대한 결핵 및 호흡기 학회
심포지엄

2011. 5. 23

순천향대학교병원
호흡기-알레르기내과

Case # 1

29/F

C.C: Dyspnea on exertion

remote onset) 3 개월 전

aggravation) 1 주일 전

Present illness

- 3개월 전부터 발생한 dyspnea on exertion(II-III/IV)과 동반된 general weakness와 fatigue가 있었고, 1주일 전부터 증상 악화되어 내원함 (III-IV/IV)
- Dyspnea는 자세의 변화에 차이가 없었음

Past history

- DM (-)
- Hypertension (-)
- TB (-), Allergies (-), Hepatitis (-)

- Social history
  - Alcohol drinking(-)
  - Cigarette smoking(-)
  - Office worker

- OP & hospitalization Hx. (-)

Review of system I

1. General

General weakness (+)

Fever (-)

Sweating (-)

Fatigue (+)

Chill (-)

Weight change (-)

2. Chest

Dyspnea (+)

Orthopnea (-)

Cough (-)

Sputum (-)

Chest pain (-)

Hemoptysis (-)

Review of system II

3. Abdomen

Loss of appetite(-)

Nausea (-)

Vomiting (-)

Dysphagia (-)

Abdominal pain (-)

4. Genitourinary tract

Hematuria (-)

5. Back & Extremities

Edema (-)

Back pain (-)

Physical examination I

1. Vital sign

BP 110/70mmHg　　PR 88 회/분

BT 37.2 ℃　　RR 24회/분

2. General appearance

Chronic ill-looking appearance with alert mental status

Physical examination II

3. HEENT

No pale conjunctivae No dehydrated tongue

No cervical lymph node palpitation

4. Chest

Right lung

Percussion: dull Vocal fremitus: decreased

Decreased breathing sound

Left lung; normal breathing sound and fremitus

Regular heart beat without murmur

Physical examination III

5. Abdomen

Soft & flat

Normal bowel sound

Tenderness/Rebound tenderness (-/-)

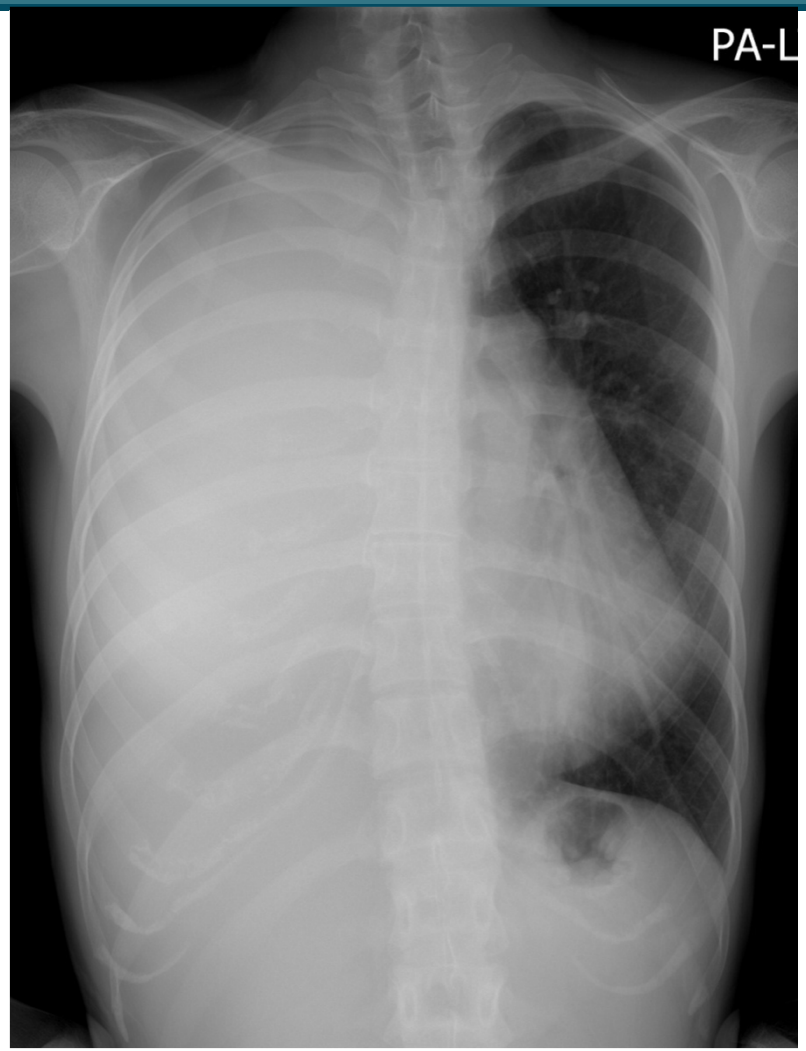
Organomegaly (-)

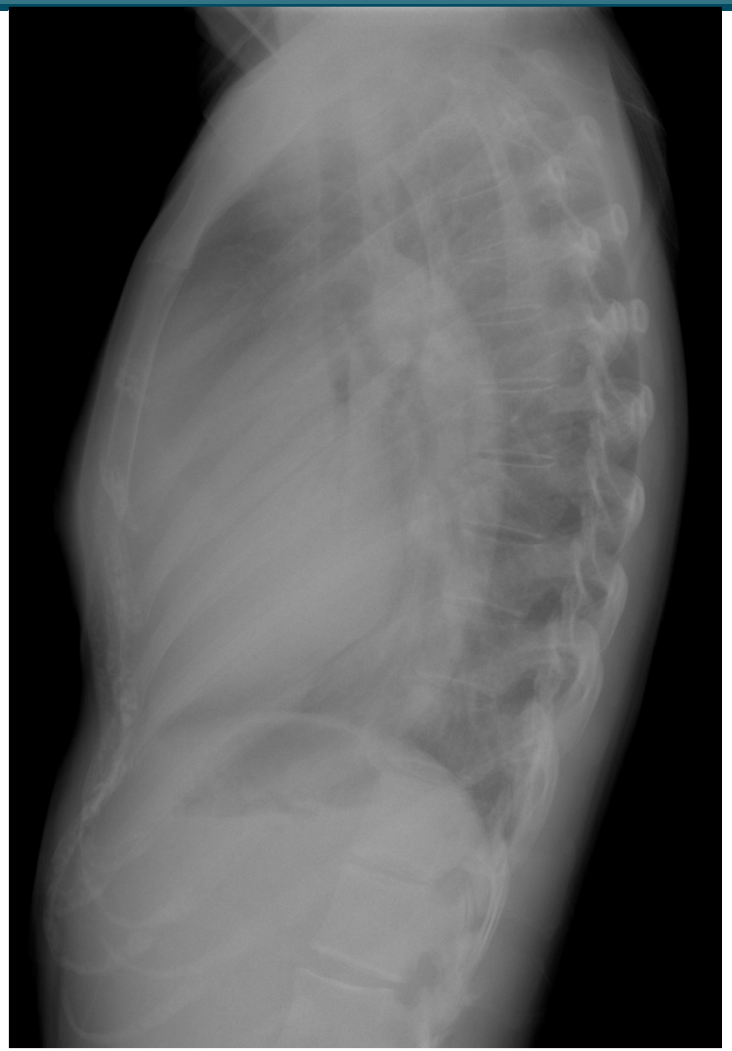
6. Back & Extremities

Pretibial pitting edema (-)

CVA tenderness (-)

Chest PA





Laboratory finding

ABGA

7.41- 42 - 88 - 28

CBC	결과	단위	참고치
WBC	9.9	10^3/ul	4.0~10.0
Hemoglobin	13.5	g/dl	13.0~18.0
Hematocrit	38.9	%	38.0~52.0
Platelet count	251	10^3/ul	130~400

