Challenges in the diagnosis and treatment of drug-susceptible tuberculosis: case-based problem solving

경북의대 이재희

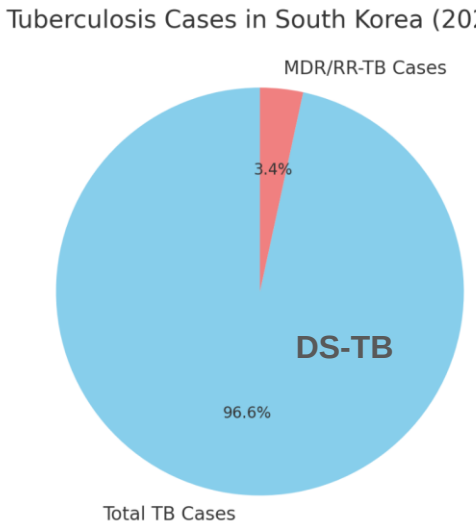
Treatment of DS-TB: simple?

2. 감수성결핵의 치료

권고요약

· 감수성결핵 치료의 표준처방은 2HRZE/4HR이다. 약제감수성검사 결과 이소니아지드 및 리팜핀에 감수성 결핵으로 확인된 경우에는 에탐부톨을 중단할 수 있다(IIB).

· 감수성결핵 환자에서 치료 시작 시 흉부X선에서 공동이 있고, 치료 2개월 후 시행한 객담 배양이 양성인 경우에는 유지 치료 기간의 연장을 고려할 수 있다(IIB).



MDR/RR-TB 의 치료

나. 치료의 일반 원칙

권고요약

· 분자생물학적 약제감수성검사에서 리팜핀 내성 유전자 변이가 확인되면 다제내성결핵 처방으로 치료를 시작한다(IIA).

· 효과적인 치료법과 약제를 선정하기 위해 과거 결핵 치료력과 약제감수성검사 결과를 동시에 고려해야 한다(IIIA).

· 적극적인 부작용 관리, 치료 과정에 대한 모니터링, 적절한 환자 관리가 병행되어야 한다(IIIA).

· 다제내성결핵 치료는 치료 경험이 많은 전문가에게 의뢰할 것을 권고한다(IIIA).

가. 퀴놀론 감수성 다제내성결핵

권고요약

· 6개월 BPaLM 요법[a] 또는 9개월 MDR-END 요법[b]을 사용하는 것을 권고한다(IA).

· 18-20개월 장기요법은 6개월 BPaLM 요법[a] 또는 9개월 MDR-END 요법[b]에 적합하지 않은 환자에게 사용하는 것을 권고한다(IA).

[a] 베다퀼린[B], 프레토마니드[Pa], 리네졸리드[L], 목시플록사신[M]

[b] 레보플록사신, 델라마니드, 리네졸리드, 피라진아미드

나. 퀴놀론 내성 다제내성결핵

권고요약

· 6개월 BPaL 요법[a]을 사용하는 것을 권고한다(IIA).

· 18-20개월 장기요법은 6개월 BPaL 요법[a]에 적합하지 않은 환자에게 사용하는 것을 권고한다(IIA).

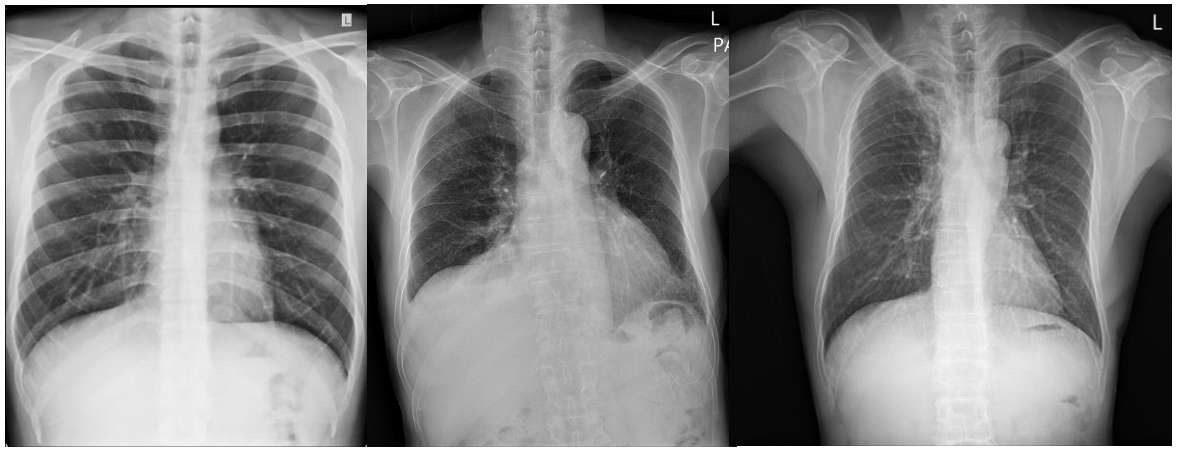
[a] 베다퀼린[B], 프레토마니드[Pa], 리네졸리드[L]

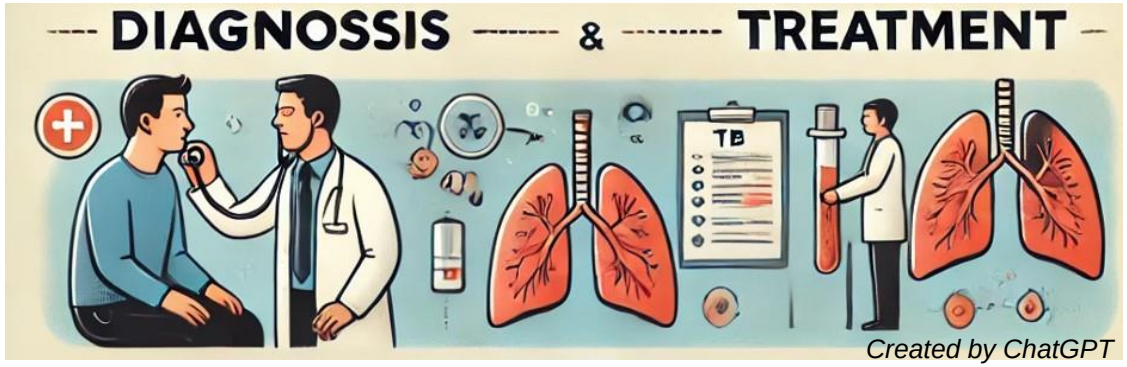
Korean guidelines for tuberculosis (5th edition), 2024

Annual Report on the Notified Tuberculosis in Korea, 2023

Contents

Case #1 Case #2 Case #3

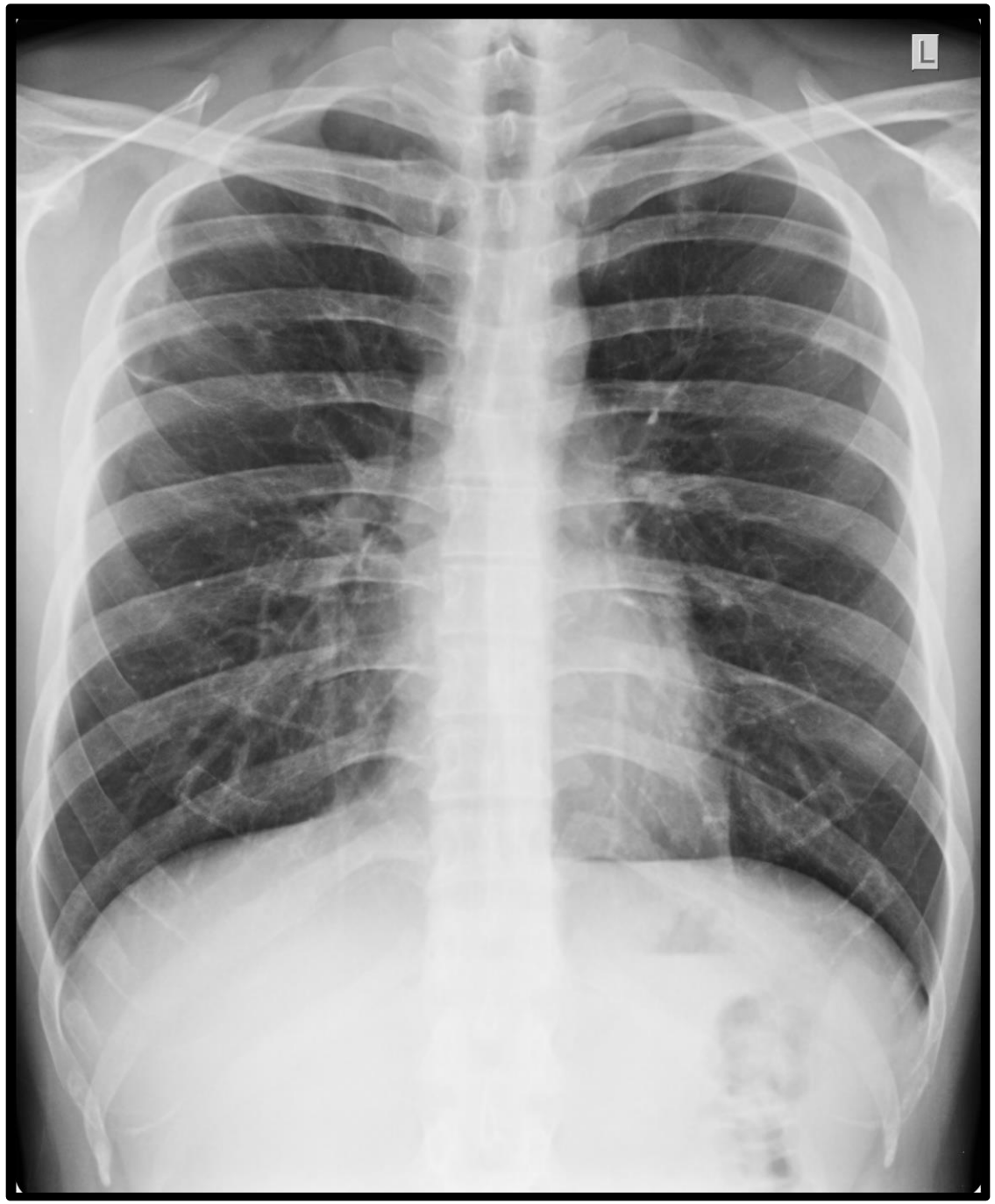




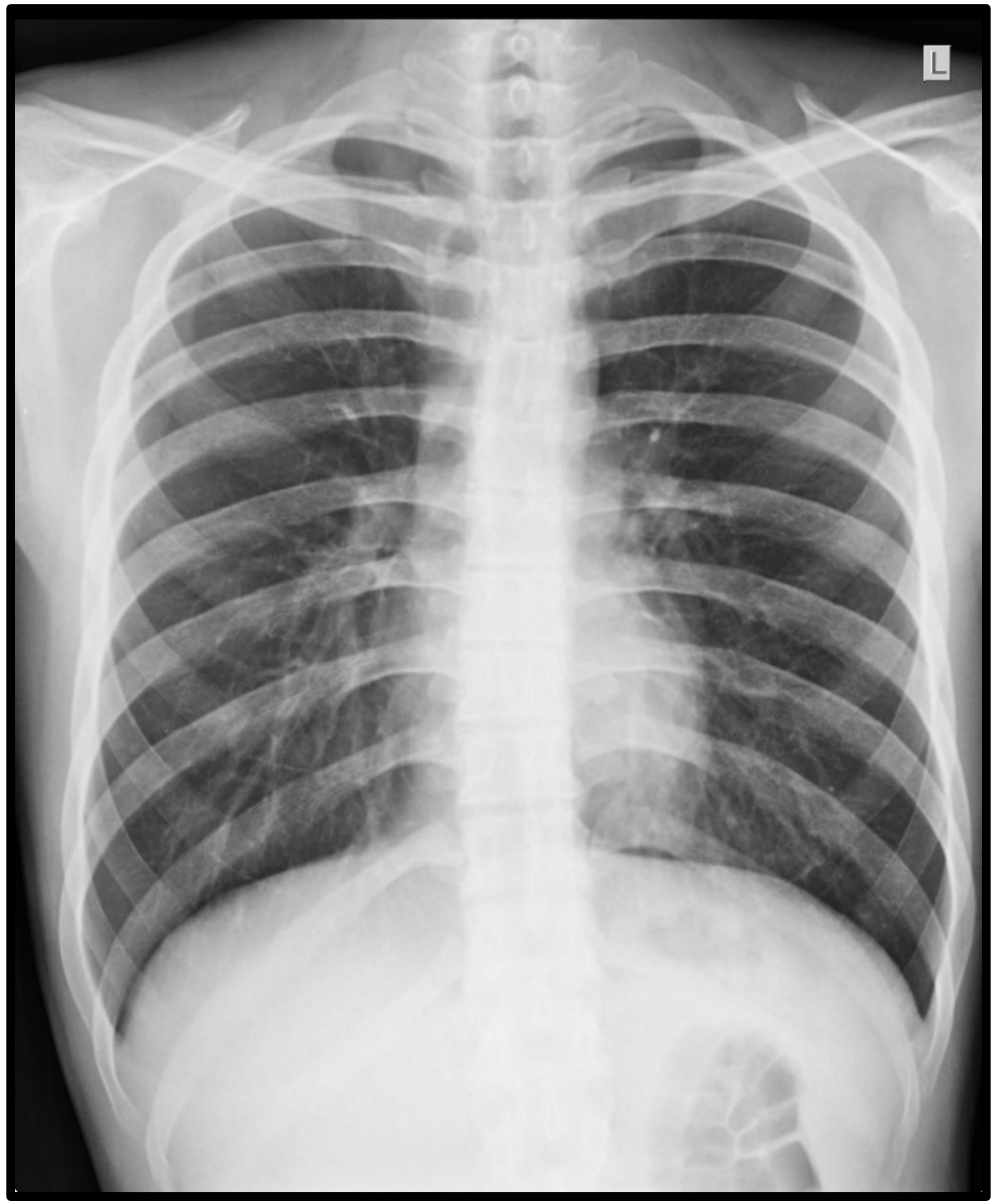
Created by ChatGPT

Case 1: 24/M

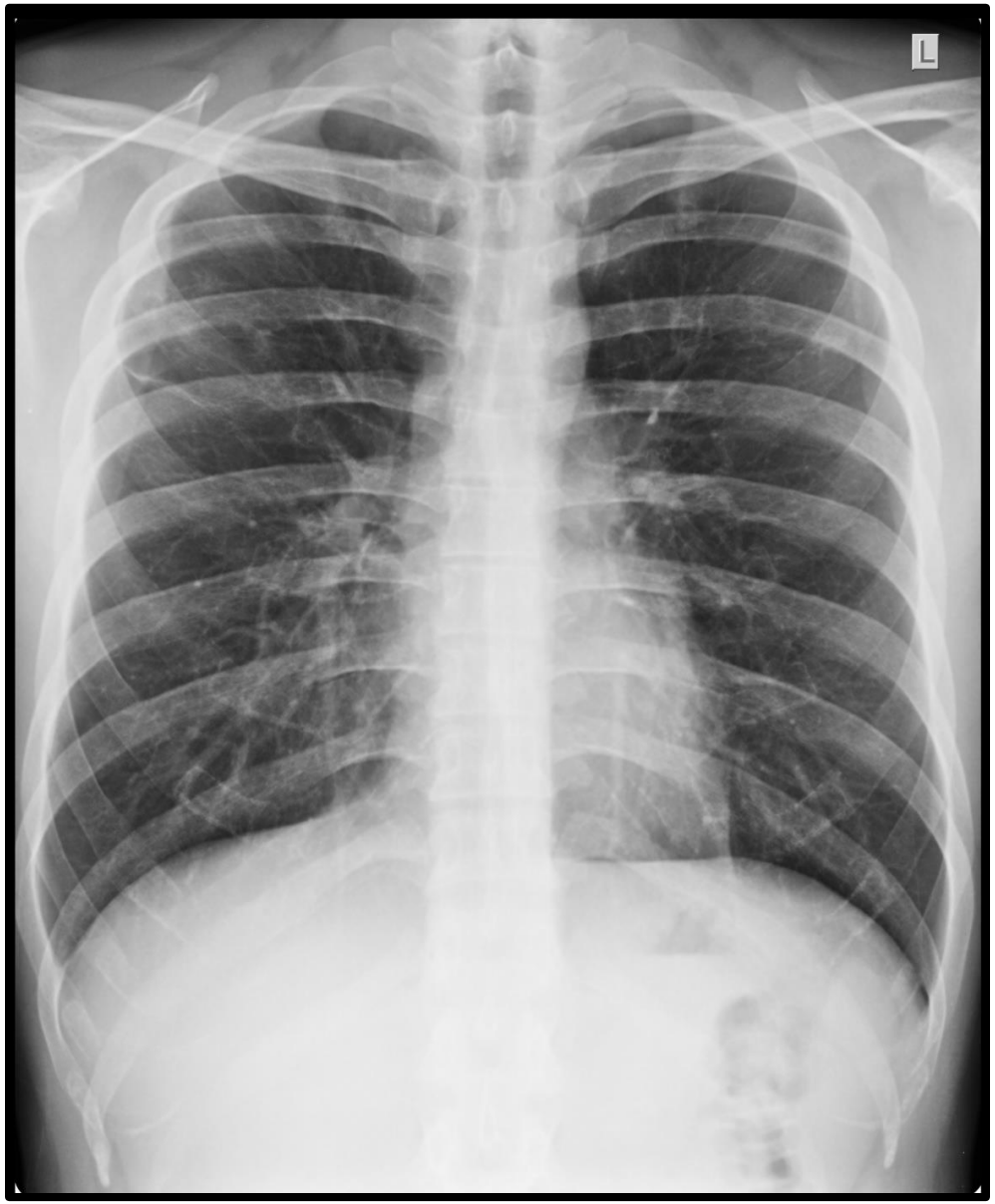
- Incidentally found CXR abnormality
- Mild sputum since starting smoking
- Current smoker (1PPD for 8y)



