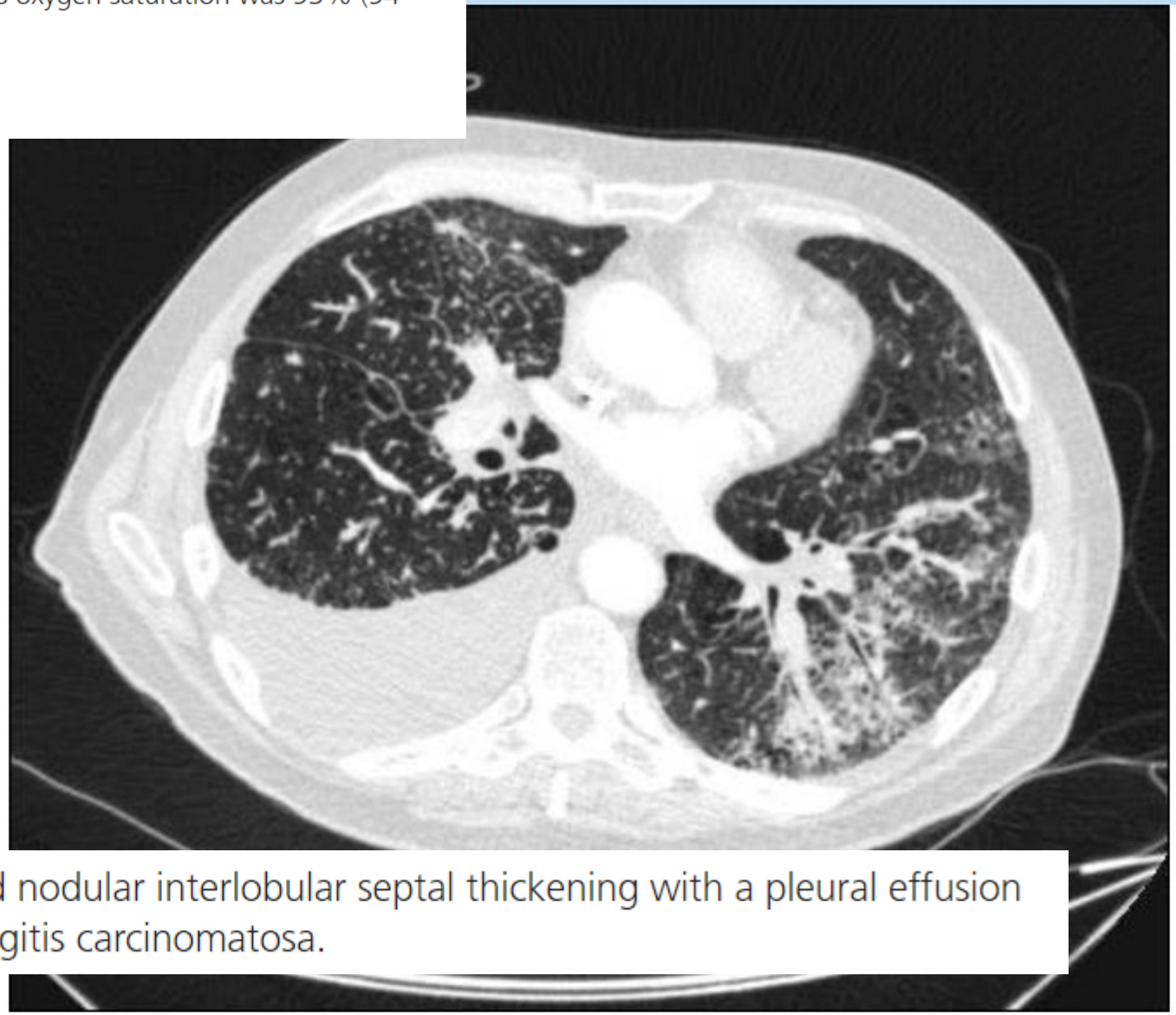
A: hypersensitivity pneumonitis
B: lymphangitis carcinomatosa
C: non-specific interstitial pneumonitis
D: sarcoidosis
E: viral pneumonia

A 65-year-old landscape gardener presented with a 3-week history of worsening dyspnoea and a non-productive cough. He was a lifelong non-smoker and was not taking any medication. His past medical history was unremarkable.