Laboratory finding

Chemistry	결과	단위	참고치
Total protein	5.6	g/dl	5.8~8.1
Albumin	3.4	g/dl	3.1~5.2
AST	12	IU/l	0~40
ALT	10	IU/l	0~40
BUN	7.7	mg/dl	8.0~20.0
Creatinine	0.8	mg/dl	0.6~1.2
LDH	433	U/L	106~211
Amylase	38.1	U/L	28~100

Electrolyte	결과	단위	참고치
Sodium	138	mmol/L	135 ~ 153
Potassium	4.0	mmol/L	3.5 ~ 5.3
Chloride	109	mmol/L	99 ~115

Problems list

DOE

Pleural effusion

General weakness

Fatigue

Impression

Tuberculous pleurisy

GY malignancy with pleural metastasis

Parasite infestation

Diagnostic plan

Diagnostic thoracentesis

Chest CT with enhancement

Pleural biopsy

ELISA test for *P.Westermani*

Pleural fluid

Before centrifugation

After centrifugation

Pleural fluid analysis

	결과	참고치
pH	7.60	
RBC	12,825/㎕	
WBC	3,600/㎕	1,000-5,000
Neutrophil	1 %	5%
Lymphocyte	98 %	5%
Total protein	4.3 mg/dL	serum 5.6 mg/dL
Albumin	3.1 mg/dL	serum 3.4 mg/dL
LDH	245 U/L	serum 433 U/L
TG	1,160 mg/dL	(110 > TG : chylothroax) serum 75 mg/dL
Total cholesterol	89 mg/dL	< 45 mg/dL
ADA	10 IU/L	
CEA	0.78 ng/mL	
α-FP	2.86 ng/mL	
Β-HCG	<10 IU	

Radiologic finding

질문 ?

Diagnosis

Lymphangioleiomyomatosis（LAM)

Progress

HAD #1

Closed thoracotomy (right thorax)

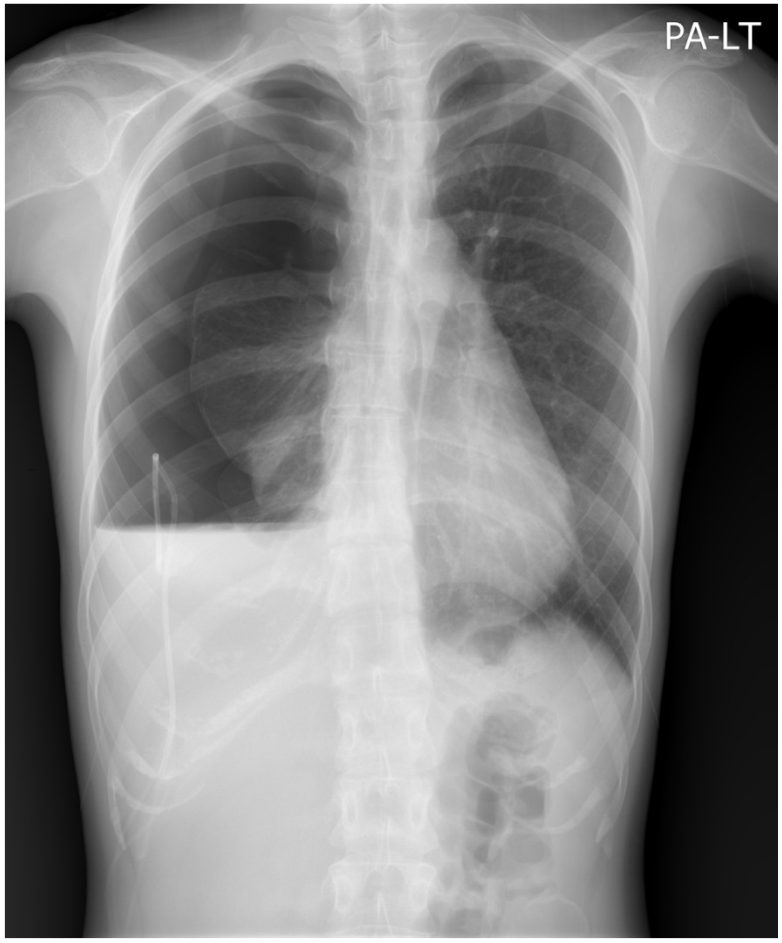
1,000 mL/day drainage for two days

Treatment for chylothorax;

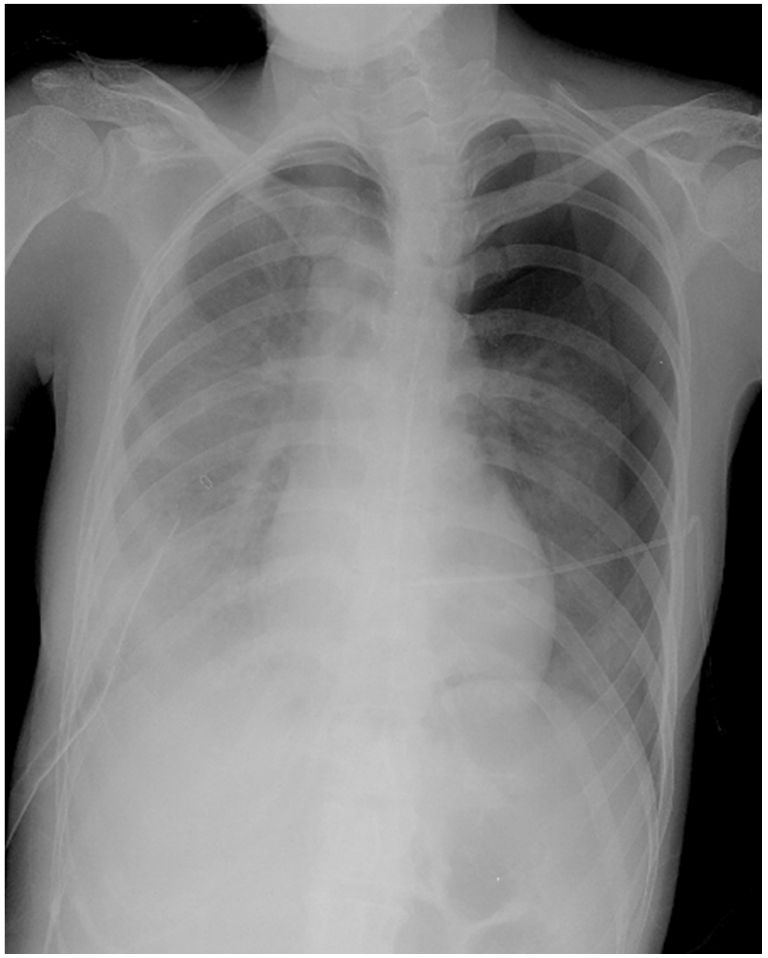
- NPO and TPN including medium-chained TG
- Pleurodesis (?)

Progress

HAD #3



HAD #5



Progress

Treatment for both pneumothorax and chylothorax (?)