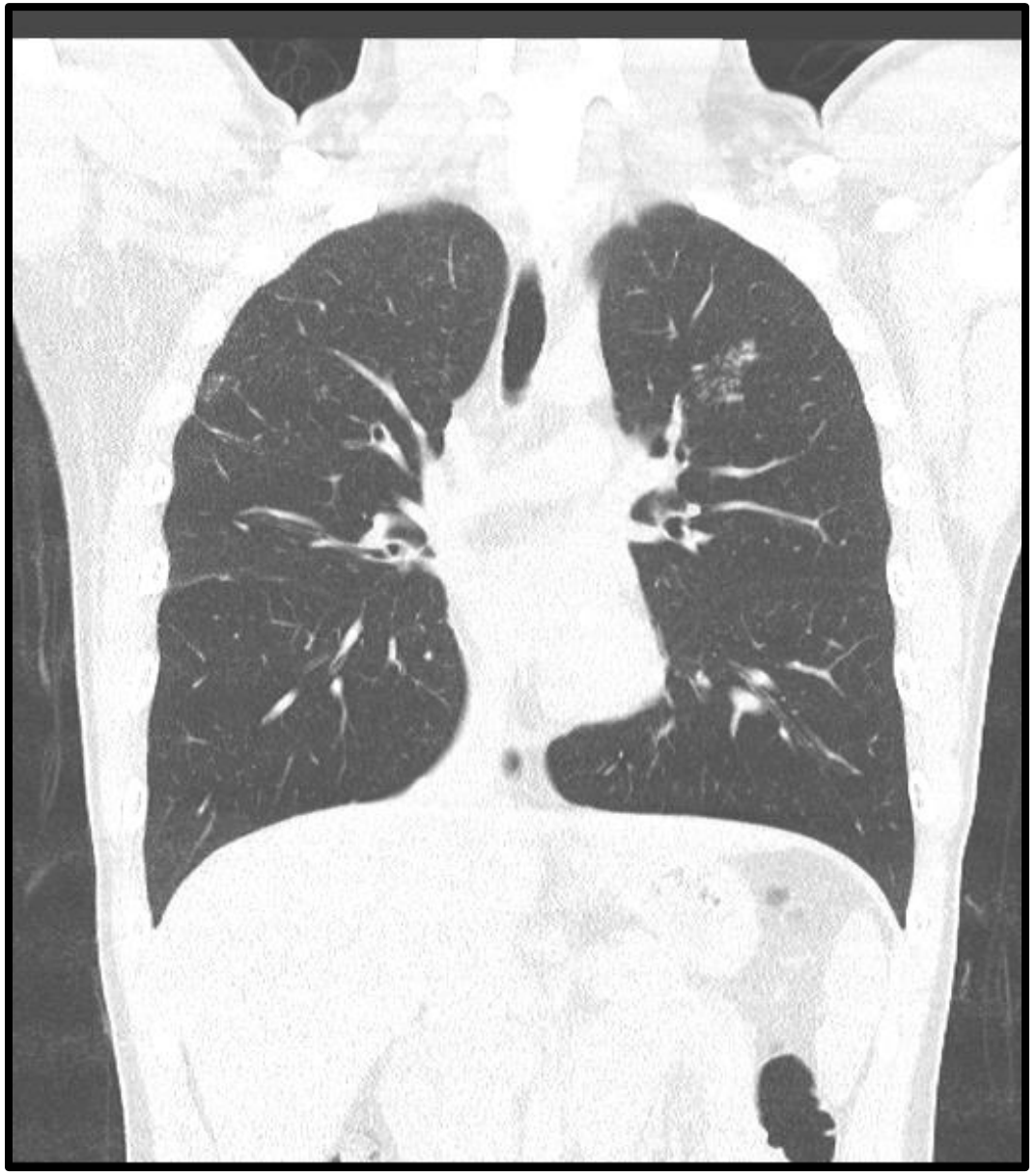
4 years ago



Present



Initial Chest CT



Case 1: 24/M

- Sputum AFB smear (-)/Xpert MTB/RIF assay (-)
- Bronchial aspirate AFB smear (-)/Xpert MTB/RIF assay (-)
- Blood IGRA (+)

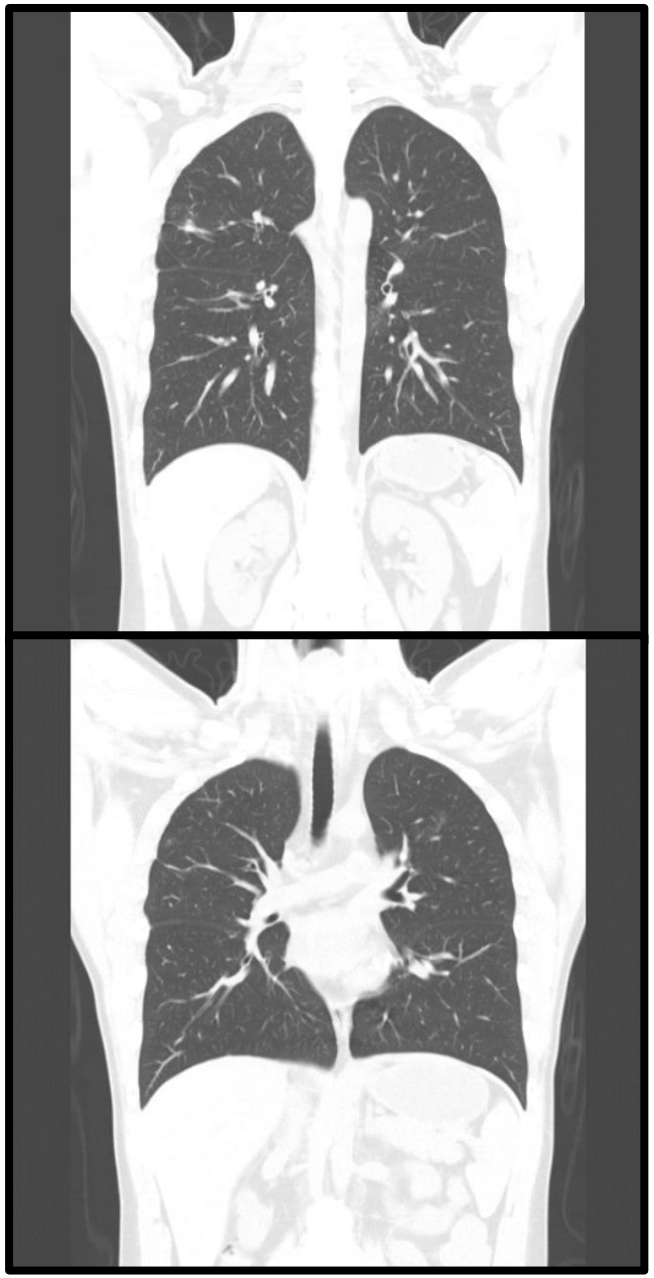
Q: what action should be taken next ?

1. Initiate anti-tuberculosis treatment (HRZE)
2. Initiate TB preventive therapy (R or HR or H)
3. Wait for the culture results
4. None of the above

Vote 1

Initial Dx

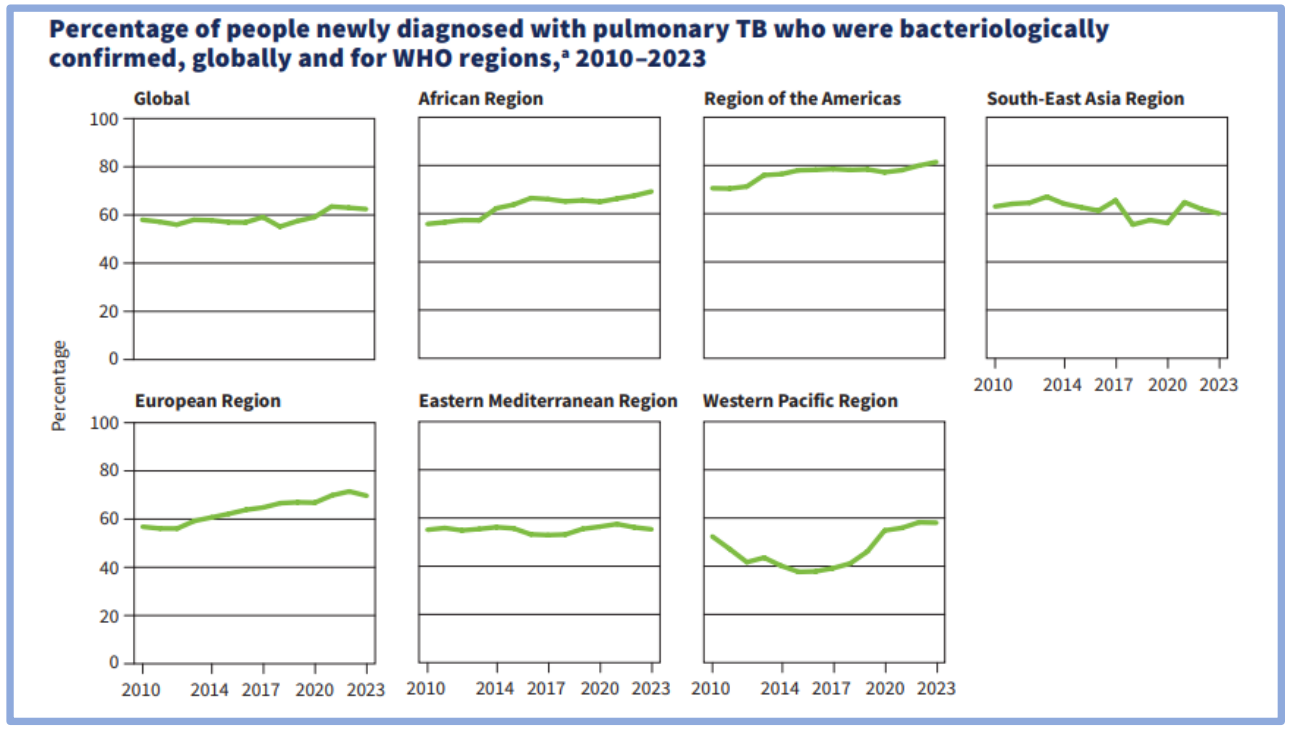
At 2nd mo of anti-TB Tx



Sputum & BA

- MTB culture (-)

Proportion of culture-negative pulmonary TB



Global tuberculosis report 2024

Min et al. BMC Pulm Med (2020) 20:316
https://doi.org/10.1186/s12890-020-01351-z

BMC Pulmonary Medicine

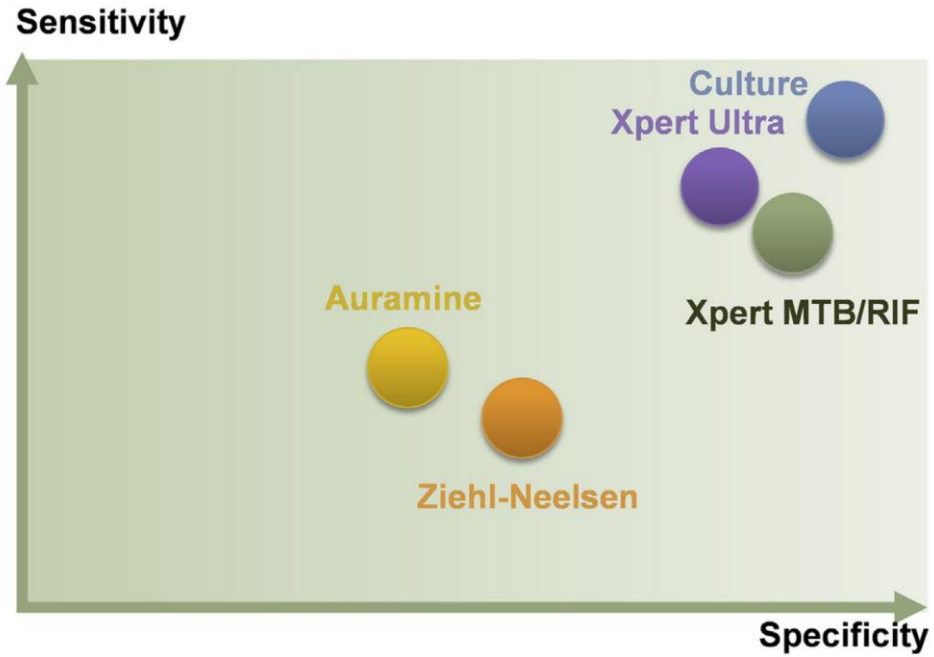
RESEARCH ARTICLE Open Access

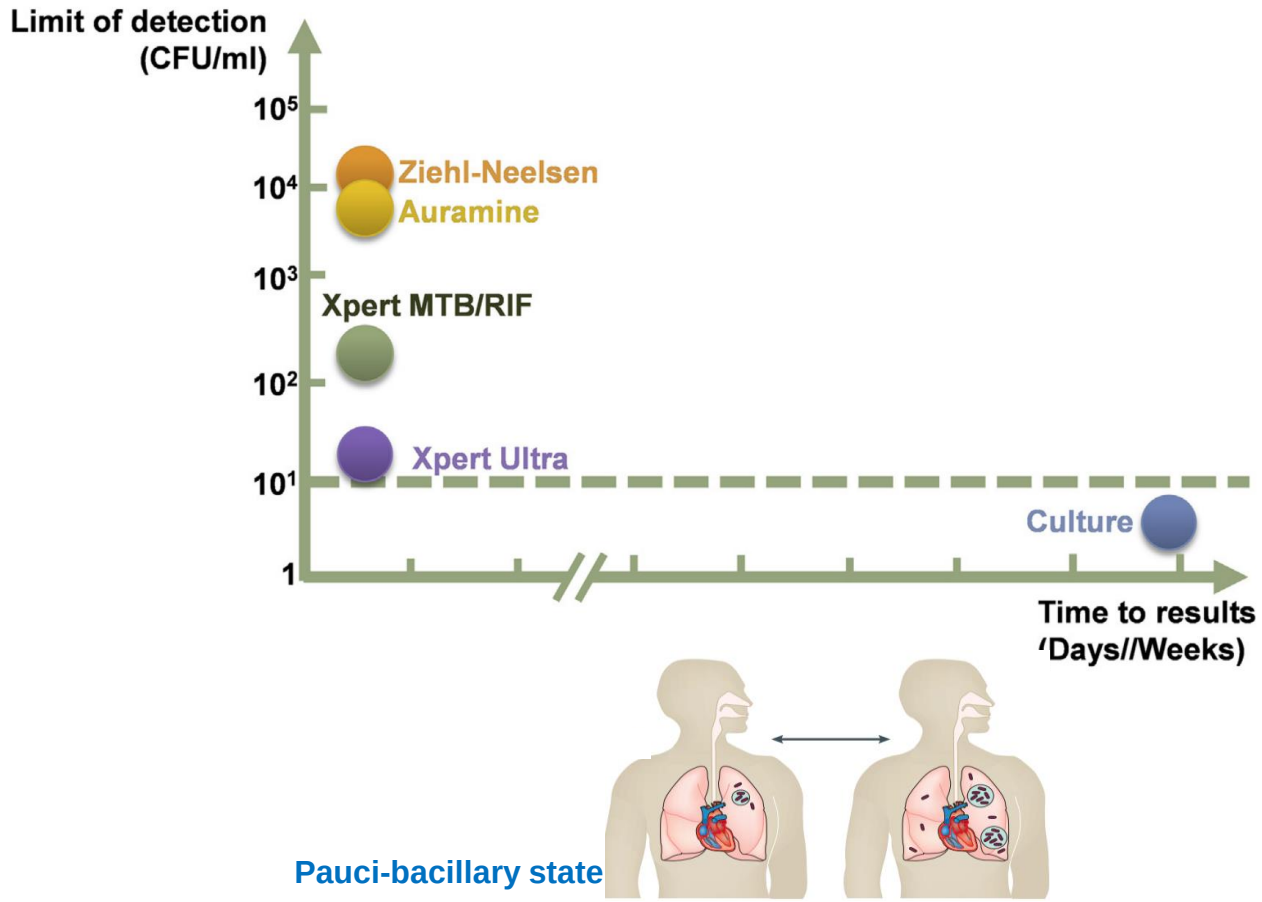
Clinical profiles of subclinical disease among pulmonary tuberculosis patients: a prospective cohort study in South Korea

Jinsoo Min[1], Chaeuk Chung[2], Sung Soo Jung[2], Hye Kyeong Park[3], Sung-Soon Lee[3] and Ki Man Lee[4,5*]

31% (95% CI, 26.9-35.8%)

Diagnostic performance of microbial tests for TB





Opota et al. Clinical Microbiology and Infection 2019

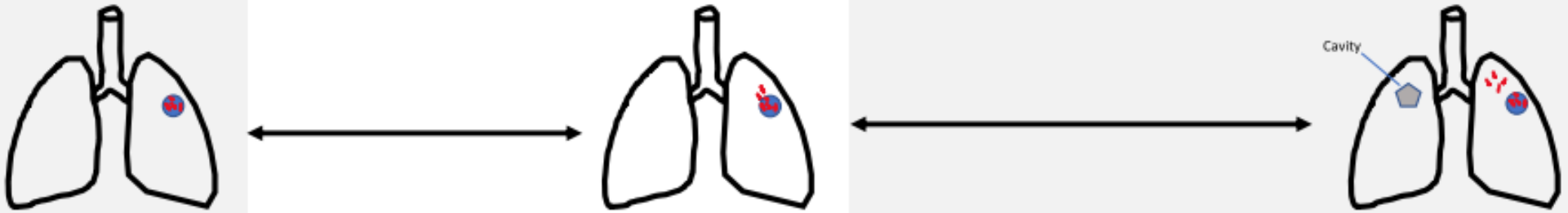
Solanki et al. Expert Review of Molecular Diagnostics 2024

Current diagnostic and treatment approaches across the spectrum

Asymptomatic TB (bacteriologically unconfirmed)