On examination, he was mildly tachypnoeic on mild exertion. His oxygen saturation was 93% (94–98) breathing air. Chest examination was unremarkable.

Investigations:

rax see image



Answers

A: hypersensitivity pneumonitis
B: lymphangitis carcinomatosa
C: non-specific interstitial pneumonitis
D: sarcoidosis
E: viral pneumonia

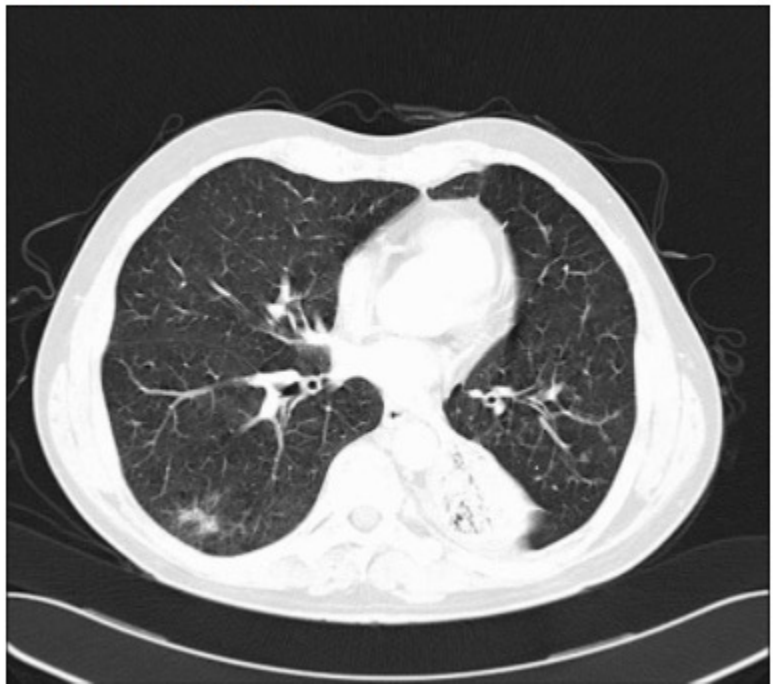
B

The CT image shows irregular and nodular interlobular septal thickening with a pleural effusion which is typically seen in lymphangitis carcinomatosa.

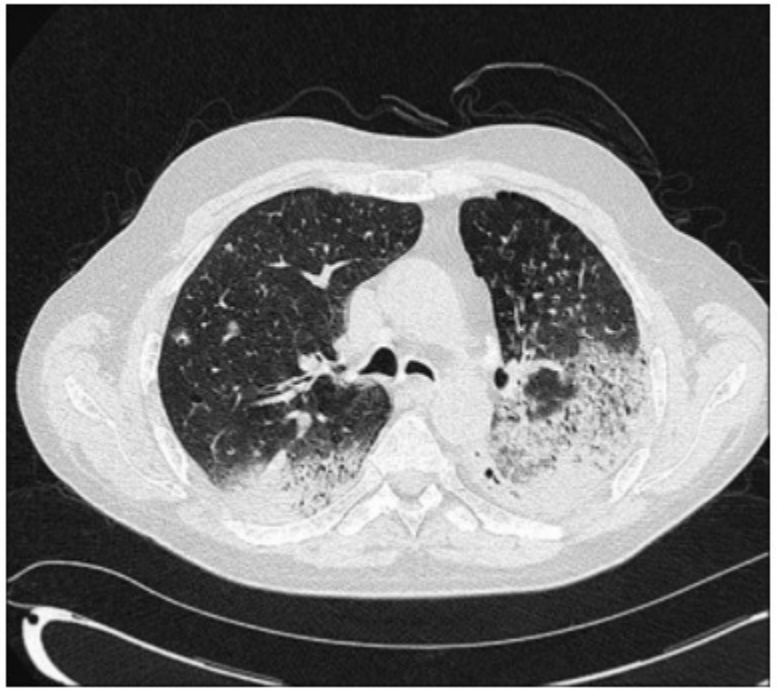
- A 62-year-old Asian man, with a history of treated tuberculosis 3 years previously, was referred with increasing breathlessness. He had received repeated courses of prednisolone and antibiotics without benefit. He had a 5 pack-year smoking history, and had previously worked as a plumber.