High recurrence rate of pneumothorax in LAM
→ Chemical pleurodesis or surgery should be considered for the initial pneumothorax

Pleural adhesions
→ may make future lung transplant procedures more complicated

HAD#7

VATS for talc pleurodesis and lung biopsy (RUL,RML)

Chest. 2006:129:1274-81

Pathologic findings

Progress

HAD#7

VATS (biopsy and pleurodesis)

HAD#10

Removal of left chest tube

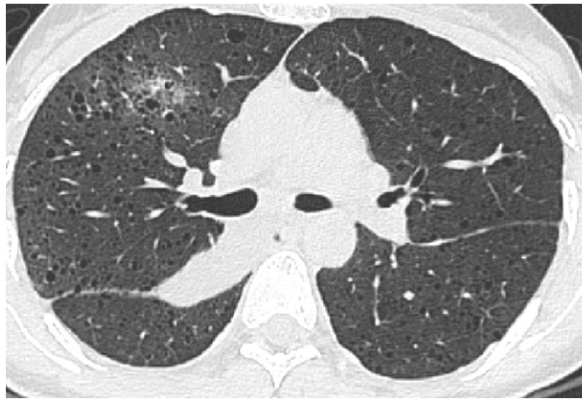
Recur of pneumothorax after 6 hours

VATS for pleurodesis

HAD# 15

Discharge

Progress



2007. 9

2007. 12

2008. 6

Tamoxifen

FVC	50
FEV_1	63
DLco	56

FVC	45
FEV_1	56
DLco	72

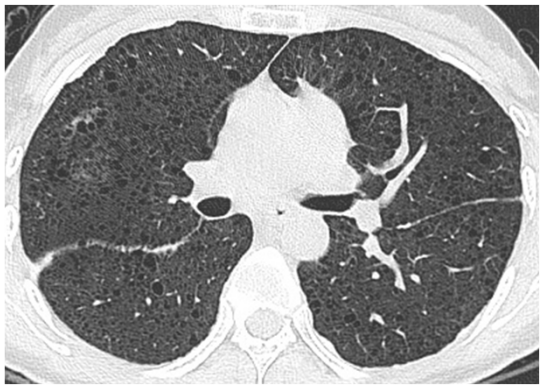
Progress

2008. 6

FVC 45

FEV_1 56

DLco 72



2009. 2
Sirolimus

FVC 31

FEV_1 38

DLco 72

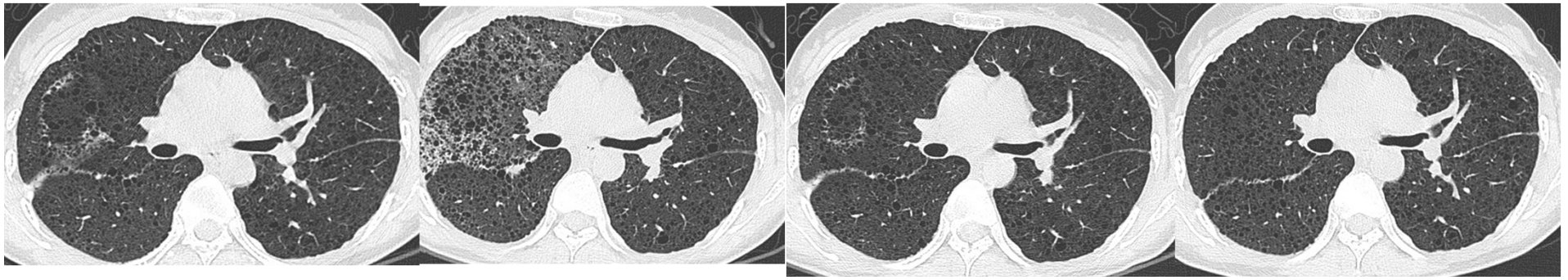
2010. 1

FVC 35

FEV_1 44

DLco 68

Progress



2010. 1.	2010.4	2010.7	2010.12
FVC 35	FVC 41	FVC 45	FVC 39
FEV_1 44	FEV_1 49	FEV_1 41	FEV_1 42
DLco 61	Dlco 53	DLco 57	DLco 61
	Sirolimus		

Review

Lymphangioleiomyomatosis (LAM)

- Progressive, cystic lung disease
- Inappropriate activation of
  mammalian Target Of Rapamycin(mTOR) signaling

Pneumothorax & Chylothorax in LAM :
60-81% & 22-39% during the course of disease

N Engl J Med. 2011:364:1595-606
Chest. 2003 :123:623-7

Review (Chylothorax in LAM)

Mechanism of Chylothorax :

(1) Chyle leak from the thoracic duct or its tributaries:

secondary to proximal lymphatic obstruction or

direct involvement by proliferating smooth muscle cells

(2) General oozing from pleural lymphatics or collateral vessels

(3) Transdiaphragmatic flow of chylous ascites

Chest. 2003 :123:623-7.

Review (Tx of chylothorax)

- A low-fat diet with medium-chain triglycerides
  → generally unsuccessful
- Hyperalimentation
  → may decrease the rate of chylous leak
- Repeated thoracenteses
  → control reaccumulation of chylothorax in some patients

- Parietal pleurectomy : usually effective
- Chemical or surgical pleurodesis :
  equally effective in preventing recurrent pleural effusion

Chest. 2003 :123:623-7.

Review (pleurodesis)

- Pleural adhesions → may make future lung transplant procedures more complicated
- Previous bilateral pleurodesis : not absolute CIx to subsequent lung transplantation
- Chemical or surgical pleurodesis :
  increased perioperative bleeding following lung transplantation with no effect on length of hospital stay
- In cases of unilateral pleurodesis, single-lung transplantation can be performed on the contralateral side

Chest. 2006 ;129:1274-81.

Chest. 2003 :123:623-7.

Review (Sirolimus)

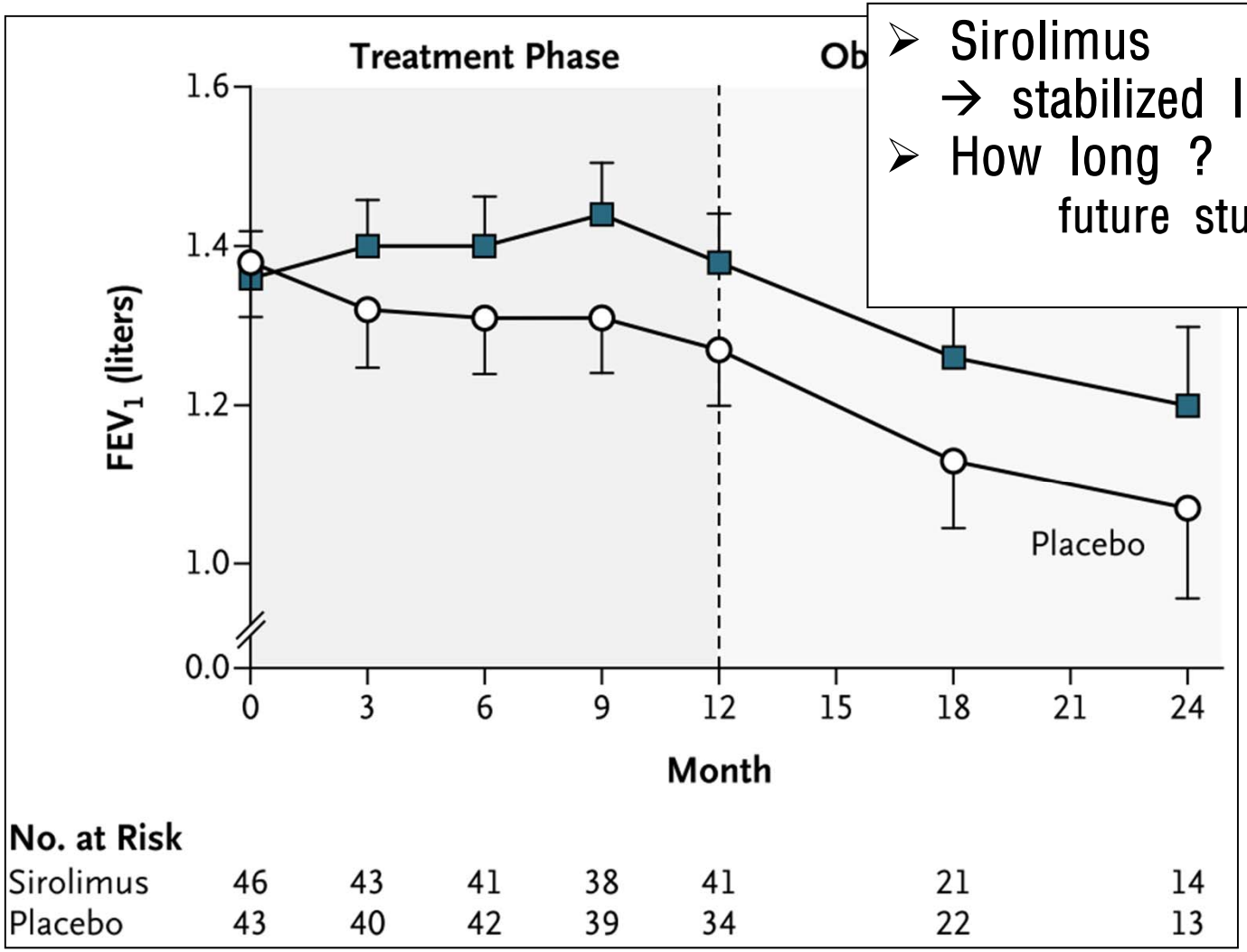
Sirolimus(rapamycin)