Clinically diagnosed TB

TB Spectrum

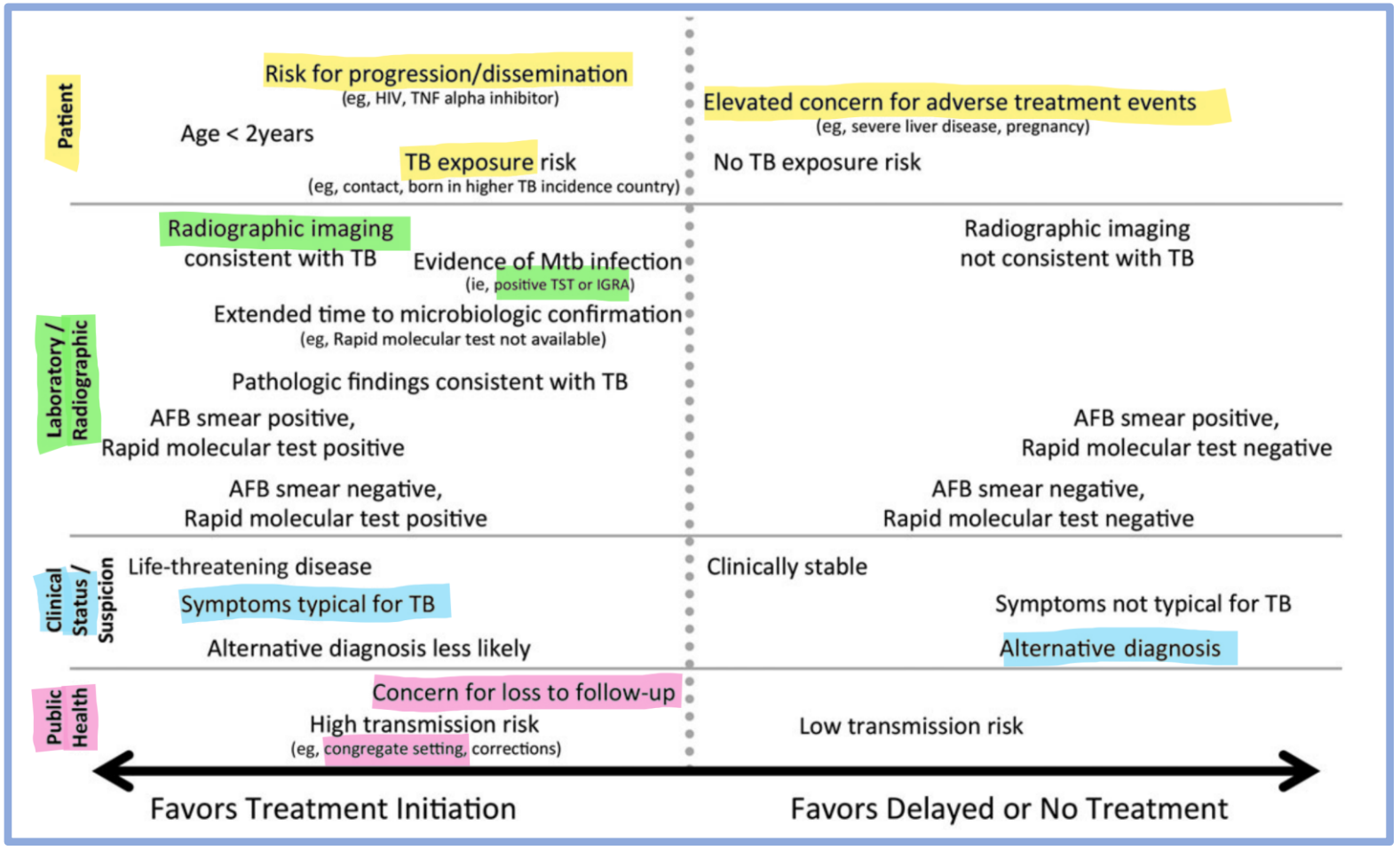


LTBI | **Subclinical TB disease** | **Active TB disease**

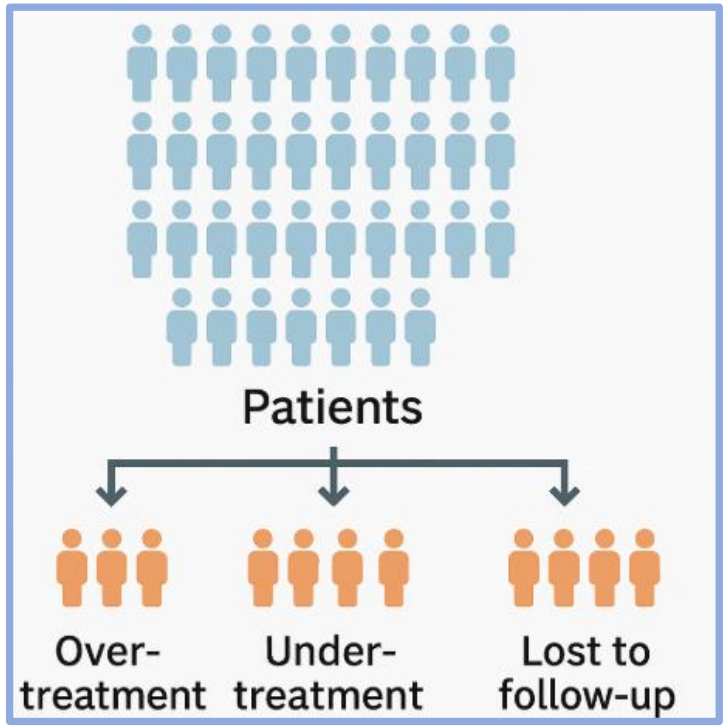
Clinical	Asymptomatic *"Immune sensitized to Mtb" or "latent infection"*	Asymptomatic *"Subclinical, bacteriologically negative" or "incipient disease"*	Asymptomatic *"Subclinical, bacteriologically positive disease"*	Symptomatic *"Clinical bacteriologically negative disease"*	Symptomatic *"Clinical bacteriologically positive disease"*	Symptomatic *"Clinical smear positive/extensive disease"*
Smear	-	-	-/+	-	-	+
Culture	-	-	+	-	+	+
Molecular (Xpert)	-	-	-/+	-	+	+
CXR (Pulmonary TB)	Normal	Minimal abnormalities		Minimal abnormalities		Extensive abnormalities/ cavities
Identification	LTBI screening	Active Case Finding			Passive Case Finding	
Current management approach	1HP, 3HP (weekly), 3HR, 4R, 6H, 9H	Observation or 2HRZ(E)/4HR	2HRZ(E)/4HR	2HRZ(E)/4HR	2HRZ(E)/4HR	2HRZE/4HR

Esmail et al. eBioMedicine 2022

Factors to be considered in deciding to initiate empirical TB Tx prior to microbiologic confirmation



Nahid et al. ATS/CDC/IDSA 2016



Esmail et al. eBioMedicine 2022

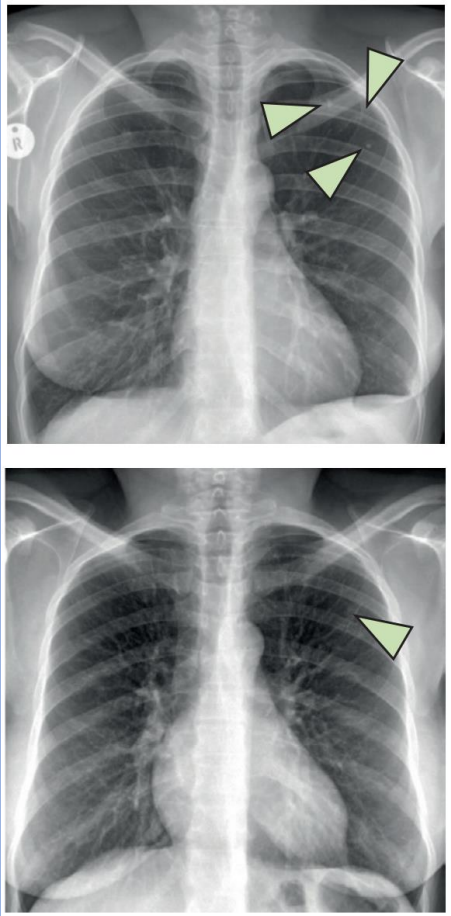
The natural history of untreated pulmonary tuberculosis in adults: a systematic review and meta-analysis

Bianca Sossen, Alexandra S Richards*, Torben Heinsohn, Beatrice Frascella, Federica Balzarini, Aurea Oradini-Alacreu, Anna Odone, Ewelina Rogozinska, Brit Häcker, Frank Cobelens, Katharina Kranzer, Rein M G J Houben†, Hanif Esmail†*

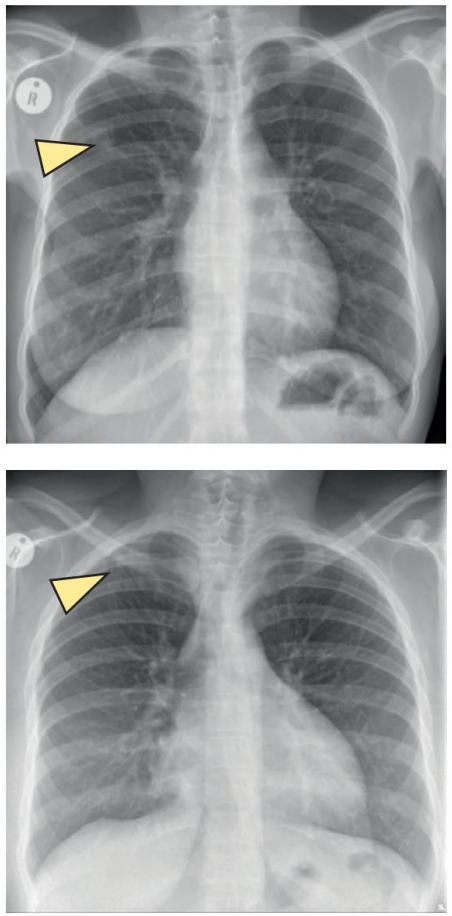
Stages of tuberculosis disease can be delineated by radiology, microbiology, and symptoms, but transitions between *Lancet Respir Med* 2023;

Inactive tuberculosis
Discrete fibrotic scar or linear opacity Discrete linear or reticular opacity within the lung with or without volume loss
Discrete non-calcified nodule(s) One or more nodular opacities with distinct borders and no airspace consolidation
Other findings suggestive of previous tuberculosis eg, upper lobe bronchiectasis

Inactive tuberculosis



Active tuberculosis: culture negative



Active tuberculosis
Infiltrate or consolidation Opacification of airspaces within the lung parenchyma
Cavitary lesion Lucency within the lung parenchyma that might be surrounded by airspace consolidation
Nodule with poorly defined margins Round opacity within the lung parenchyma
Pleural effusion Presence of fluid within the pleural space
Hilar or mediastinal lymphadenopathy Enlargement of lymph nodes within the hila, mediastinum, or both
Miliary nodules Nodules measuring 1–2 mm in size distributed throughout the lung parenchyma

Transition rates from bacteriologically negative to positive disease

	Patients who progressed (n)	Cohort size (n)	Follow-up (months)	Annualised rate (95% CI)
Active				
Frimodt-Moller et al (1965)[33]	25	86	36	0·10 (0·04–0·17)
Okada et al (2012)[52]	51	309	24	0·09 (0·06–0·12)
Cowie et al (1985)[31]	88	152	58	0·16 (0·11–0·22)
Nørregaard et al (1990)[51]	8	28	48	0·07 (0·00–0·17)
Borgen et al (1950, 1951)[28,29]	2	24	30	0·04 (0·00–0·12)
Aneja et al (1979)[24]	21	110	12	0·19 (0·12–0·26)
National Tuberculosis Institute (1974, 1976, 1978, 1982)[42–50]	36	271	60	0·03 (0·01–0·05)
Beeuwkes et al (1942)[25]	13	43	33	0·12 (0·02–0·21)
Hong Kong Chest Service (1979, 1981, 1984)[34–37]	71	176	60	0·10 (0·05–0·14)
Random-effects model				**0·10 (0·06–0·13)**
Heterogeneity: Q=40·8, df=8 (p<0·0001); I^2=77·4%, τ^2=0·0020				
Inactive				
Alling et al (1955)[22]	10	58	156	0·02 (0·00–0·05)
Lincoln et al (1954)[39]	36	314	72	0·02 (0·00–0·03)
Sikand et al (1959)[56]	5	167	12	0·03 (0·00–0·06)
IUAT Committee on Prophylaxis (1982)[38]	97	6990	60	0·00 (0·00–0·00)
Anastasatu et al (1985)[23]	6	143	24	0·02 (0·00–0·04)
Puffer et al (1945)[55]	10	267	62	0·01 (0·00–0·02)
Borgen et al (1950, 1951)[28,29]	2	120	30	0·01 (0·00–0·02)
Random-effects model				**0·01 (0·00–0·02)**
Heterogeneity: Q=12·6, df=6 (p=0·051); I^2=53·2%, τ^2<0·0001				

Sossen et al. Lancet Respir Med 2023

The same treatment approach for culture-positive & culture-negative pulmonary TB?

2. 감수성결핵의 치료

권고요약

· 감수성결핵 치료의 표준처방은 2HRZE/4HR이다. 약제감수성검사 결과 이소니아지드 및 리팜핀에 감수성 결핵으로 확인된 경우에는 에탐부톨을 중단할 수 있다(IIB).

· 감수성결핵 환자에서 치료 시작 시 흉부X선에서 공동이 있고, 치료 2개월 후 시행한 객담 배양이 양성인 경우에는 유지 치료 기간의 연장을 고려할 수 있다(IIB).

Clinical Trial > Br J Dis Chest. 1984 Oct;78(4):330-6.

A controlled trial of 6 months' chemotherapy in pulmonary tuberculosis. Final report: results during the 36 months after the end of chemotherapy and beyond. British Thoracic Society

Inclusion criteria: **sputum AFB smear (+)**

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 10, 2022 VOL. 386 NO. 10

Shorter Treatment for Nonsevere Tuberculosis in African and Indian Children

A. Turkova, G.H. Wills, E. Wobudeya, C. Chabala, M. Palmer, A. Kinikar, S. Hissar, L. Choo, P. Musoke, V. Mulenga, V. Mave, B. Joseph, K. LeBeau, M.J. Thomason, R.B. Mboizi, M. Kapasa, M.M. van der Zalm, P. Raichur, P.K. Bhavani, H. McIlleron, A.-M. Demers, R. Aarnoutse, J. Love-Koh, J.A. Seddon, S.B. Welch, S.M. Graham, A.C. Hesseling, D.M. Gibb, and A.M. Crook, for the SHINE Trial Team*

있다. 세균학적 검사와 흉부X선 검사가 시행된 소아청소년 환자에서 다음 조건을 모두 만족하는 약제 감수성 결핵의 경우 2HRZ(E)/2HR 단축 치료요법을 적용할 수 있음을 제시하였다.

- 3개월 이상 16세 미만 소아청소년
- 흉부X선에서 비중증 결핵 소견 : 기도 폐쇄가 없는 흉곽내 림프절 결핵, 공동이 없고 좁쌀 결핵 형태가 아닌 한쪽 폐엽에 국한된 결핵, 또는 단순 결핵성 흉수
- 객담 도말검사 음성 또는 Xpert MTB/RIF 검사 음성/미량(trace)
- 입원을 요하지 않는 경미한 증상

Korean guidelines for tuberculosis (5th edition), 2024

Treatment of culture-negative pulmonary TB

Clinical Infectious Diseases Advance Access published August 10, 2016

Clinical Infectious Diseases

IDSA GUIDELINE

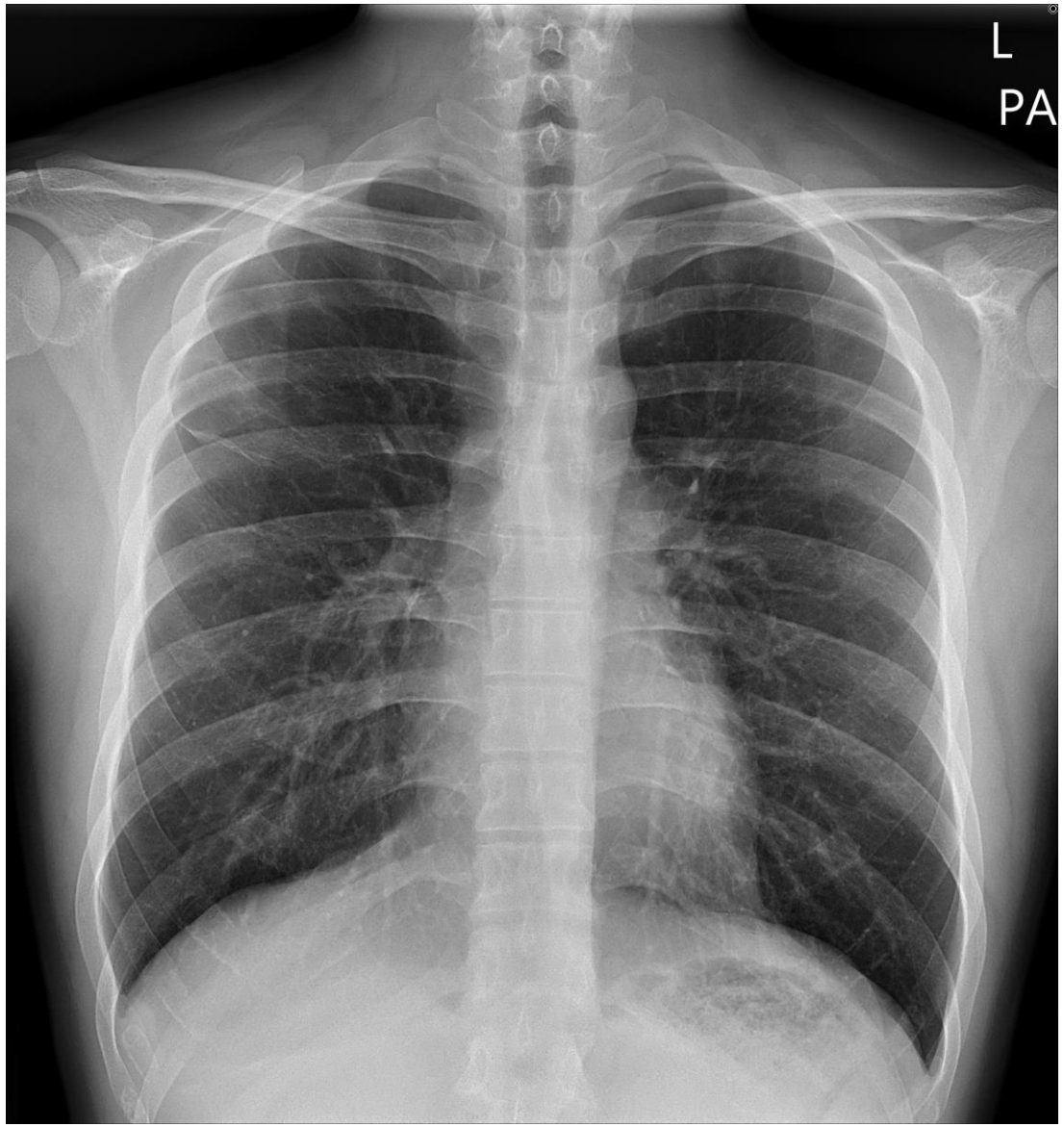
Official American Thoracic Society/Centers for Disease Control and Prevention/Infectious Diseases Society of America Clinical Practice Guidelines: Treatment of Drug-Susceptible Tuberculosis