Serum IgE aspergillus	negative
sputum culture	negative for acid-fast and alcohol-fast bacilli

bronchoscopy — microbiology, cytology and blind distal biopsy all negative



The patient became progressively more breathless over the next 18 months, when a repeat scan was performed (see imag



What is the most likely diagnosis?

Answers

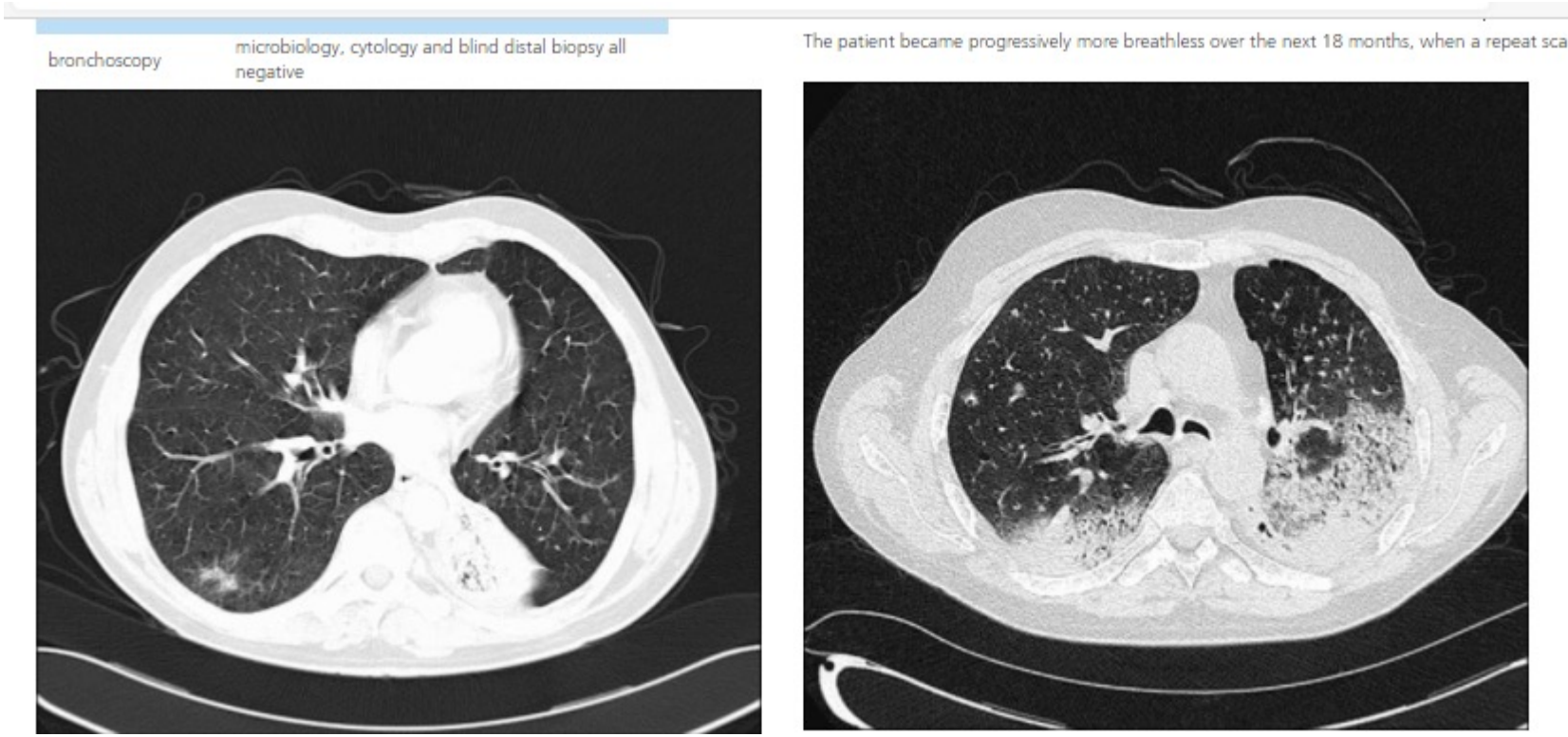
A: chronic necrotising aspergillosis
B: environmental mycobacterial infection
C: lepidic adenocarcinoma (bronchioloalveolar carcinoma)
D: resistant pulmonary Mycobacterium tuberculosis infection
E: vasculitis

- A 62-year-old Asian man, with a history of treated tuberculosis 3 years previously, was referred with increasing breathlessness. He had received repeated courses of prednisolone and antibiotics without benefit. He had a 5 pack-year smoking history, and had previously worked as a plumber.