- Inhibits mTOR

- International, multicenter, randomized, double-blind study
- 12-month comparison of sirolimus with placebo, followed by a 12-month observation period
- 89 patients with LAM, moderate lung impairment
- primary end point : difference between the groups in the rate of change (slope) in FEV1

N Engl J Med. 2011:364:1595-606

Review (Sirolimus)



- Sirolimus
  → stabilized lung function
- How long ?
  future studies..

N Engl J Med. 2011:364:1595-606

Case # 2

32/M

C.C: Chest pain

remote onset) 3 일 전

aggravation) 1 일 전

Present illness

- 내원 3일 전 등산하다가 미끄러지면서 가슴을 부딪히고 나서부터 숨쉴 때마다 가슴을 누르는 듯한 간헐적인 불편감이 있었음.
- 내원 1일 전부터는 숨쉴 때 마다 찌르는 듯한 통증으로 변하였음.
- 양쪽 흉부에 통증이 있었으나 왼쪽이 더 심하였고

  통증의 정도는 Numeric Rating Scale 4-5점이었음.
- 내원 1일 전부터 운동시 호흡곤란(II-III/IV)을 동반함.

Past history

- DM (-), Hypertension (-), TB (-)

- Social history
  - Alcohol (+) 주 1회 소주 1병
  - Never smoker
  - Sales-worker
  - Living in an apartment

- OP & hospitalization Hx. (-)

Review of system I

1. General

General weakness (-)

Fever (-)

Sweating (-)

Fatigue (-)

Chill (-)

Weight change (-)

2. Chest

Dyspnea (+)

Orthopnea (-)

Cough (+) inspiration

Sputum (-)

Chest pain (+)

Hemoptysis (-)

Review of system II

3. Abdomen

Loss of appetite(-)

Nausea (-)

Vomiting (-)

Dysphagia (-)

Abdominal pain (-)

4. Genitourinary tract

Hematuria (-)

5. Back & Extremities

Edema (-)

Back pain (-)

Physical examination I

1. Vital sign

BP 120/70mmHg　　PR 74 회/분

BT 36.6 ℃　　RR 22회/분

2. General appearance

Acute ill-looking appearance with alert mental status

Physical examination II

3. HEENT

No pale conjunctivae No dehydrated tongue

No cervical lymph node palpitation

4. Chest

Right lung; normal breathing sound and fremitus

Left lung;

Percussion: hyperresonant Vocal fremitus: decreased

Decreased breathing sound

Regular heart beat without murmur

Chest wall tenderness(-)

Physical examination III

5. Abdomen

Soft & flat

Normal bowel sound

Tenderness/Rebound tenderness (-/-)

Organomegaly (-)

6. Back & Extremities

Pretibial pitting edema (-)

CVA tenderness (-)

Problems list

Chest pain

Dyspnea on exertion

Abnormal breathing sound , Left thorax

Impression

Primary spontaneous pneumothorax, Left

R/O Traumatic pneumothorax, Left

Diagnostic plan

Chest PA and left lateral

Chest CT

질문 ?

Radiologic findings

Laboratory finding

CBC	결과	단위	참고치
WBC	5.7	10^3/ul	4.0-10.0
Hemoglobin	15.6	g/dl	13.0-18.0
Hematocrit	46.4	%	38.0-52.0
Neutrophil	58.9	%	40-74
Lymphocyte	1.8	%	19-48
Monocyte	0.4	%	3.4-9
Eosinophil	0.1	%	0-7
Basophil	0.0	%	0-1.5
Platelet count	165	10^3/ul	130-400

Laboratory finding

Chemistry	결과	단위	참고치
Total protein	7.0	g/dl	5.8-8.1
Albumin	4.6	g/dl	3.1-5.2
AST	34	IU/l	0-40
ALT	13	IU/l	0-40
BUN	19	mg/dl	8.0-20.0
Creatinine	1.0	mg/dl	0.6-1.2
LDH	165	U/L	106-211
Electrolyte	**결과**	**단위**	**참고치**
Sodium	143	mmol/L	135 - 153
Potassium	3.8	mmol/L	3.5 - 5.3
Chloride	105	mmol/L	99 -115

Spirometry and DLco

Spirometry	reference	measure	% Ref
FVC	4.80	3.17	66
FEV1	3.83	2.99	78
FEV1/FEV%	79	94	
Lung volume			
TLC	6.24	4.89	78
RV	1.66	1.62	98
RV/TLC	28	33	
DLco	25.1	19.9	79

Progess

HAD#7

- VATS guided wedge resection of bulla in apicoposterial segment
- Apical pleurectomy
- Lung biopsy on LUL ant. & LLL sup. Segment

Lung biopsy

병리소견

Diagnosis

Pulmonary Langerhans Cell Histiocytosis

Progess

HAD#11

Chest tube removal

HAD# 17

Discharge

Pulmonary Langerhans Cell Histiocytosis, PLCH

- Rare disorder of unknown aetiology
- Predominantly in young smokers
- Peak at 20–40 yrs

- Pathologic cell type : Langerhans cell
  a differentiated cell of the monocyte-macrophage line
- Affect reticuloendothelial system, bones, nervous system, skin, and other organs

Eur Respir J. 2006 Jun;27(6):1272-85.

Clinical presentation

Present to medical attention in one of several ways :

1. Incidental abnormalities on chest radiographs (25%)
2. Spontaneous pneumothorax (10–20%)
   chest pain leads to the diagnosis
3. Respiratory or constitutional symptoms (two-thirds)
   especially fever or weight loss

Eur Respir J. 2006 Jun;27(6):1272-85.