Payam Nahid,[1] Susan E. Dorman,[2] Narges Alipanah,[1] Pennan M. Barry,[3] Jan L. Brozek,[4] Adithya Cattamanchi,[1] Lelia H. Chaisson,[1] Richard E. Chaisson,[2] Charles L. Daley,[5] Malgosia Grzemska,[6] Julie M. Higashi,[7] Christine S. Ho,[8] Philip C. Hopewell,[1] Sal
Richard Menzies,[10] Cynthia Merrifield,[1] Masahiro Narita,[12] Rick O'Brien,[13] Charles A. Peloquin,[14] An
Giovanni Sotgiu,[17] Jeffrey R. Starke,[18] Giovanni Battista Migliori,[11] and Andrew Vernon[8]

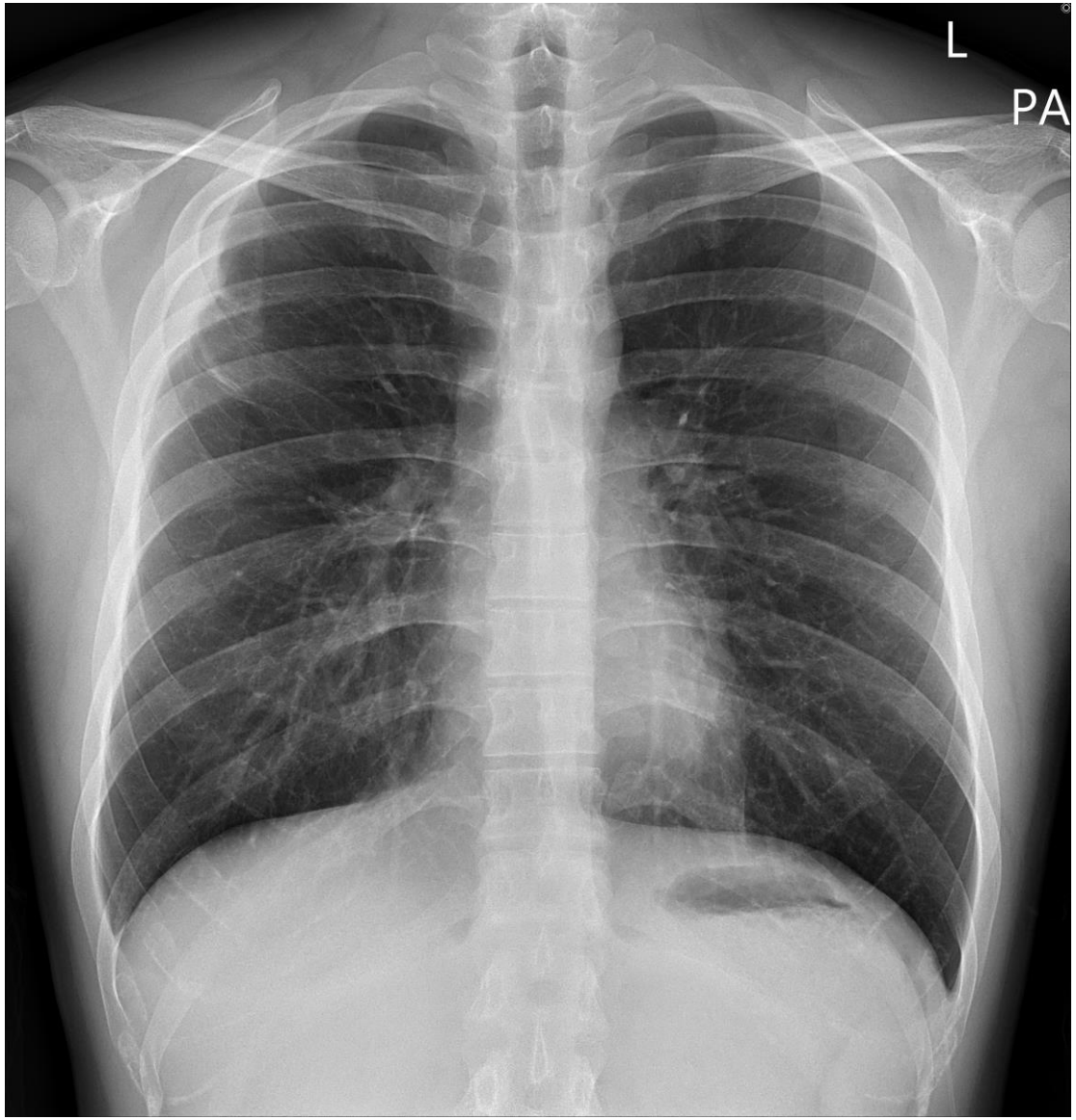
Recommendation 9: We suggest that a 4-month treatment regimen is adequate for treatment of HIV-uninfected adult patients with AFB smear- and culture-negative pulmonary tuberculosis *(conditional recommendation; very low certainty in the evidence)*.

Hope for the development of a shorter, less toxic treatment regimen

At 2nd mo of anti-TB Tx



At 4th mo of anti-TB Tx



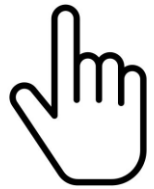
At 4th mo of anti-TB Tx

- Pleuritic chest pain, mild
- Sputum
  - AFB smear (-)
  - Xpert MTB/RIF assay (-)

Q: what action should be taken next ?

1. Keep anti-tuberculosis treatment (HRE)
2. Keep anti-TB treatment & add corticosteroids
3. Perform a biopsy
4. None of the above

Vote 2

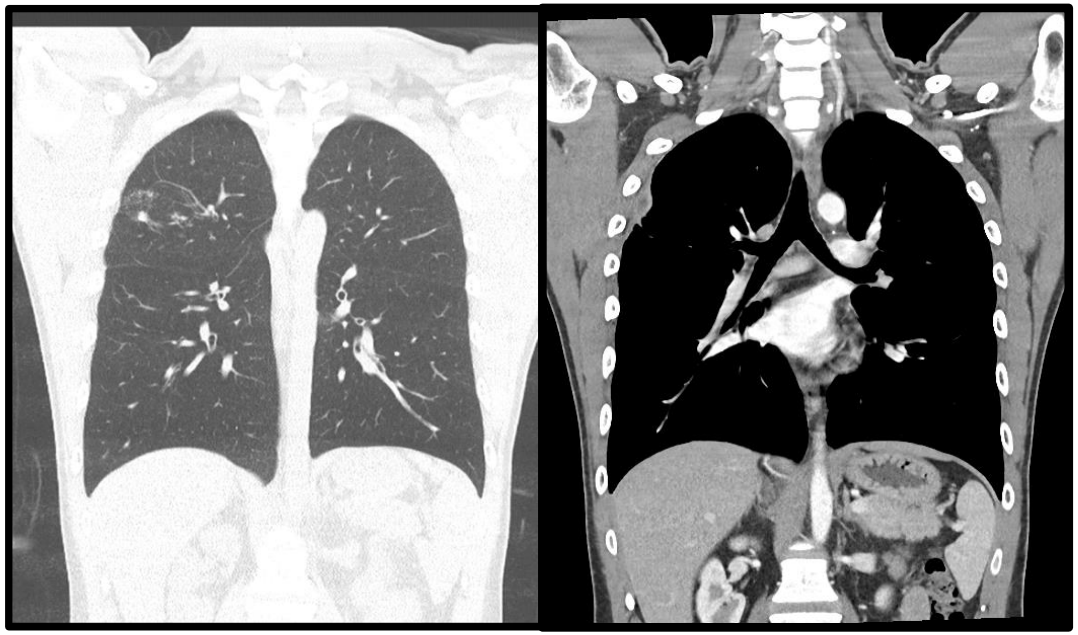


Differential diagnosis

- Incorrect initial diagnosis (NTM, pneumonia, nonspecific bronchiolitis etc.)?
- DR-TB?
- Non-compliance to TB drugs?

Initial

At 4th mo of anti-TB Tx



- New disease other than TB?

TB- paradoxical response
(TB-immune reconstitution inflammatory syndrome)

- Worsening of **pre-existing TB lesions** or development of **new lesions** after effective anti-TB treatment

- Criteria

    1) **initial response** to anti-tuberculosis treatments

    2) paradoxical **deterioration** of TB-related symptoms and/or radiological findings

    3) **exclusion of alternative explanations** for clinical deterioration such as **drug resistance, poor adherence, drug side effects and other infections**

Lanzafame et al. J clinical tuberculosis & other mycobacterial diseases 2016

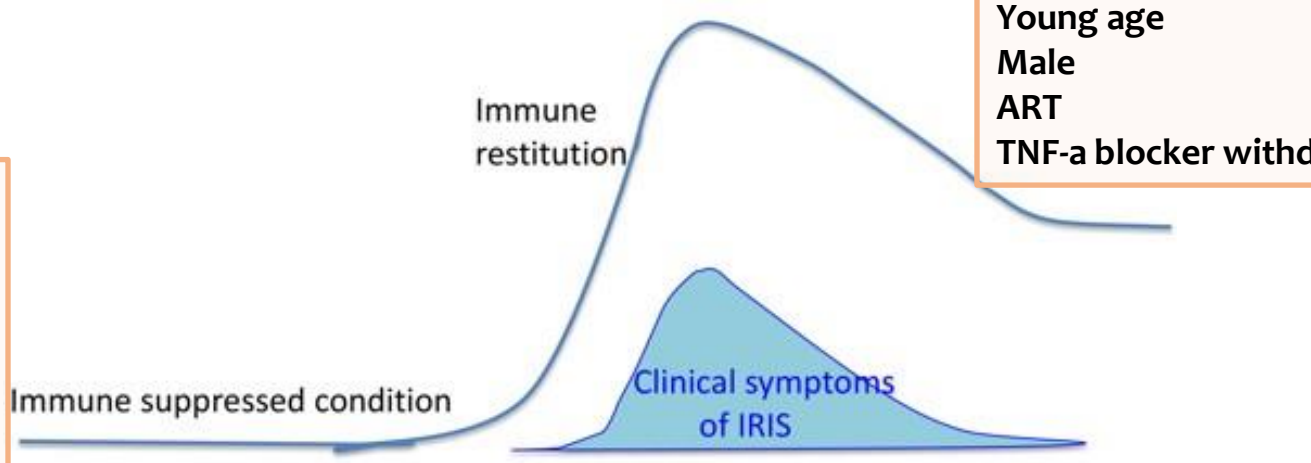
TB-Immune reconstitution inflammatory syndrome

HIV

Disseminated or extrapulmonary TB

Genetic susceptibility

Biologic agent use



Young age
Male
ART
TNF-a blocker withdrawal

HIV (+)	TB + ART	TB worsening
	ART	TB unmasking
HIV (-)	TB	TB worsening

Sueki et al. J Dermatology 2018

Diagnosis and treatment of TB-IRIS

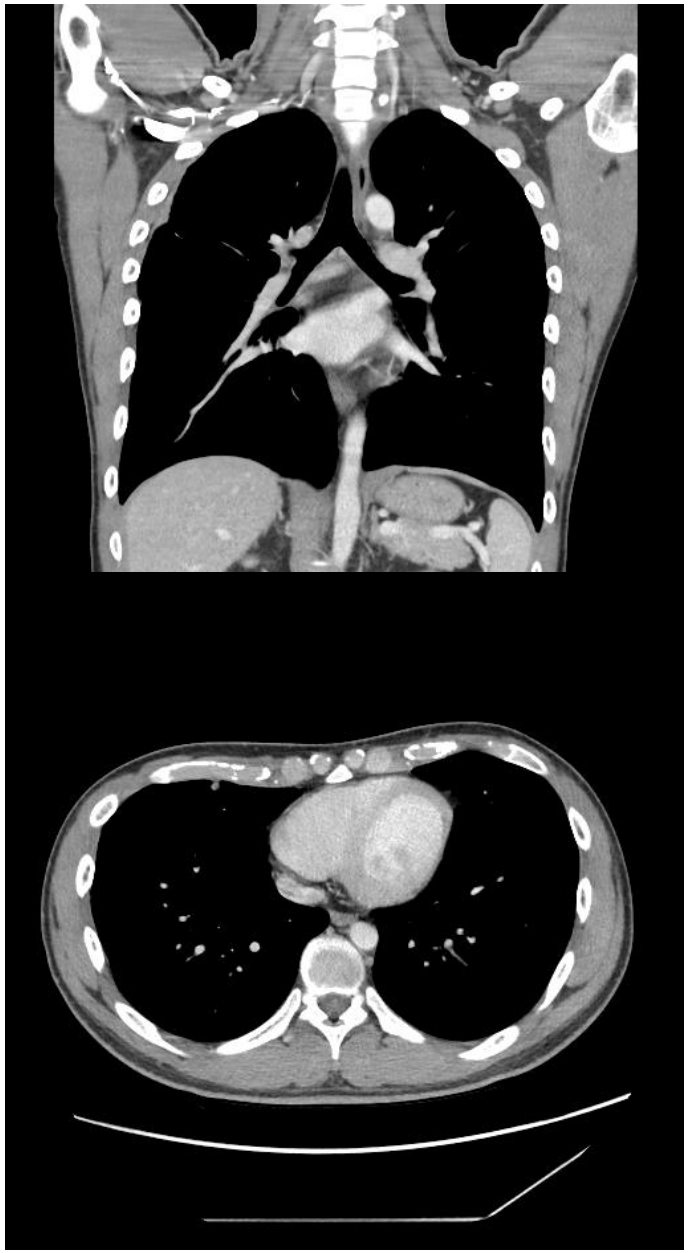
- Exclusive diagnosis
  - CT/PET-CT or Bx (malignancy)
  - Microbiologic test (bacteria, fungus, **DR-TB**)
- No standard treatment
  - Clinical improvement of most patients in 2-3 mo following anti-TB treatment
  - Corticosteroids (symptomatic enlarging intracranial tuberculoma, endobronchial obstruction)