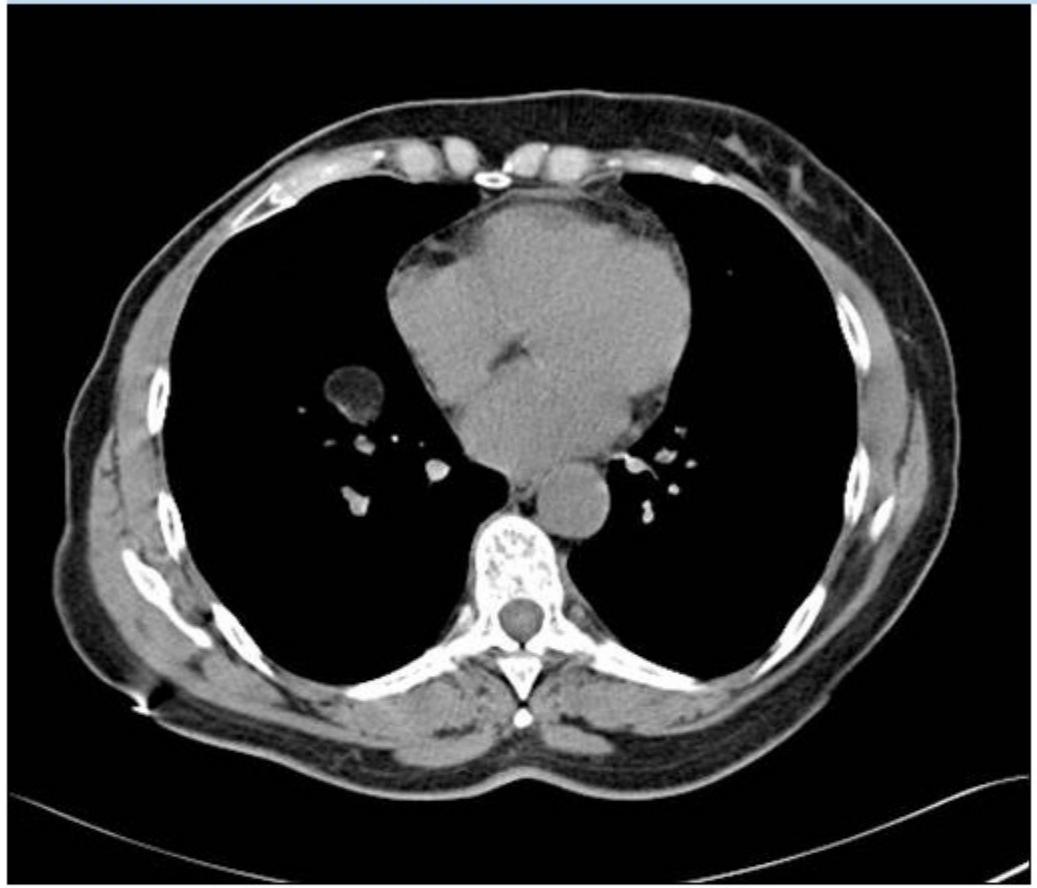
Serum IgE aspergillus	negative
sputum culture	negative for acid-fast and alcohol-fast bacilli

C

The first CT scan appearances show ground-glass attenuation, and the repeat scan shows tumour along the alveolar walls without stromal or vascular invasion and are consistent with lepidic adenocarcinoma.



CT scan of chest with intravenous contrast see image



What is the most likely diagnosis?

Answers

A: bronchocele
B: bronchogenic cyst
C: carcinoid tumour
D: hamartoma
E: lipoma

Hint: Same density are pericardial fat

Correct answer: E

Explanation

The right middle zone shadow in question does not take up contrast, so a carcinoid tumour is unlikely. It does not have the morphology of a bronchocele or bronchial cyst. It is of the same density as the pericardial fat, so is most likely to be a lipoma as opposed to a hamartoma