Prognosis

- Course of PLCH : difficult to predict

- Some patients: spontaneous remission of symptoms
- Others: progressing to end-stage fibrotic lung disease

N Engl J Med 2002;346:484-90

Prognosis

- Median survival : 12.5 years from the time of Dx (< general population)
- 628 person-years of follow-up,
  33 deaths-15 patients attributed to progressive respiratory failure

Retrospective analysis (histopathologically PLCH , Mayo Clinic 1976/1-1998/12)

Characteristics at the time in 102 Adults			
Characteristic	**Value**	**Median**	**Range**
Sex (no.)	M/F : 42/62		
Age (yr)		38.0	18–70
Smoking history(+)	97		
Never smoker	4		
Extrapulmonary involvement(no.)	17		
Classification of findings — no. (%)			
Normal	11 (13.6)		
Restrictive	37 (45.7)		
Obstructive	22 (27.2)		
FEV1 % of predicted		71	23–124

N Engl J Med 2002;346:484-90

PLCH in Korea

Retrospective analysis, follow-up: 1-180 months

Characteristics at the time in 56 Adults			
Characteristic	**Value**	**Median**	**Range**
Sex (no.)	M/F : 48/8		
Age (yr)	43	38.0	18–67
Smoking history(+)	44 (79%)		
Never smoker	8		
Extrapulmonary involvement(no.)	12		
Classification of findings — no. (%)			
Normal	26 (61%)		
Restrictive	7 (16%)		
Obstructive	3 (7%)		
FEV1 % of predicted		76(mean)	±24

Tuberc Respir Dis 2009;66:98-103

PLCH in Korea

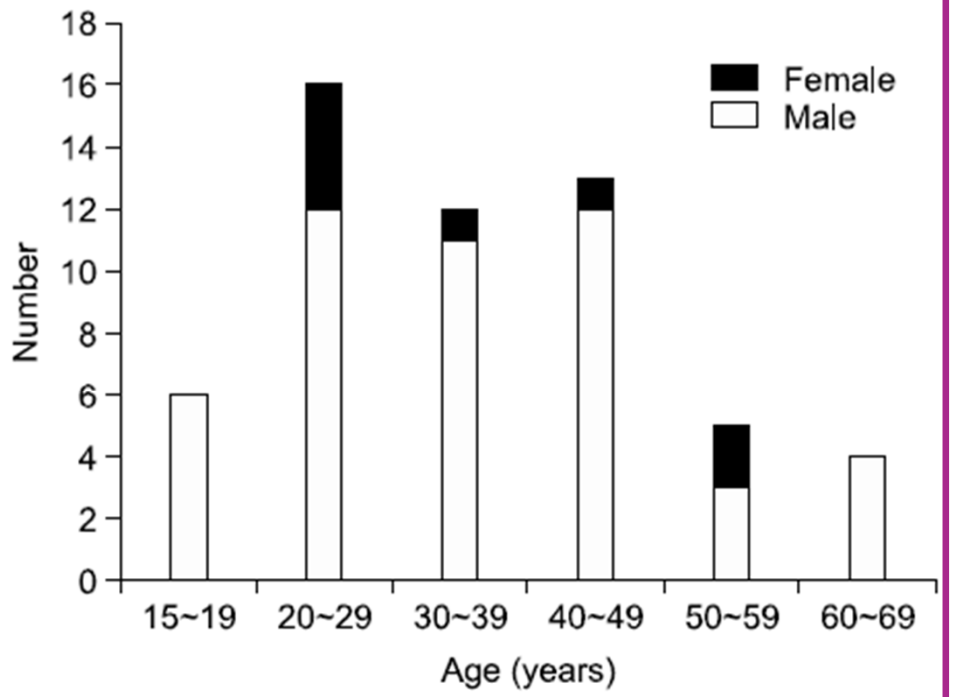


Figure 1. Age and sex distribution in patients with PLCH.

Prognosis

50% : 자발적으로 혹은 스테로이드 치료만으로 회복

10-20%: 재발성 기흉, 만성폐성심을 동반한 만성 폐부전으로 진행

추적기간 중 56명 중 2명 사망

Tuberc Respir Dis 2009;66:98-103

Prognosis

- Predictors of a poor outcome in PLCH

  - more advanced cystic changes on HRCT
  - older age
  - lower FEV1/FVC
  - higher residual volume/total lung capacity
  - lower DLco
  - presence of pulmonary hypertension

Eur Respir J. 2006 ;27:1272-85.

Can Respir J. 2010 ; 17: e55–e62.

Treatment

- Smoker→ smoking cessation
- Non-smoker→ ?
  - Glucocorticoid therapy - symptomatic patients
  - Cytotoxic - multisystem LCH
    (vinblastine, cyclophosphamide, methotrexate, 2-chlorodeoxyadenosine (cladribine) and etoposide)

Thorax. 2009;64:274

Respir Med. 2008;102:316

Treatment

- Pneumothorax

  recurrence rate : high → pleurodesis

- Lung transplantation

  when severe respiratory failure develops

  (severe pulmonary hypertension)

Future therapies

- No randomized trials of therapy
- Effect of smoking cessation and corticosteroid monotherapy, combination prednisone and vinblastine → ongoing

Can Respir J. 2010 ; 17: e55–e62.

Case # 3

36/F

C.C: Dyspnea on exertion

Fatigue

onset) 1 개월 전

Present illness

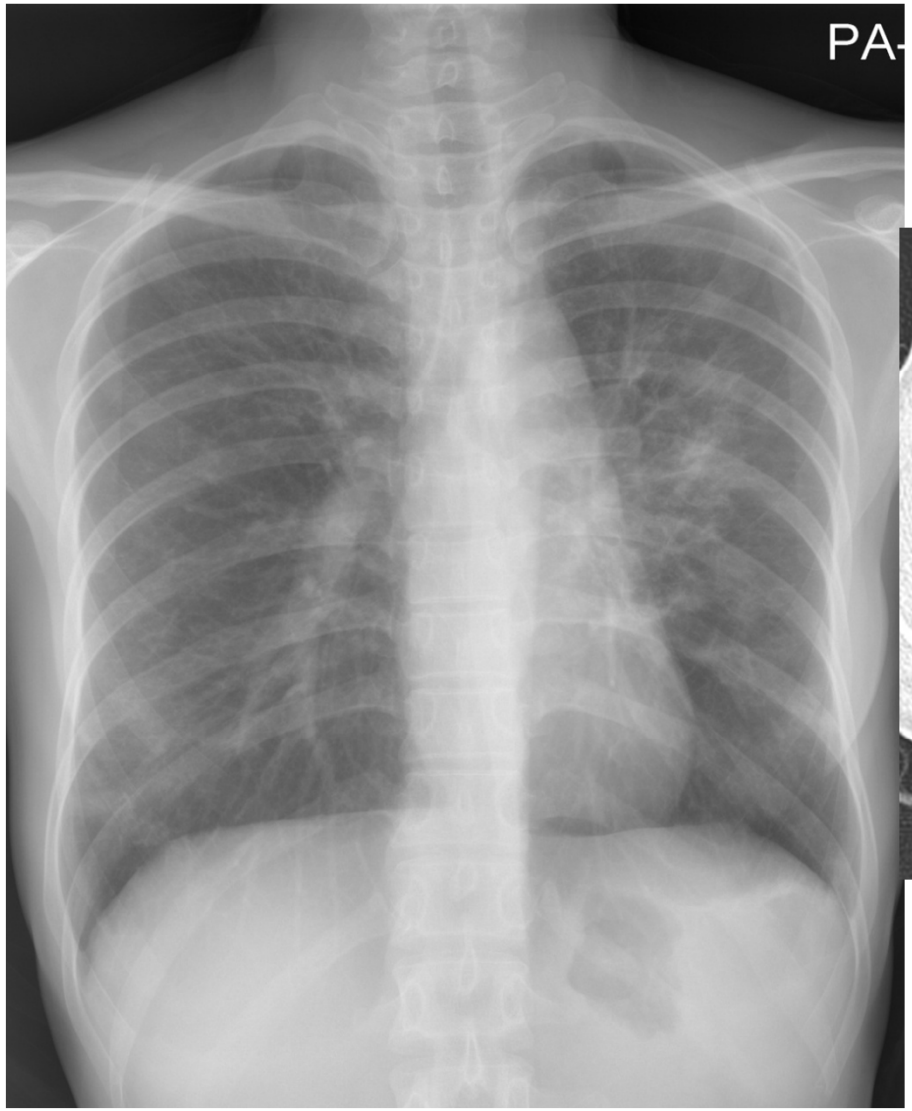
- myalgia, chill, fatigue 있었음.
- 1개월 전 dry cough와 dyspnea on exertion (I-II/IV)이 있어 내원