Meintjes et al. Clinical Infectious Disease 2009

Lanzafame et al. J clinical tuberculosis & other mycobacterial diseases 2016

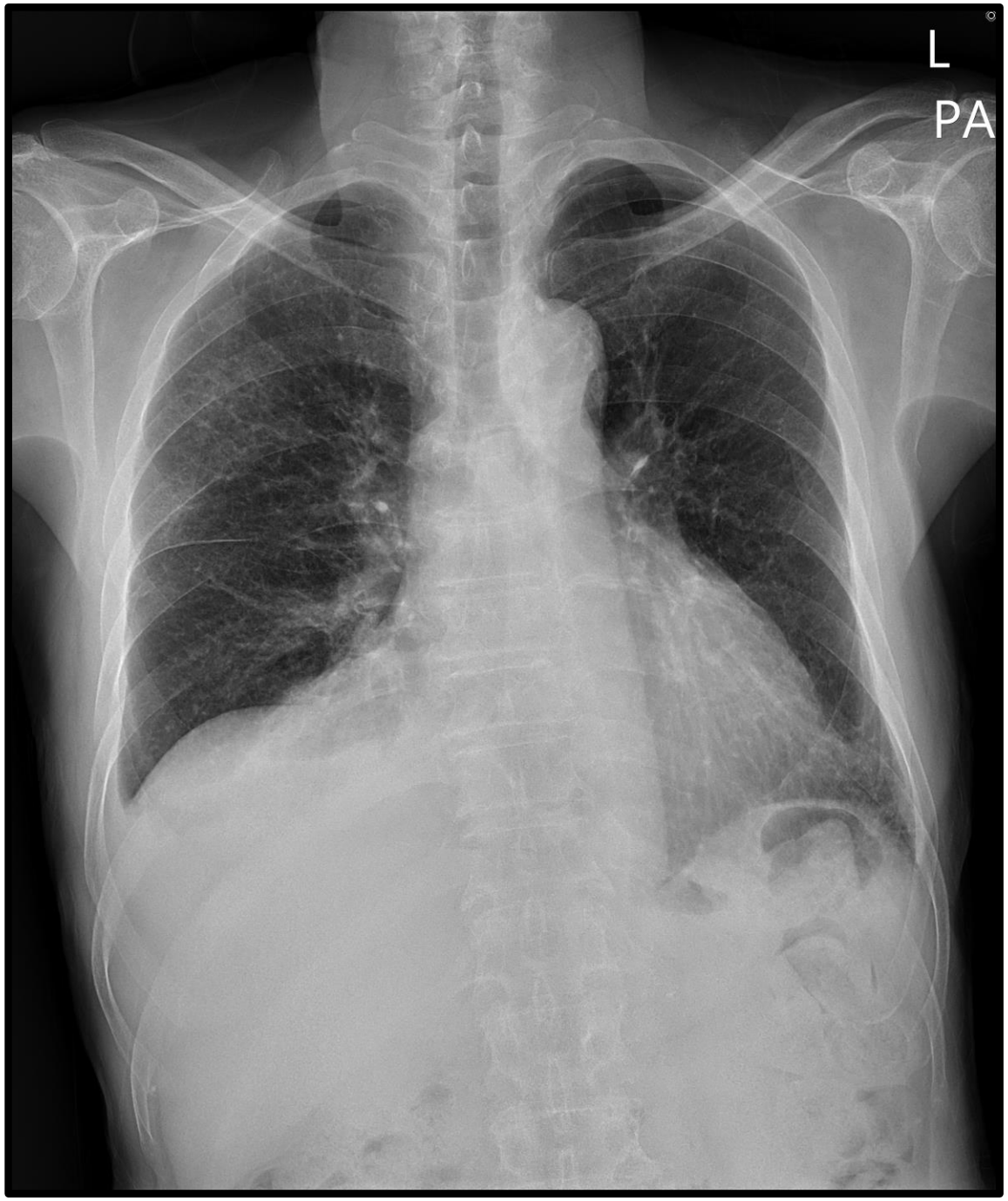
At 4th mo of anti-TB Tx

At 6th mo of anti-TB Tx

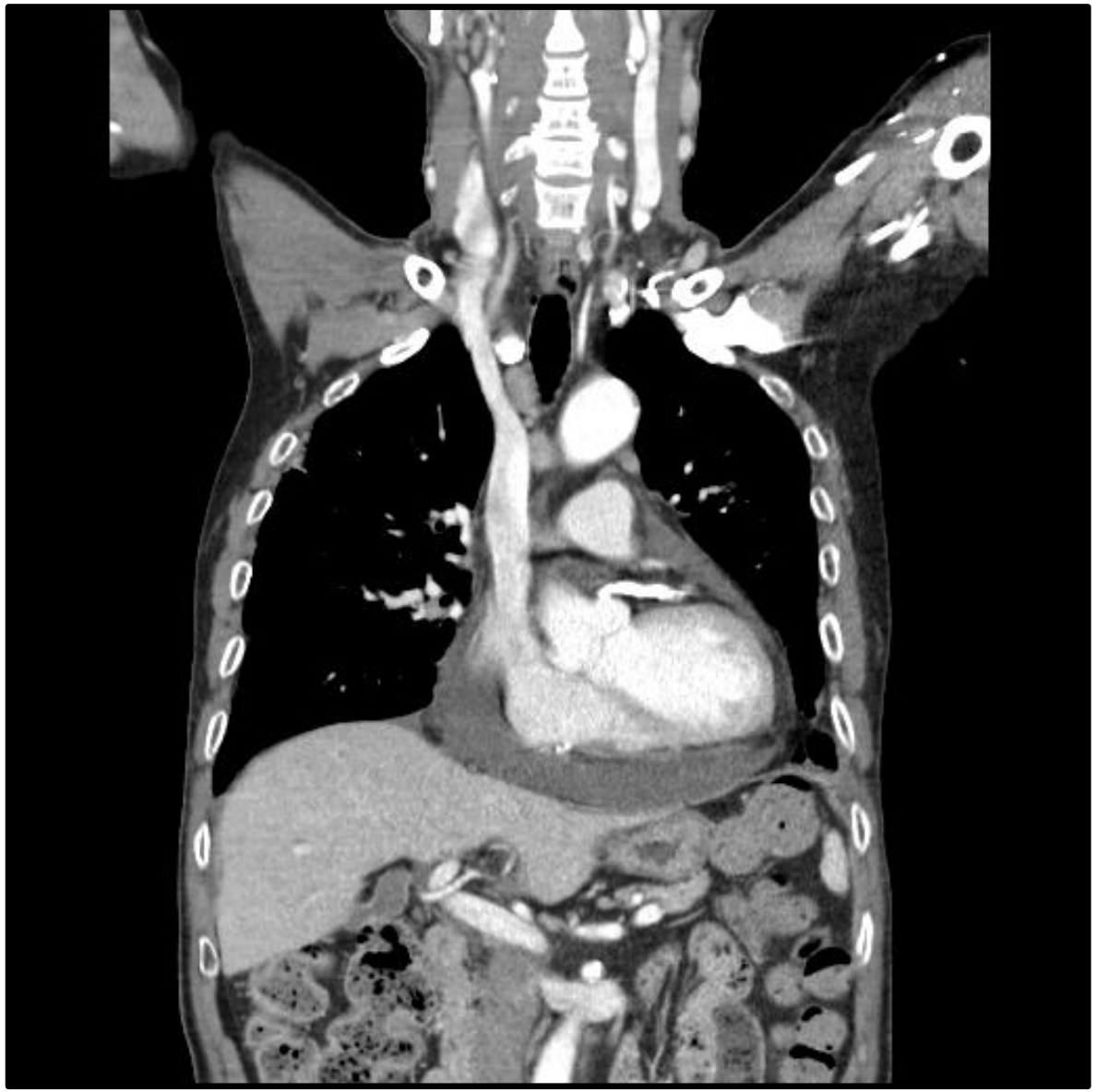


Case 2: 80/M

- DOE for 4 mo
- Mucoid sputum, scant
- DM/Parkinson’s disease (+/+)
- Ex-smoker (quit 15y ago, 40PYs)



Initial Chest CT



Case 2: 80/M

- Diagnostic thoracentesis
  - Straw color fluid
  - pH 7.46, **C/C 1,748 (MNL 99.4%)**
  - **Protein 5.9 g/dL**, LDH 174 U/L, Glc 125 mg/dL
  - **ADA 50 IU/L**
  - CEA 1.8 ng/mL
  - AFB smear (-)/Xpert MTB/RIF assay (-)

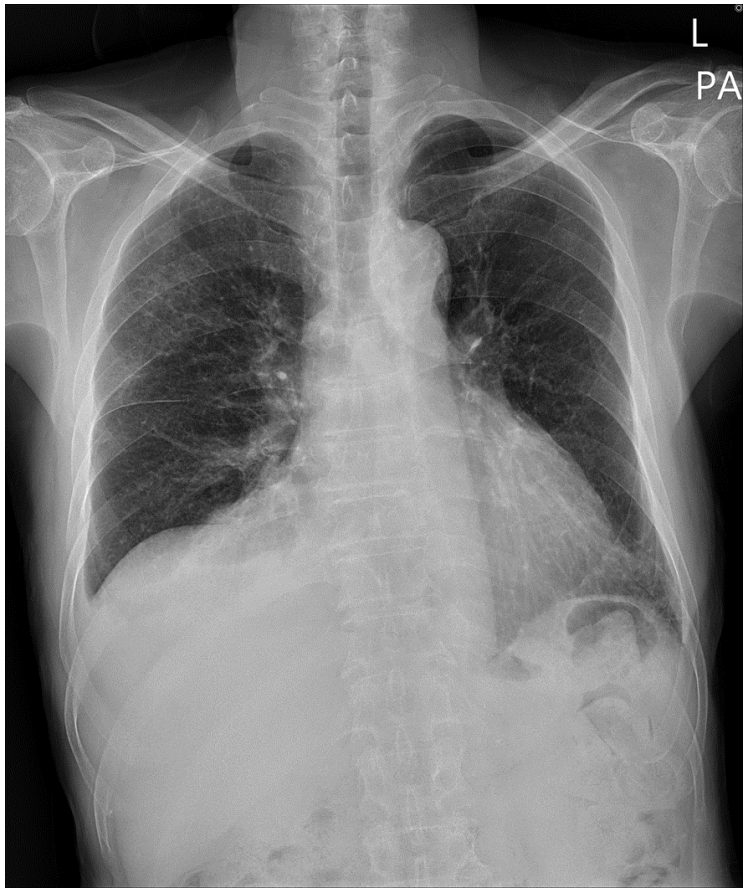
- Serum protein 7.4 g/dL, LDH 171 U/L
- Blood IGRA (-)
- ANA (-)/IgG4 2,606 mg/L (Ref, 30-2,010 mg/L)
- Sputum AFB smear (-)/Xpert MTB/RIF assay (-)

Q: what action should be taken next ?

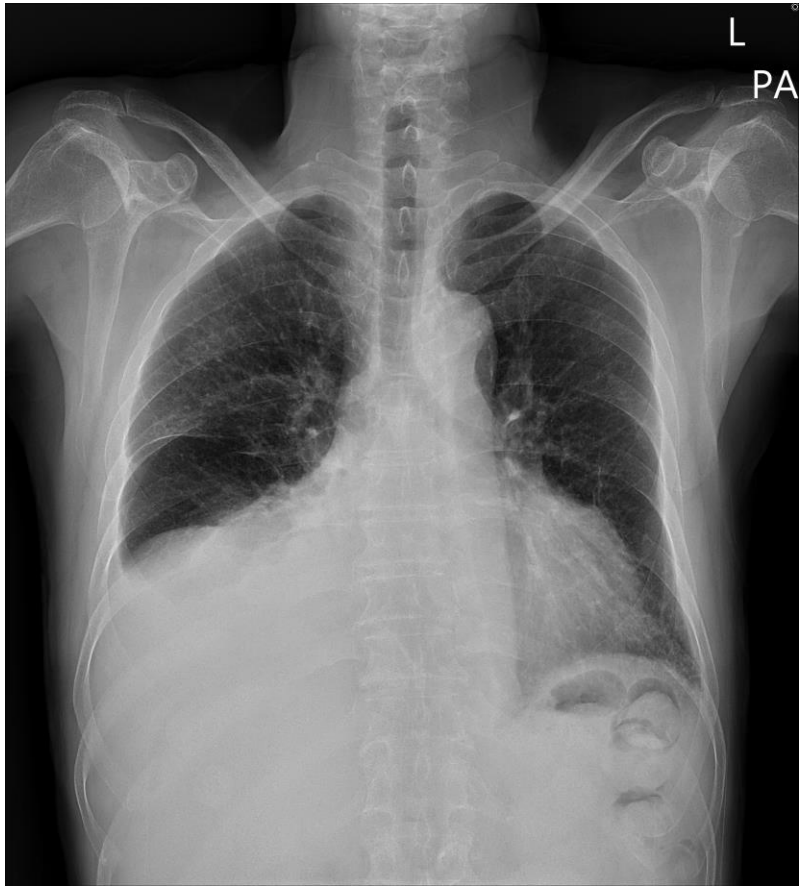
1. Initiate anti-tuberculosis treatment (HRZE)
2. Wait for the culture results
3. Perform a pleural biopsy
4. None of the above

Vote 3

Initial Dx



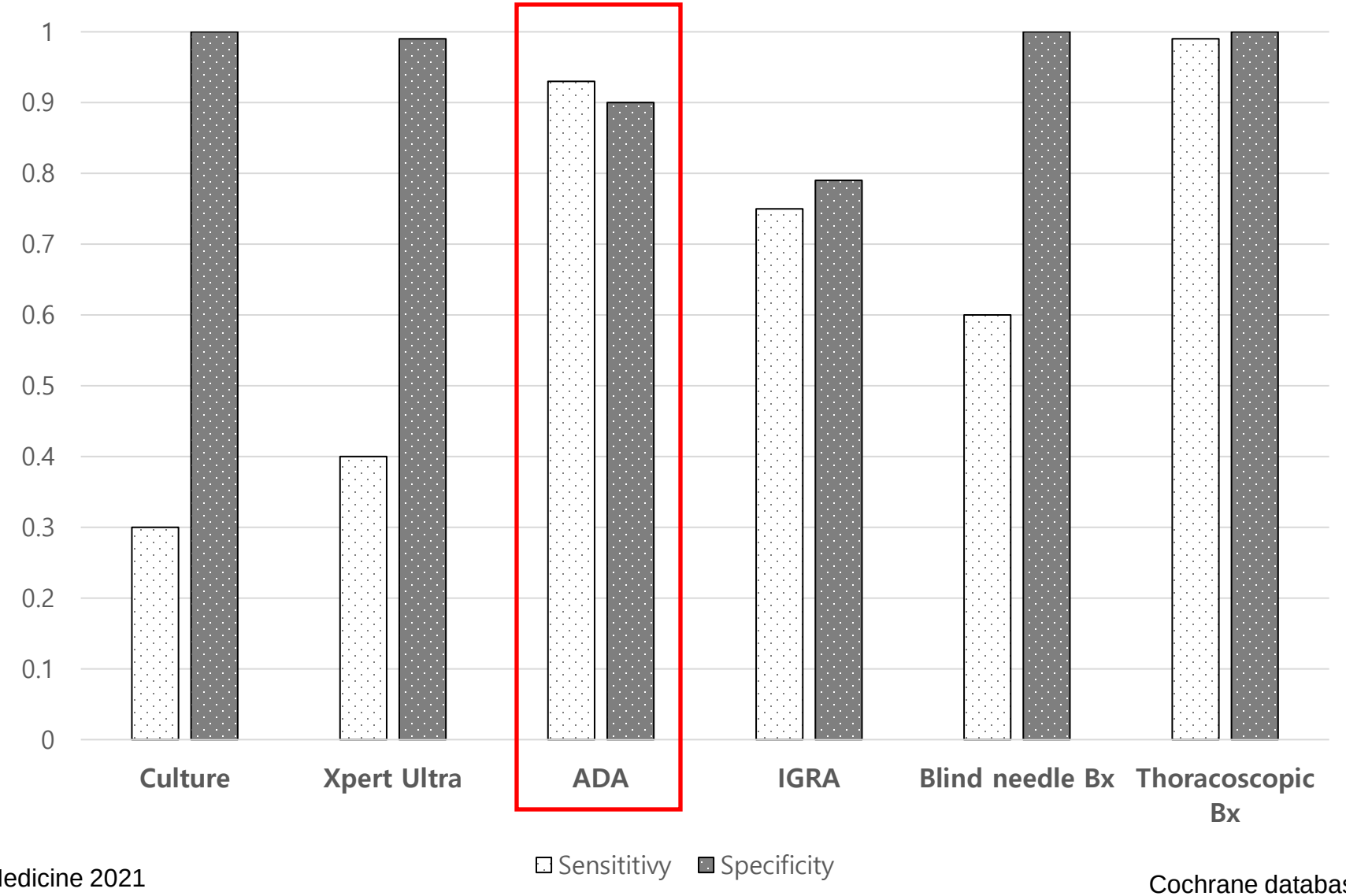
At 2nd mo of anti-TB Tx



Sputum & pleural fluid:

MTB culture (-)

Performance of diagnostic tests for TB pleural effusions



Cascio et al. Respiratory Medicine 2021

Cochrane database of systematic reviews 2021

Diagnosis of TB pleural effusions

권고요약

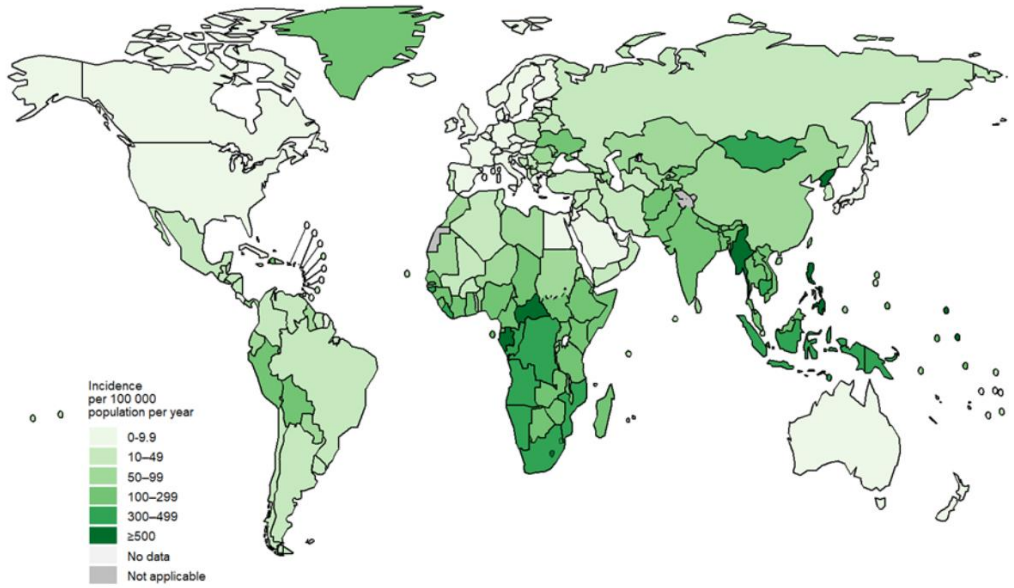
- 일측성 흉수를 동반한 모든 환자에서 결핵성 흉막염의 가능성을 의심해야 한다(IIIB).
- 결핵성 흉막염이 의심되는 환자에서도 적극적으로 객담 도말 및 배양검사를 시행해야 한다(IIA).
- 림프구가 우세 염증세포인 삼출성 흉수에서 흉수 adenosine deaminase (ADA) >40 IU/L이고, ADA가 증가할 수 있는 다른 동반 질환이 없다면 결핵성 흉수의 가능성이 크다(IIA).

PF ADA > 40IU/L
TB pleural effusion
Malignant pleural effusion
Parapneumonic effusion, Empyema
RA-pleural effusion
IgG4-related pleural effusion
Others

Korean guidelines for tuberculosis (5th edition), 2024

Diagnostic performance of pleural fluid adenosine deaminase: pretest probability

Fig. 1.1.3 Estimated TB incidence rates, 2023



High TB prevalence settings

Clinical suspicion of TB infection

Lymphocyte-dominant exudate with **ADA > 40 IU/L**

→ **PPV 98%** for diagnosing TPE

Low TB prevalence settings

No TB exposure history

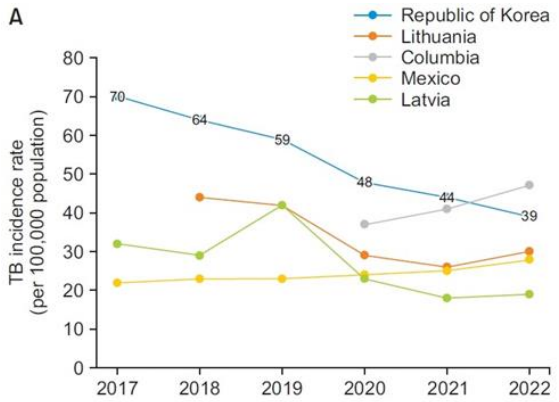
Lymphocyte-dominant exudate with **ADA < 30 (40) IU/L**

→ **NPV 98%** for ruling out TPE

WHO Global Tuberculosis Report 2024

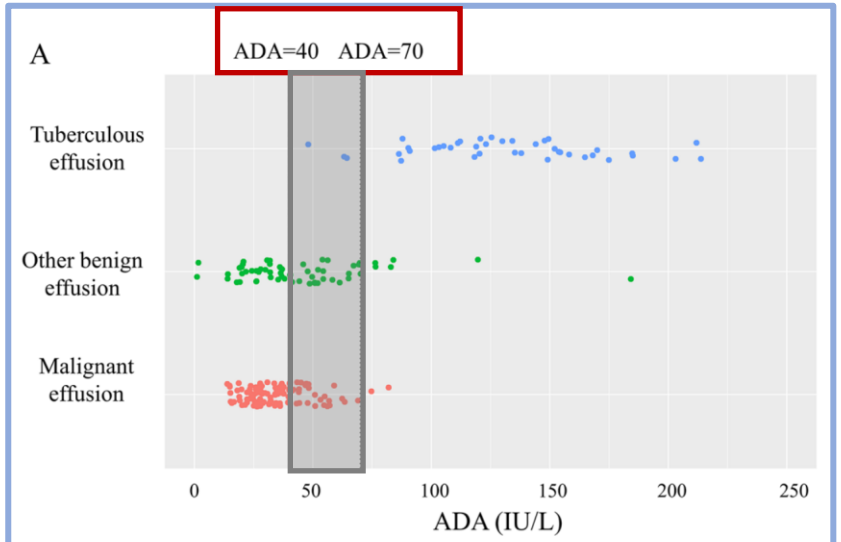
Shaw et al. Clin Respir J 2018

Role of ADA for diagnosis of TPE
- TB-epidemiologic status changes in South Korea



- Patients who underwent MT
- **2015-2020**
- TPE (n=52), MPE (n=156), Other benign effusion (n=84)

	TPE	Non-TPE	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Lymphocyte dominant pleural effusion[a]						
Current cutoff: 40 IU/L						
ADA ≥ 40	43	63	1.00 (0.92–1.00)	0.61 (0.53–0.69)	0.41 (0.31–0.51)	1.00 (0.96–1.00)
ADA < 40	0	100				
Raised cutoff: 70 IU/L						
ADA ≥ 70	40	12	0.93 (0.81–0.99)	0.93 (0.87–0.96)	0.77 (0.63–0.87)	0.98 (0.94–1.00)
ADA < 70	3	151				
Best cutoff: 84 IU/L						
ADA ≥ 84	40	5	0.93 (0.81–0.99)	0.97 (0.93–0.99)	0.89 (0.76–0.96)	0.98 (0.95–1.00)
ADA < 84	3	158				



	ADA level		
	<40	40-70	≥70
Tuberculous effusion	0 (0.0%)	3 (5.6%)	40 (76.9%)
Other benign effusion	31 (31.0%)	21 (38.9%)	10 (19.2%)
Malignant effusion	69 (69.0%)	30 (55.6%)	2 (3.8%)

Kim et al. Scientific Reports 2022

Min et al. Tuberc Respir Dis 2024

Case 2: 80/M

- Pleural biopsy (VATS)

  - Pleural tissue Xpert MTB/RIF assay (-)

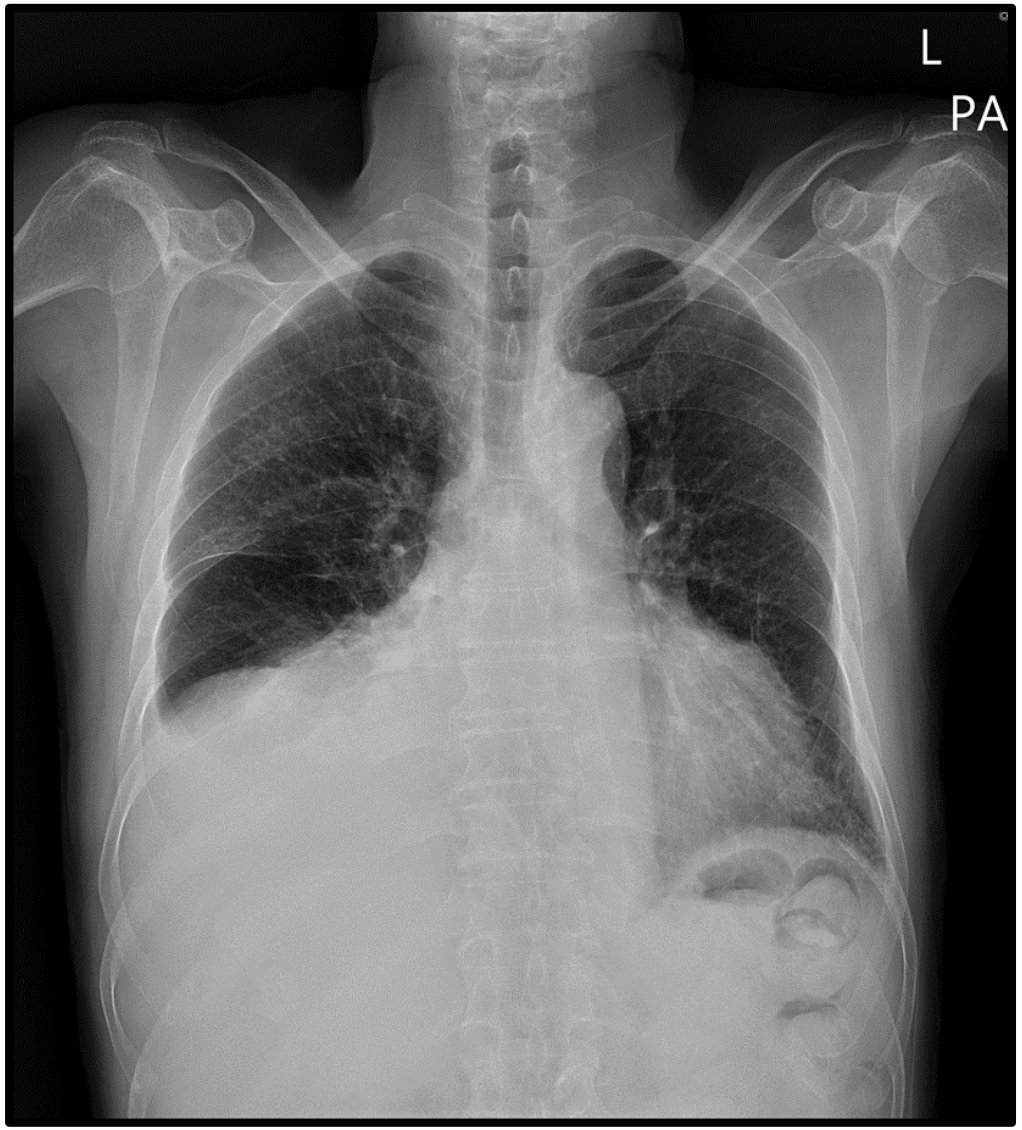
  - Pleural tissue AFB smear (-)

  - Histologic report: **chronic inflammation with a few IgG4-positive cells**

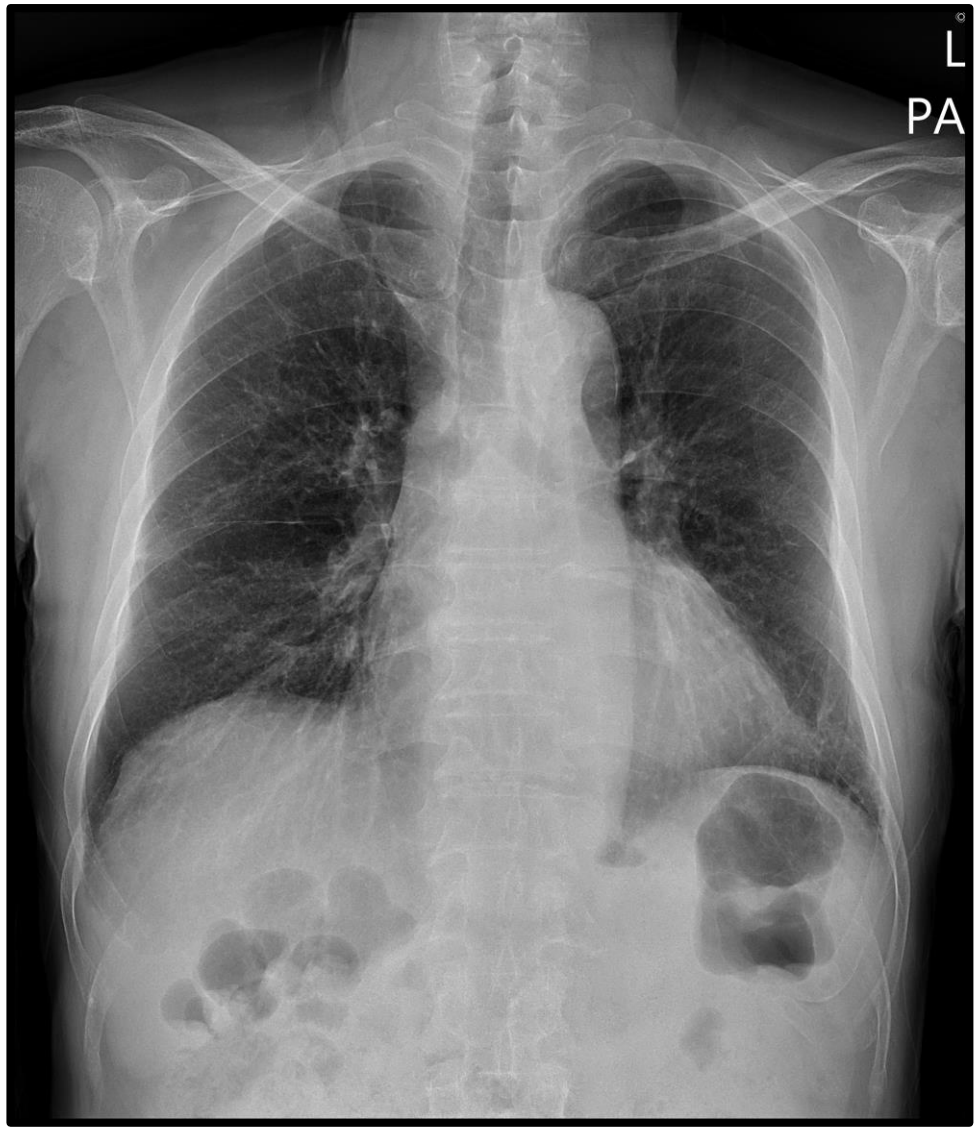
  - Pleural tissue MTB culture (-)

- **Serum IgG4 3,557 mg/L** (Ref, 30-2,010 mg/L)

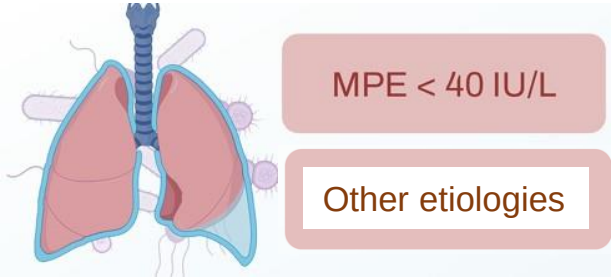
At 2nd mo of anti-TB Tx



After 2-mo of prednisolone Tx



Role of ADA for diagnosis of TPE
- TB-epidemiologic status changes in South Korea

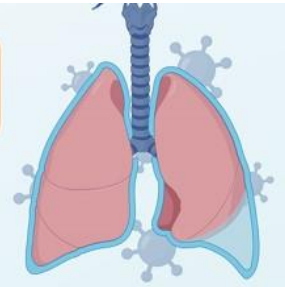


MPE < 40 IU/L

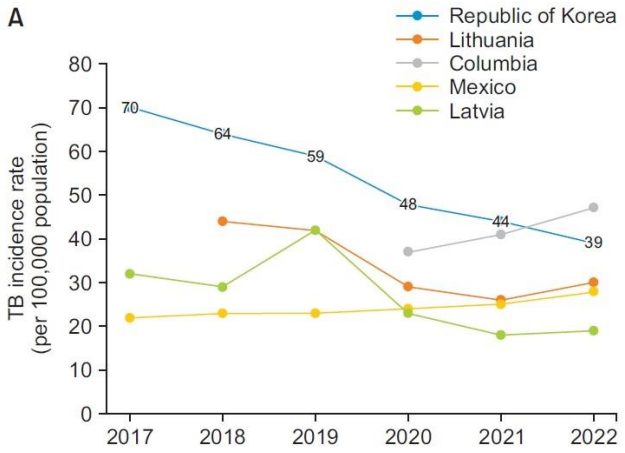
Other etiologies

Lymphocytic exudative pleural effusion
With ADA levels of 40 – 70 IU/L (gray zone)

70 IU/L < TPE



Further evaluation & differentiation with diseases other than TB



Min et al. Tuberc Respir Dis 2024

Lee et al. J Korean Med Sci 2025

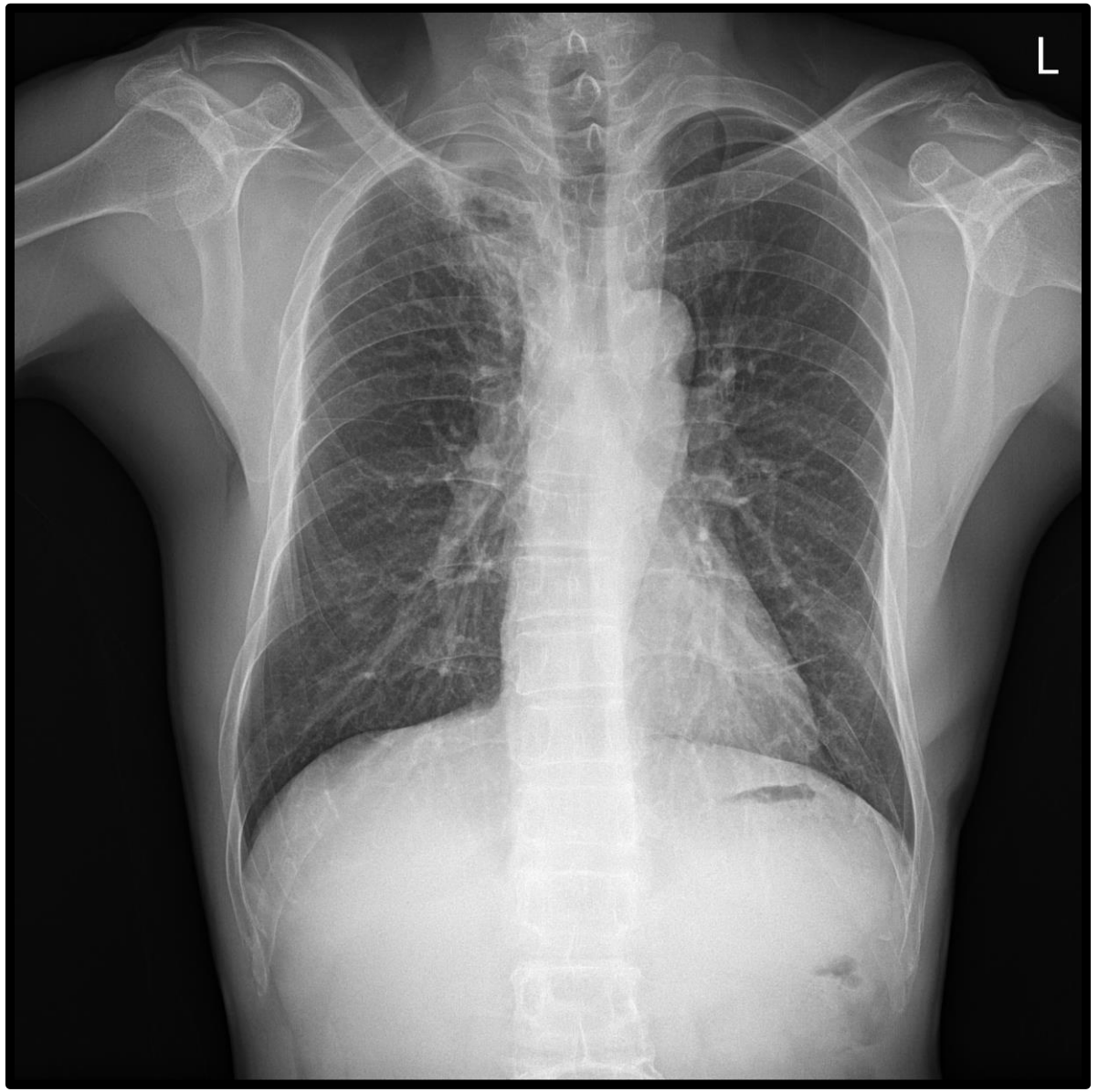
PF ADA > 40IU/L

- Malignant pleural effusion
- RA-pleural effusion
- IgG4-related pleural effusion
- Others