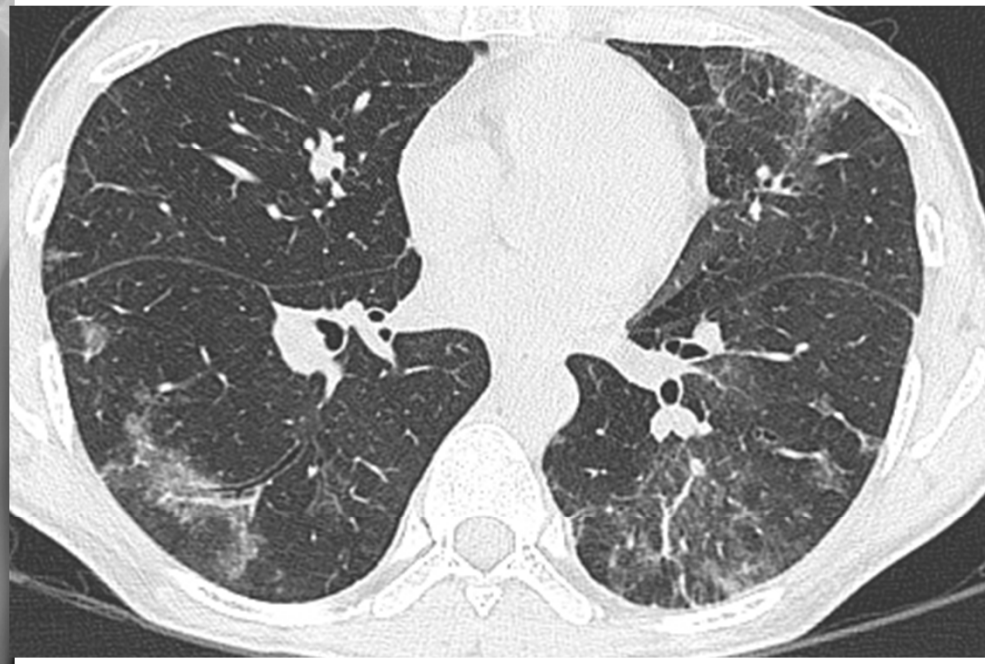
Past history

- 18 개월 전; asthma와 allergic rhinitis
  - cough, wheezing, dyspnea on exertion
  - PC 20 (methacholine) = 2.32 mg/mL
  - Nasal smear ; eosinophil 25%
- 이후 LABA와 steroid inhalation, LTRA 로 치료

Past history

- 10 개월 전; dry cough, dyspnea 악화, fatigue
  - FEV1 56%, DLco 61%
  - sputum eosinophil count 28%
  - 입원 권유 – 조직 검사- 거절
  - Chest PA 와 HRCT

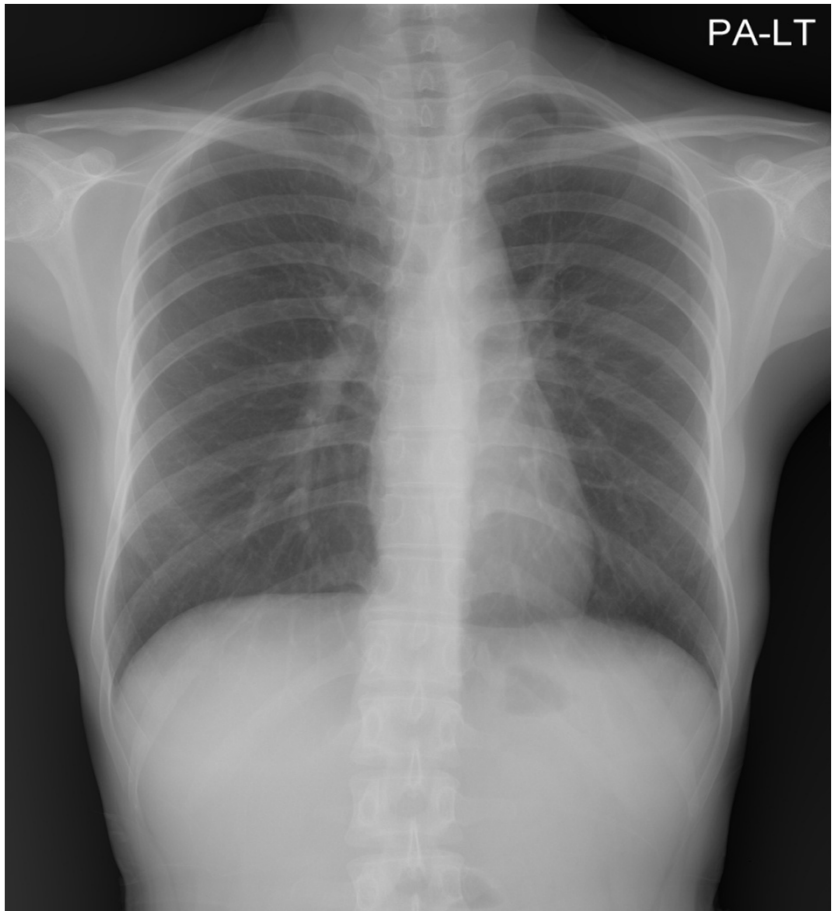




- prednisolone 30 mg/day

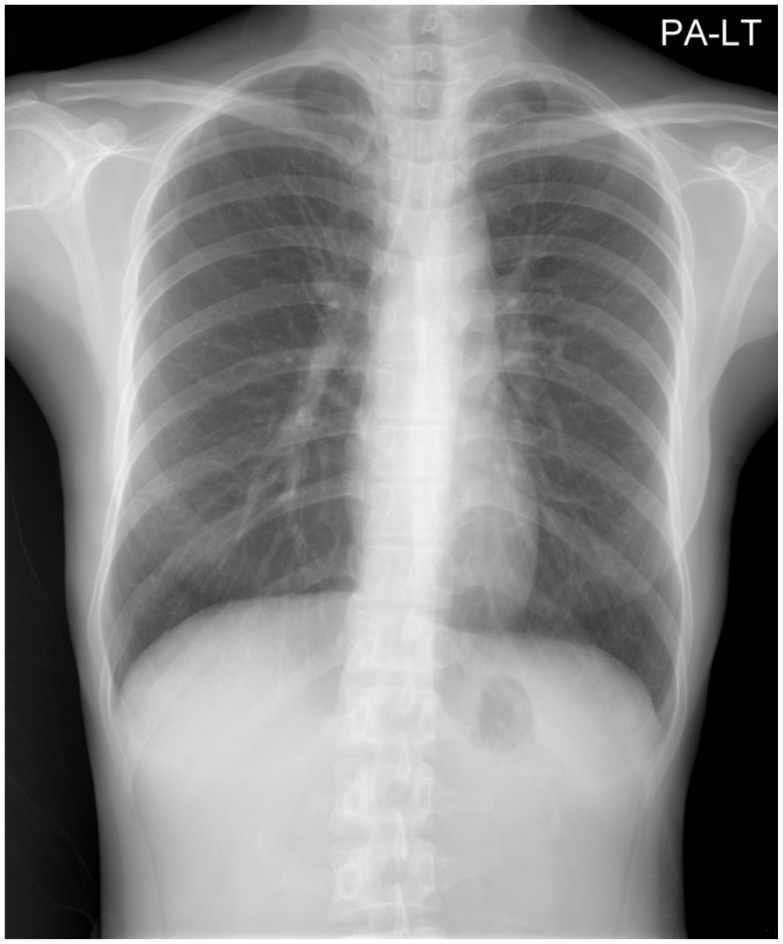
Past history

- 10 개월 전 (스테로이드 사용 1 주일 후)
  - FEV1 56% → 101%, DLco 61% → 69%
  - 증세의 호전
  - Chest PA