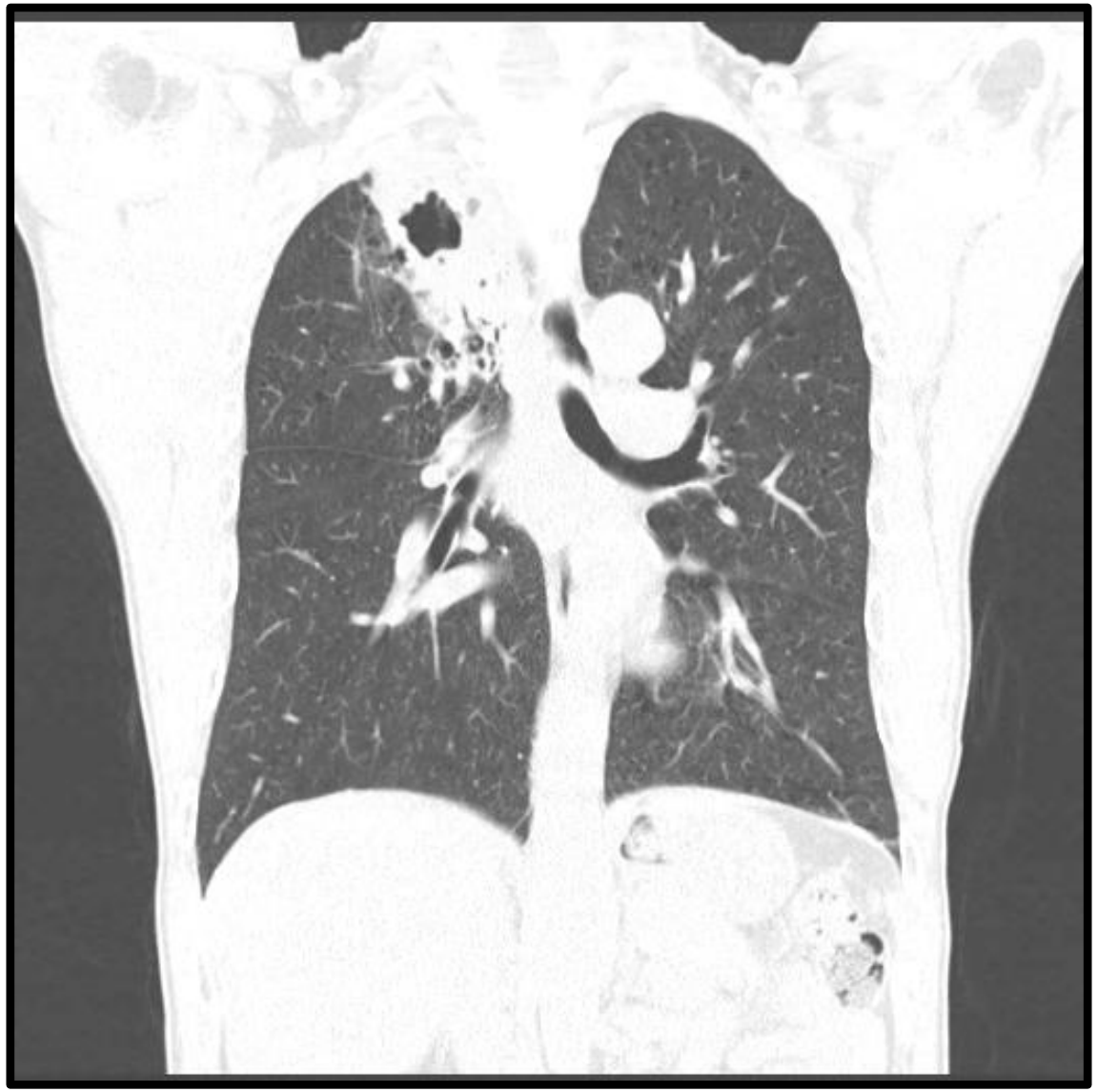
Case 3: 55/M

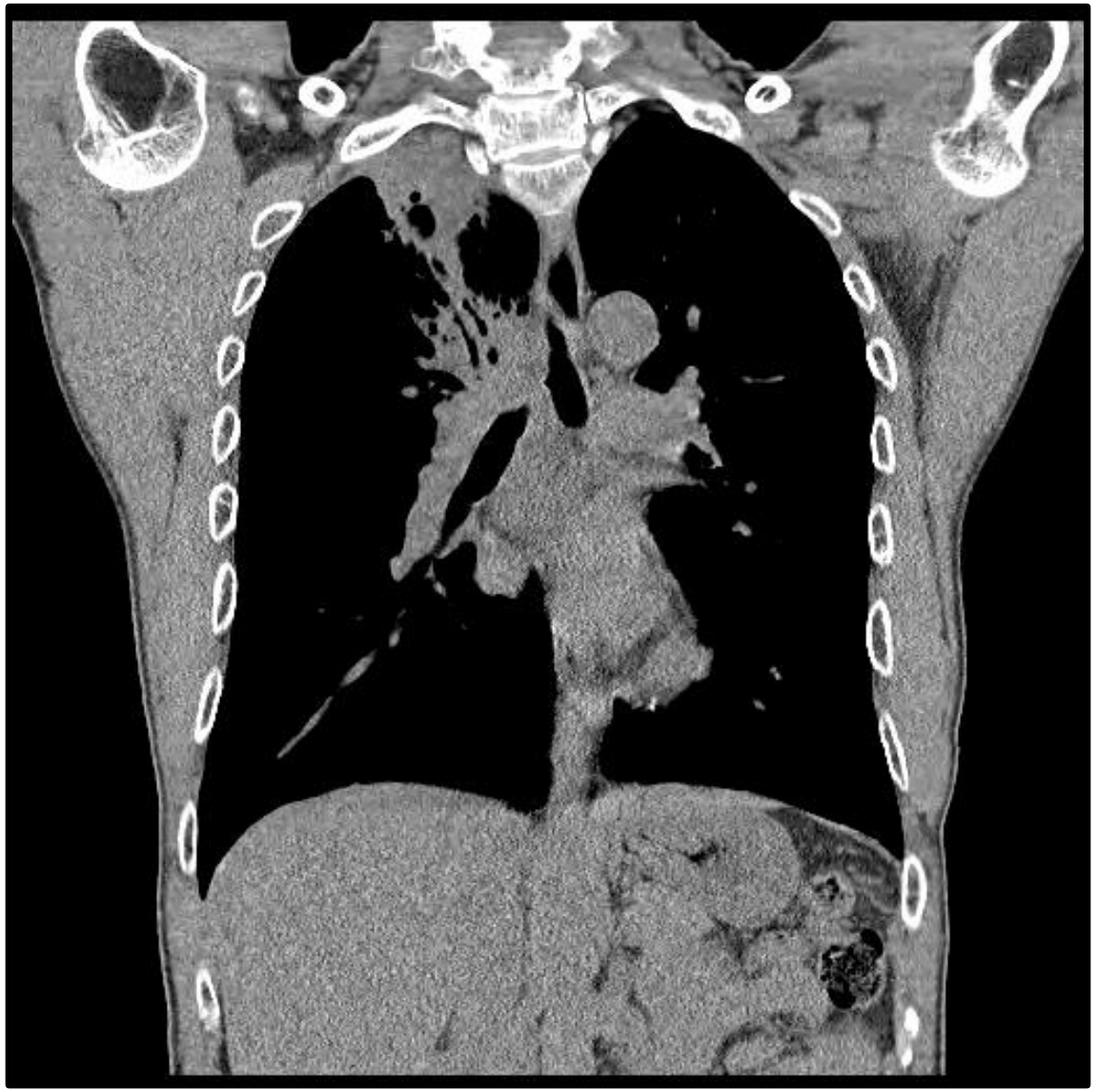
- Right chest discomfort for 2 mo
- Current smoker (1PPD for 35y)

Initial CXR (4 mo ago, LMC)

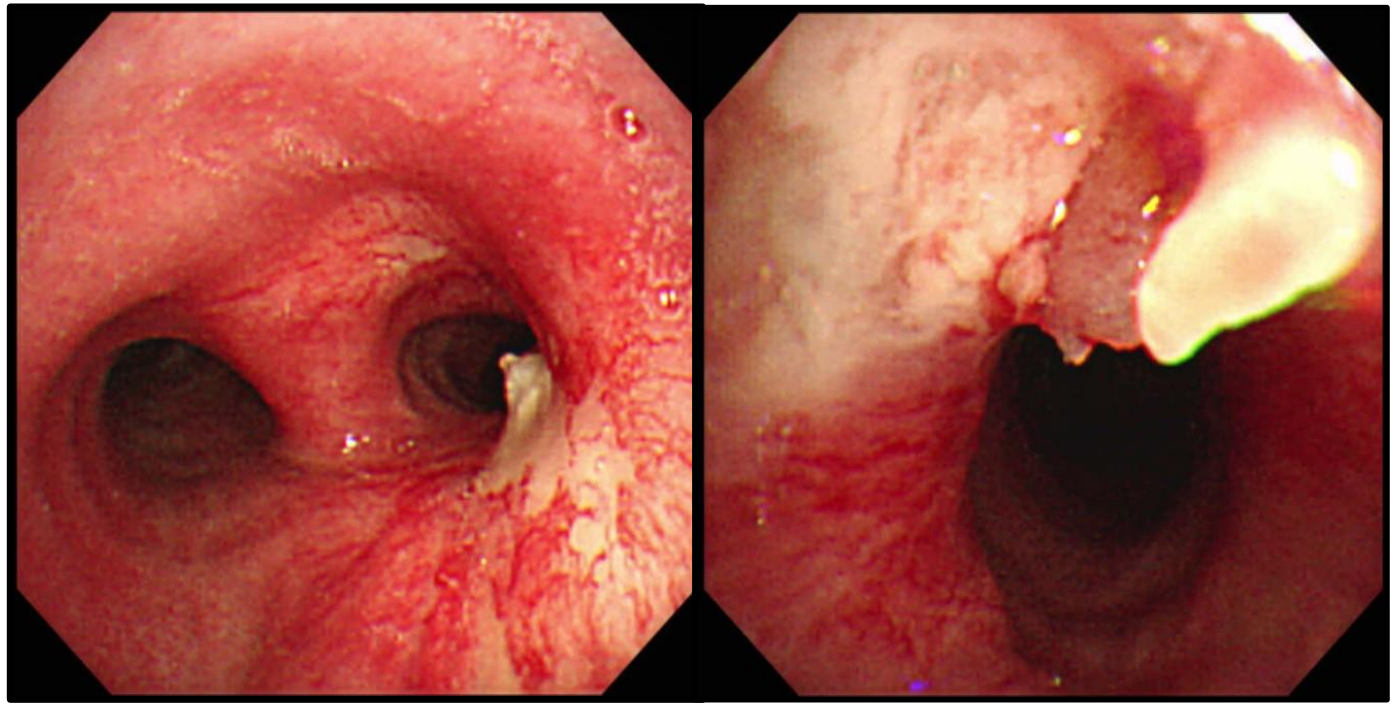


Initial Chest CT (4 mo ago, LMC)





Initial bronchoscopy (4 mo ago, LMC)



- Bronchial aspirate
  - AFB smear/TB-PCR (4+/+)
  - cytology: atypical cells
- Bronchoscopic biopsy
  - chronic inflammation

Q: what action should be taken next ?

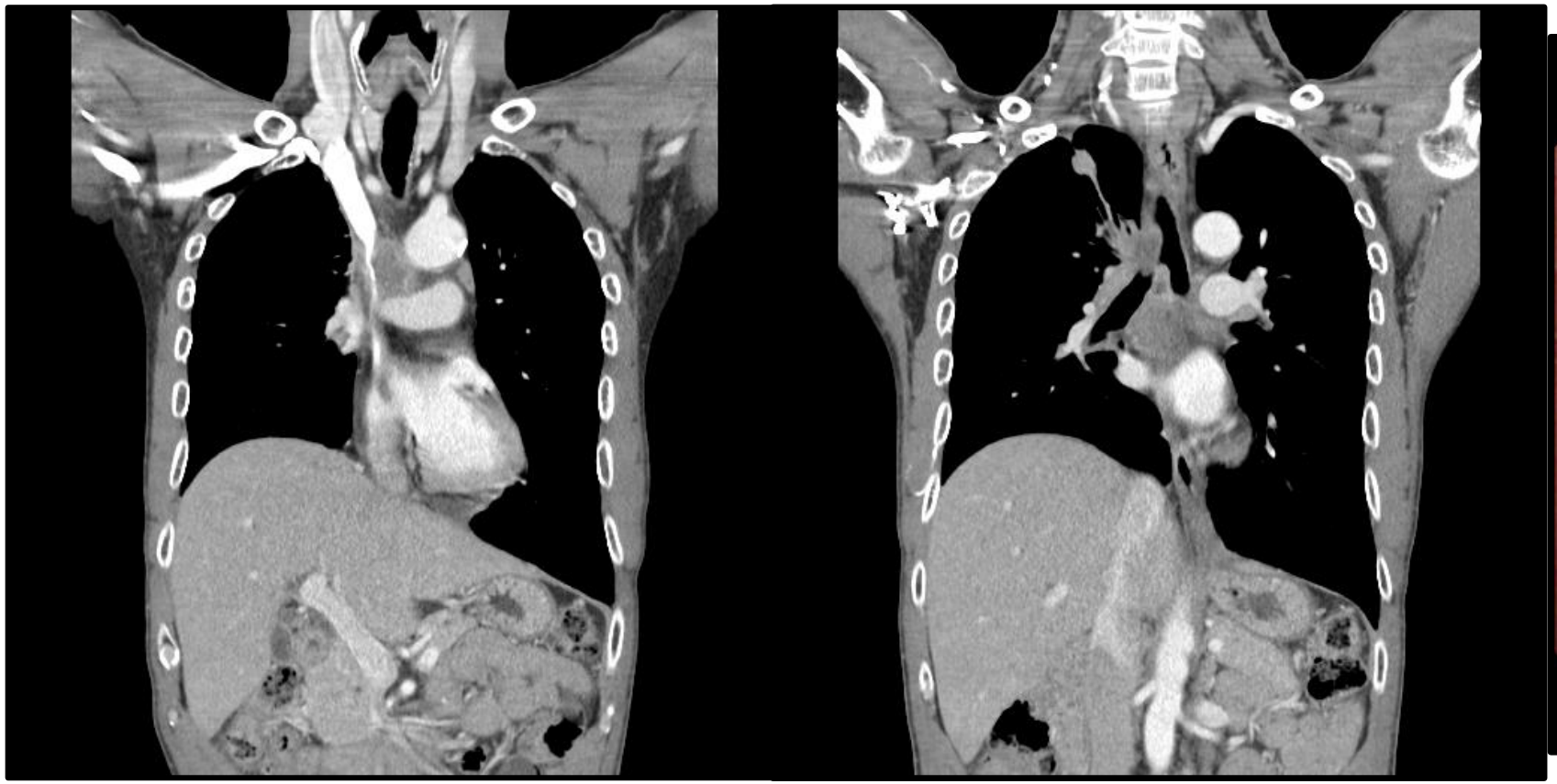
1. Initiate anti-tuberculosis treatment (HRZE) & re-assessment
2. Repeated bronchoscopic biopsy
3. Perform PET/CT scan
4. None of the above

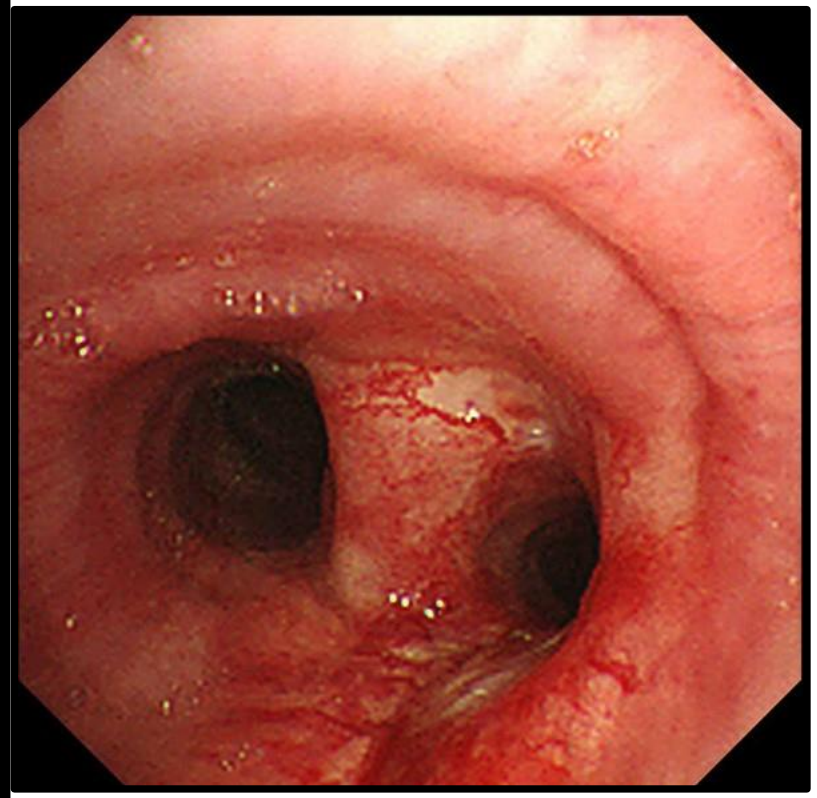
Vote 4

Case 3: 55/M

- HRZE taken
- Bronchial aspirate culture: MTB growth (DS)
- **Persistent chest pain even after 4 months of anti-TB treatment**
- Facial swelling & neck vein distension for the past month

Chest CT (At 4th mo of anti-TB Tx)

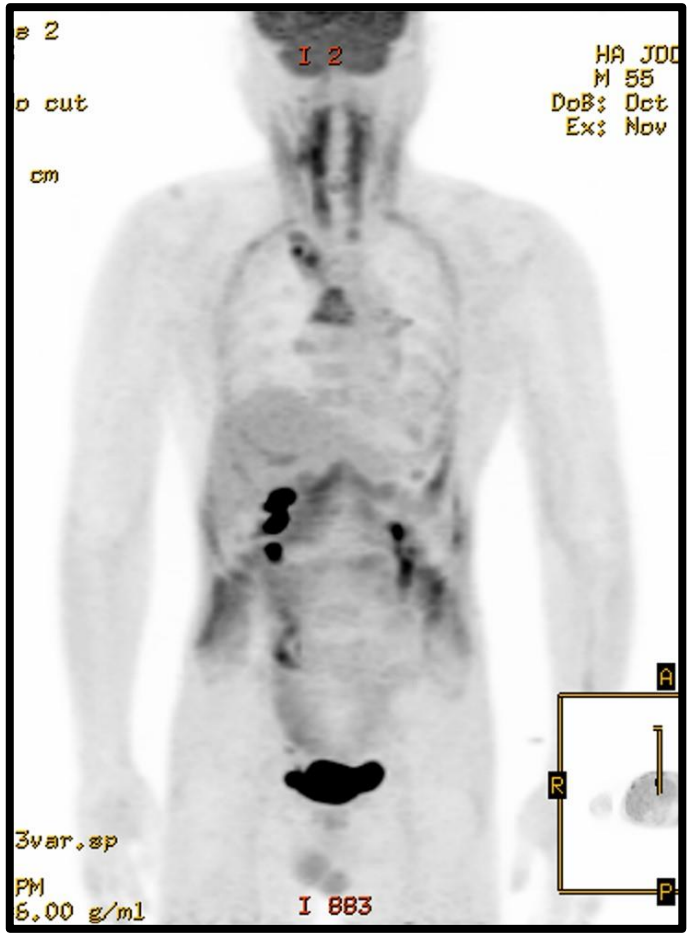




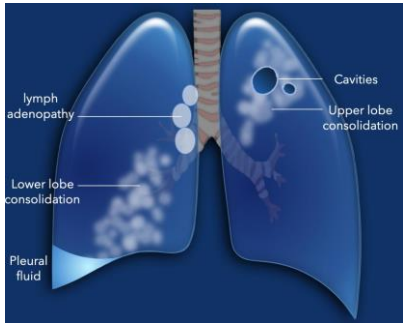
Case 3: 55/M

- Bronchial aspirate AFB smear (-)/Xpert MTB/RIF (+/-)
- Bronchial aspirate cytology: atypical cells
- **Bronchoscopic Bx: ADC**
- **ADC of lung, cT4N2M0**

  - EGFR/ALK/ROS1/K-RAS/PD-L1 (-/-/-/-/50%, TC2/IC1)



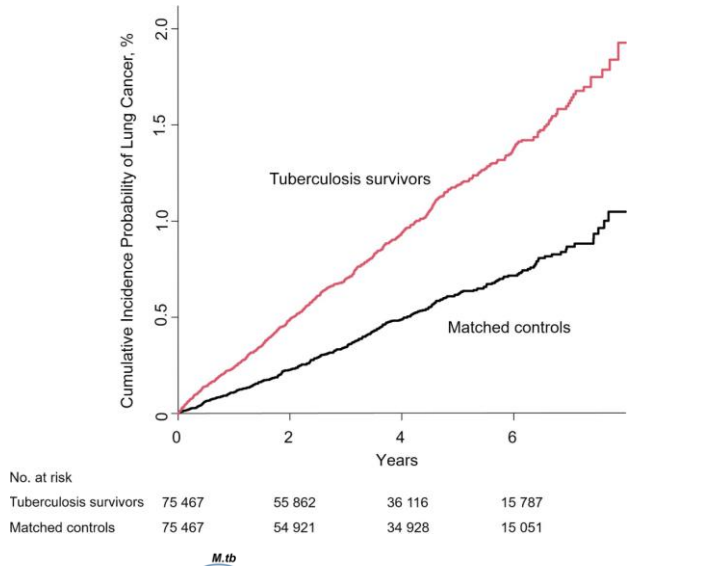
Co-existent TB and lung cancer

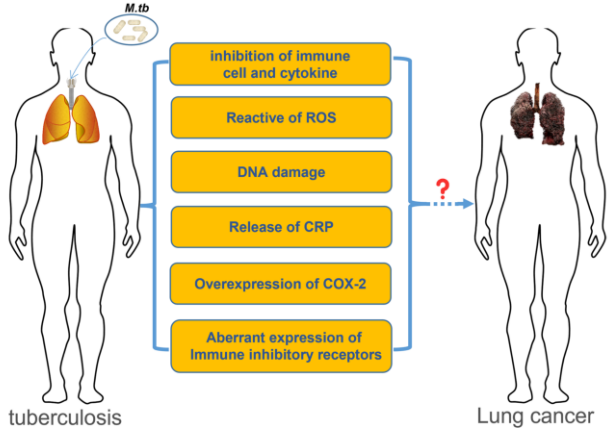


The radiology assistant: Imaging findings in TB

- **prevalence: 2-4%**

TB increases lung cancer risk





Moon et al. Clinical Infectious Diseases 2023

Qin et al. Infectious Agents and Cancer 2022

Lung cancer increases TB risk

Taiwanese population based study

Malignancy, primary location	N (% of total)	Person-year	Event	Rate*	SIR# (95% C.I.)
Total	1,105,009 (100.00)	6383055.73	19,906	312	1.31 (1.30–1.33)
Head and neck	85,950 (7.78)	521311.01	1,990	382	2.58 (2.37–2.80)
Digestive	394,258 (35.68)	1981200.05	5,990	302	1.50 (1.39–1.61)
Respiratory	131,116 (11.87)	543125.91	4,842	892	5.45 (4.92–5.97)

Shu et al. Scientific Reports 2019

Coexisting Bronchogenic Carcinoma and Pulmonary Tuberculosis in the Same Lobe: Radiologic Findings and Clinical Significance

Young Il Kim, MD[1]
Jin Mo Goo, MD[1]
Hyae Young Kim, MD[2]
Jae Woo Song, MD[3]
Jung-Gi Im, MD[1]

Objective: Bronchogenic carcinoma can mimic or be masked by pulmonary tuberculosis (TB), and the aim of this study was to describe the radiologic findings and clinical significance of bronchogenic carcinoma and pulmonary TB which coexist in the same lobe.

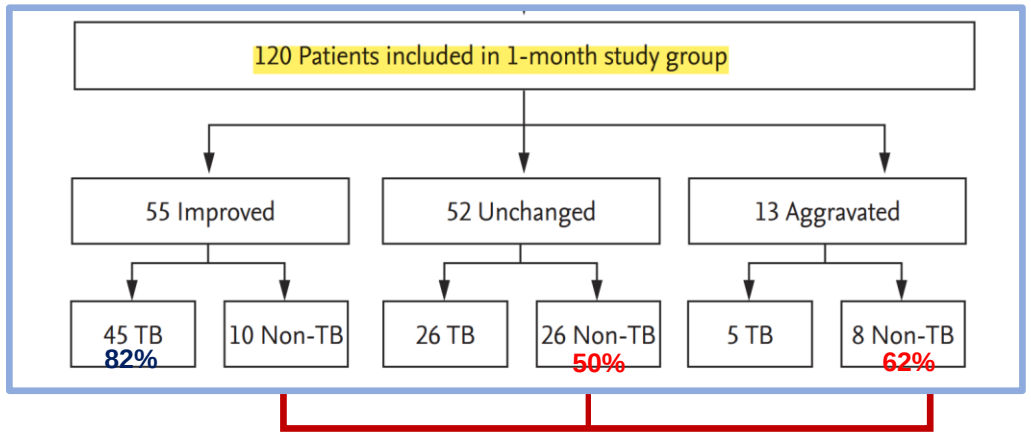
Korean J Radiol 2001

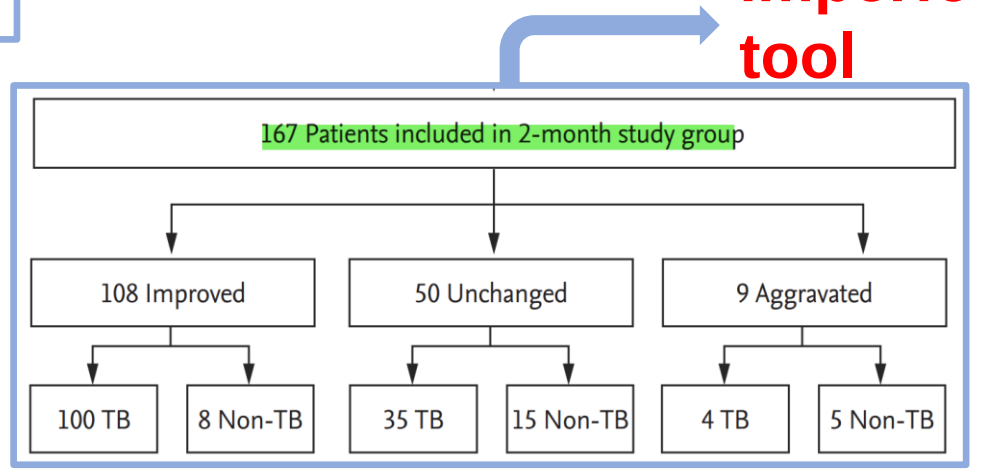
- N= 51
- Location: upper lobes (82%), cavitation (10%), mediastinal LNE (82%)
- ≥ Stage IIIB (61%)
- 21 patients with serial chest X-rays prior to diagnosis of lung cancer: delay in diagnosing lung cancer [mean **11.7 mo** (range, 1-24 mo)]

Careful follow-up (CT) is essential in the care of patients whose symptoms show little improvement despite anti-TB therapy

Timing of radiologic response of TB

- Retrospective study: Suspected PTB (n=267)
- Changes between baseline and 1- & 2- month CXR findings





imperfect tool

Table 3. Detailed diagnoses of 44 patients in the 1-month group with non-tuberculosis as the final diagnosis

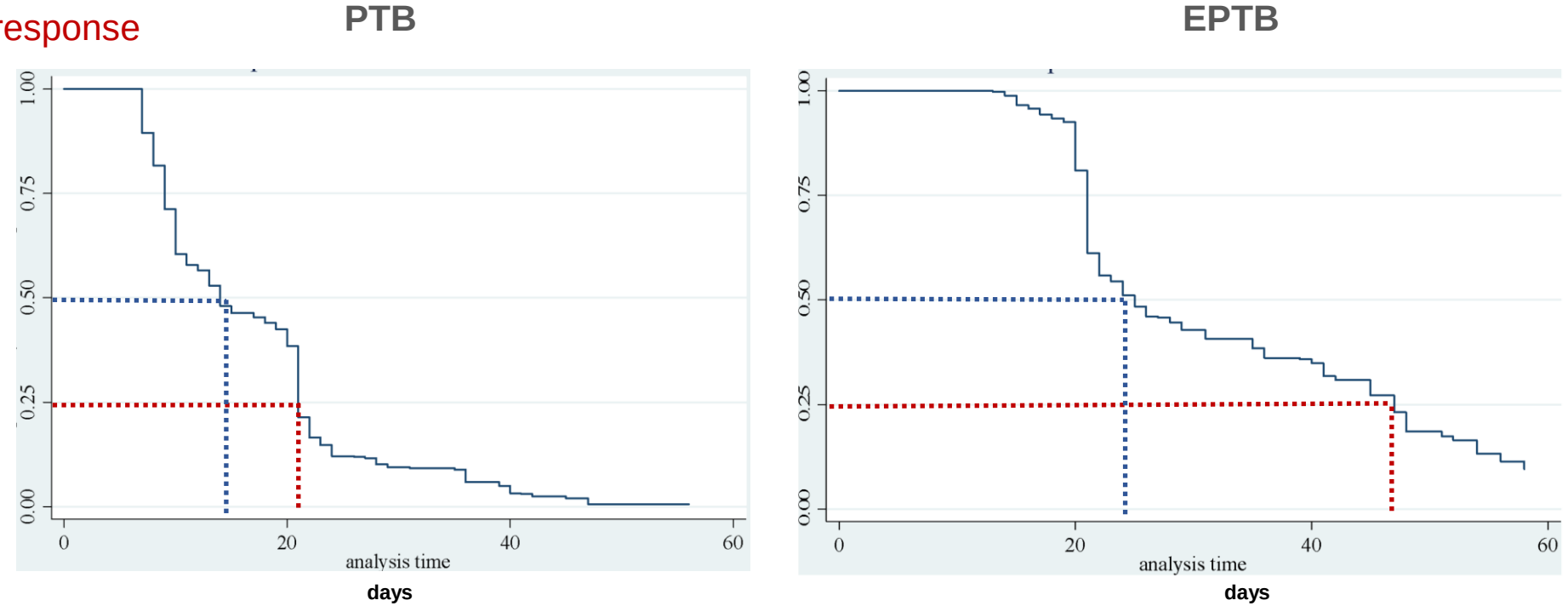
Variable	Total (n = 44)	Improved (n = 10)	Unchanged (n = 26)	Aggravated (n = 8)
Nontuberculous mycobacteria	16	6	9	1
Malignancy	14	0	8	6
Granuloma[a]	4	0	4	0
Sarcoidosis	2	1	1	0
Organizing pneumonia	2	1	1	0
Bacterial pneumonia	1	0	1	0
Diffuse panbronchiolitis	1	1	0	0
Castleman's disease	1	0	1	0
Fungal pneumonia	1	0	0	1
Necrotizing pneumonia	1	0	1	0
Non-specific inflammation	1	1	0	0

Lee et al. Korean J Intern Med 2020

Timing of clinical response of TB

- Prospective cohort study: PTB (n=804) & EPTB (n=804)
- Clinical response – **resolution of the initial symptoms and sign**
- DOT

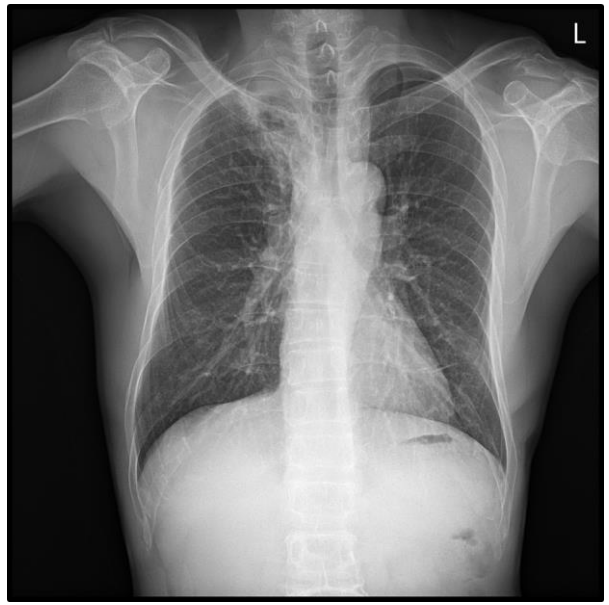
Clinical response



Feleke et al. PLos One 2018

Co-existent TB and lung cancer

- Suspicion of lung cancer => Dx of PTB



Clinical & radiologic findings strongly suggestive of lung cancer

- Anti-TB treatment
- Repeat biopsy
- PET/CT scan

Anti-TB treatment

- Close follow-up

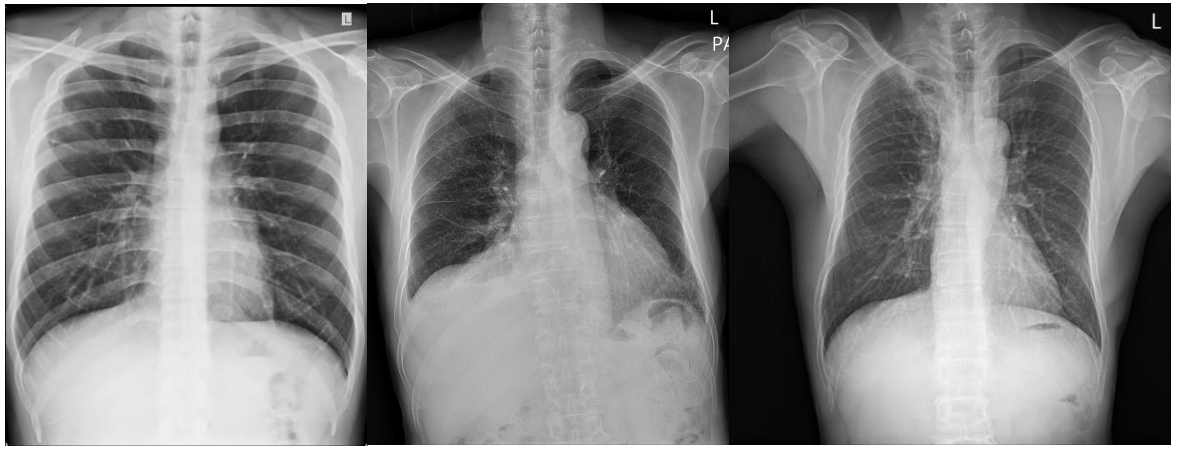
  - re-evaluation in **1mo**

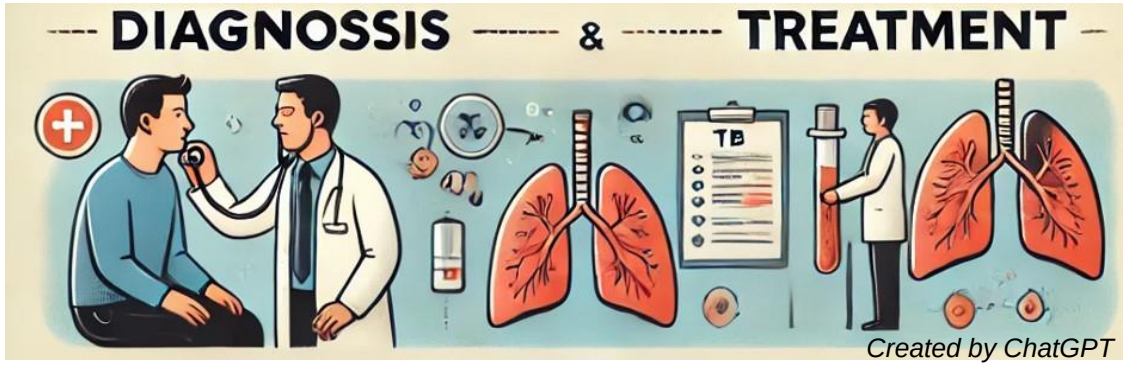
  (clinical response & CT)

Summary

- Culture-negative PTB
- TB-paradoxical response
- ADA for diagnosis of TPE
- Missed combined lung cancer

Case #1 Case #2 Case #3





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