Past history

- 10 개월 전 (스테로이드 사용 총 2 주- 2 개월 후)



- Well-controlled asthma
  - Ciclesonide

Past history

- DM (-), Hypertension (-), TB (-), Hepatitis (-)

- Social history
  - Alcohol (-), Never smoker
  - Housewife
  - Living in an apartment

- OP & hospitalization Hx. (-)

Review of system I

1. General
   - General weakness (-)
   - Fever (-)
   - Sweating (-)
   - Fatigue (+)
   - Chill (-)
   - Weight change (-)
2. Chest
   - Dyspnea (+)
   - Orthopnea (-)
   - Cough (+)
   - Sputum (-)
   - Chest pain (-)
   - Hemoptysis (-)

Review of system II

3. Abdomen

Loss of appetite(-)

Nausea (-)

Vomiting (-)

Dysphagia (-)

Abdominal pain (-)

4. Genitourinary tract

Hematuria (-)

5. Back & Extremities

Edema (-)

Back pain (-)

Physical examination I

1. Vital sign

BP 120/80mmHg PR 68 회/분

BT 36.6 ℃ RR 20회/분

2. General appearance

Not so ill-looking appearance with alert mental status

Physical examination II

3. HEENT

No pale conjunctivae No dehydrated tongue

No cervical lymph node palpitation

4. Chest

Inspiratory crackles and rhonchi on both lung fields

Regular heart beat without murmur

Physical examination III

5. Abdomen

Soft & flat

Normal bowel sound

Tenderness/Rebound tenderness (-/-)

Organomegaly (-)

6. Back & Extremities

Pretibial pitting edema (-)

CVA tenderness (-)

Laboratory finding

ABGA

7.434- 39.5 – 102.4 – 25.9

CBC	결과	단위	참고치
WBC	8.9	10^3/ul	4.0-10.0
Hemoglobin	12.1	g/dl	13.0-18.0
Hematocrit	36.8	%	38.0-52.0
Neutrophil	47.8	%	40-74
Lymphocyte	15.2	%	19-48
Monocyte	4.3	%	3.4-9
Eosinophil	32.3	%	0-7
Basophil	0.4	%	0-1.5
Platelet count	550	10^3/ul	130-400

Laboratory finding

Chemistry	결과	단위	참고치
Total protein	7.4	g/dl	5.8-8.1
Albumin	3.8	g/dl	3.1-5.2
AST	15	IU/l	0-40
ALT	10	IU/l	0-40
BUN	7.9	mg/dl	8.0-20.0
Creatinine	0.54	mg/dl	0.6-1.2
LDH	230	U/L	106-211
Electrolyte	**결과**	**단위**	**참고치**
Sodium	138	mmol/L	135 - 153
Potassium	4.3	mmol/L	3.5 - 5.3
Chloride	101	mmol/L	99 -115

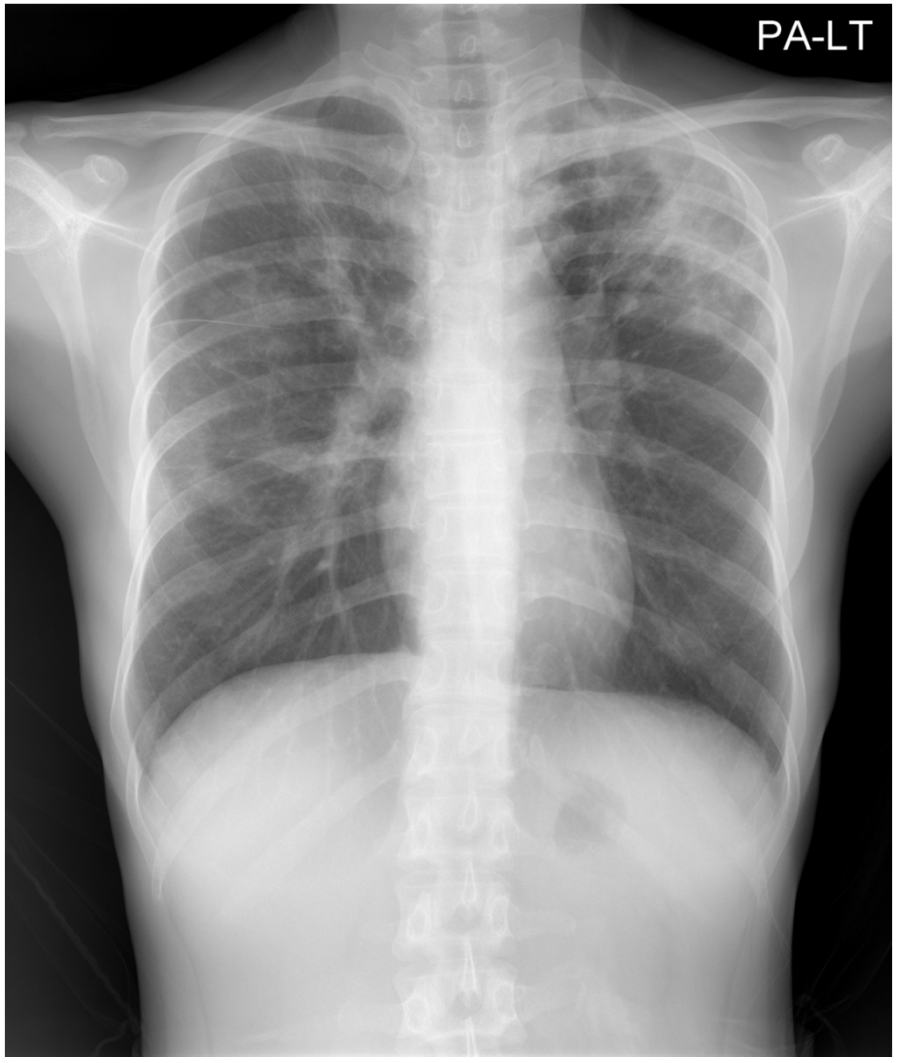
Sputum WBC differential count

총세포수 :	*10^5/ml	
Total cell	2.2	
생존률 :		%
Viability		18.2
Differential	개	%
Macrophage	6	3
Neutrophil	80	40
Eosinophil	90	45
Lymphocyte	0	0
Columnar epithelial.cell	24	12
Squamous epithelial.cell	169	84.5
검체육안소견 :		
검체육안소견	mucoid	

Lung volumes and DLco

Spirometry	reference	measure	% Ref
FVC	3.67	3.03	83
FEV1	2.88	2.46	86
FEV1/FEV%	78	81	
Lung volume			
VC	3.67	3.04	83
TLC	5.13	4.33	84
RV	1.64	1.29	78
DLco	19.8	14.1	71

Chest PA



Problems list

Fatigue, dyspnea on exertion, cough

Abnormal chest x-ray

Crackles, Rhonchi on both lung fields

Impression

known asthma

Tuberculosis, pulmonary

Churg-Strauss syndrome

CEP

COP

Diagnostic plan

Chest CT with enhancement

BAL

Sputum AFB smear and culture

Lung biopsy or nerve biopsy

Radiologic findings

BAL

총세포수 :	*10^4/㎖	
Total cell	150	
생존률 :		%
Viability		86.7
Differential	개	%
Macrophage	210	42
Neutrophil	18	3.6
Eosinophil	267	53.4
Lymphocyte	0	0
Columnar epithelial.cell	5	1
Squamous epithelial.cell	0	0

Sputum for acid-fast bacilli smear & cultures : negative

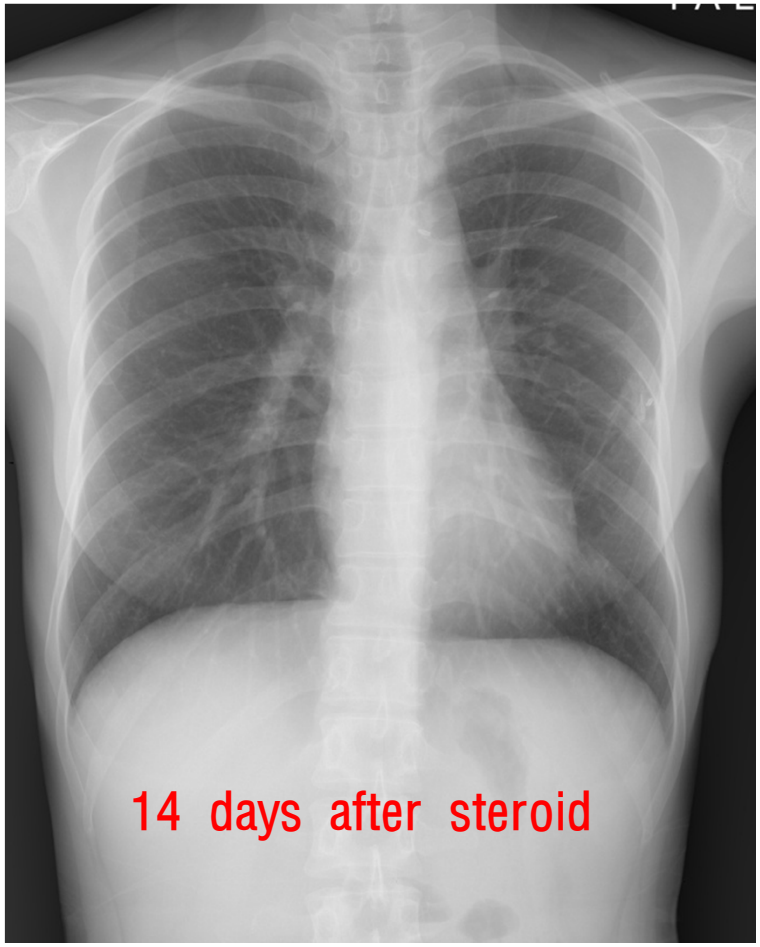
VATS biopsy (LUL, LLL)

병리소견

Diagnosis

Chronic eosinophilic pneumonia

Progress



Chronic eosinophilic pneumonia (CEP)

- Idiopathic pulmonary infiltrates with eosinophilia
- Peripheral eosinophilia : common, absent in 10-20%
- F>M, nonsmokers
- Peak incidence in the 5th decade

- Protracted respiratory syndrome with constitutional symptoms
- Insidious onset : usually > a month duration

Medicine (Baltimore). 1998;77(5):299.

N Eng J Med. 1969;280:787–798.

CEP in Asthmatics

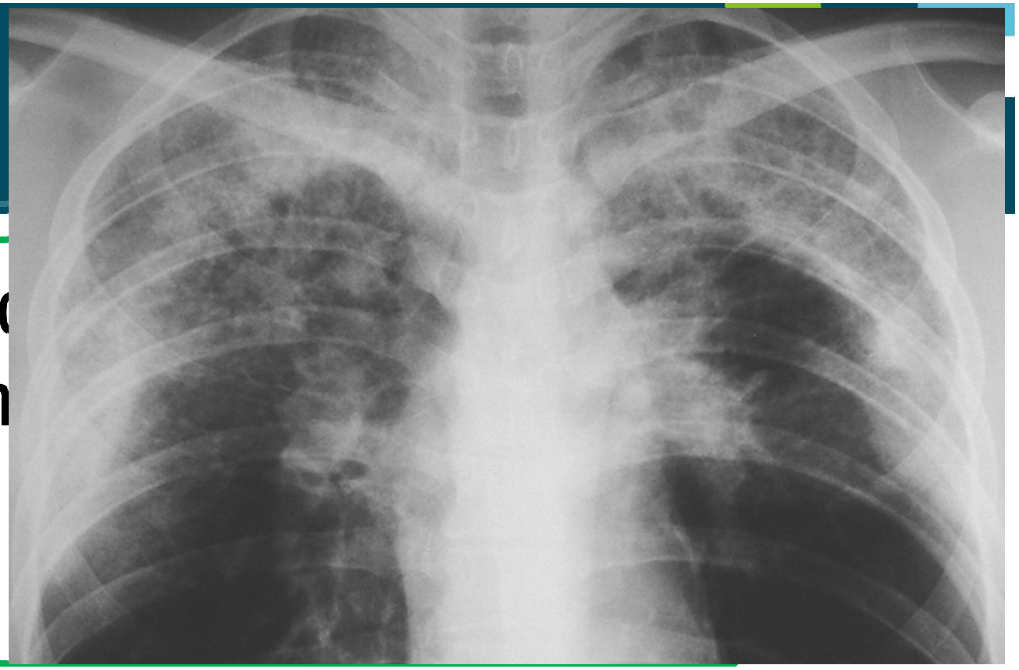
- Asthma accompanies/precedes in 50 %
  → Churg-Strauss disease : one of the top differential diagnosis
- Asthma: not a prerequisite
- 63%: atopic history

- Asthmatics among CEP(vs nonasthmatics)
  -lower frequency of relapse
  (possibly because of a higher use of inhaled corticosteroids)
- CEP in asthmatics
  -often associated with the development of severe asthma

Eur Respir J 2003;22:8–13.

Image findings

- From ground-glass t
- Bilaterally and periph
- predominance in the
  (“photographic negative



- Classic pattern shown ? in 1/4 of Pts

- Upper-lobe infiltrate (30 to 47%)
- Lower-lobe infiltrate (11%)
- Migratory infiltrate (0 to 25%)
- Interlobular septal thickening

Chest. 2008 ;133:1512-6

Diagnosis*

- Proposed the diagnosis of CEP be based on:

1. Respiratory symptoms >2 weeks duration
2. Alveolar eosinophilia (> 25%, especially > 40%) or blood eosinophilia (> 1,000/mm3, especially >1,500/mm3)
3. Pulmonary infiltrates on chest x-ray film, usually peripheral
4. Exclusion of other causes of eosinophilic lung disease

- Most authors do not recommend lung biopsy:
  BAL may be helpful in the diagnosis

Clin Rev Allergy Immunol. 2008;34:367-71.

South Med J. 2007 Jan;100(1):49-53.

Treatment

- Initial treatment

  oral prednisone (0.5 mg/kg/day)

- initial dose: 2 weeks after the complete resolution of symptoms + plain chest radiographic abnormalities

  → tapering(0.25 mg/kg/day) continued for another 8 weeks