Primary Spontaneous Pneumothorax

Case presentations and literature review

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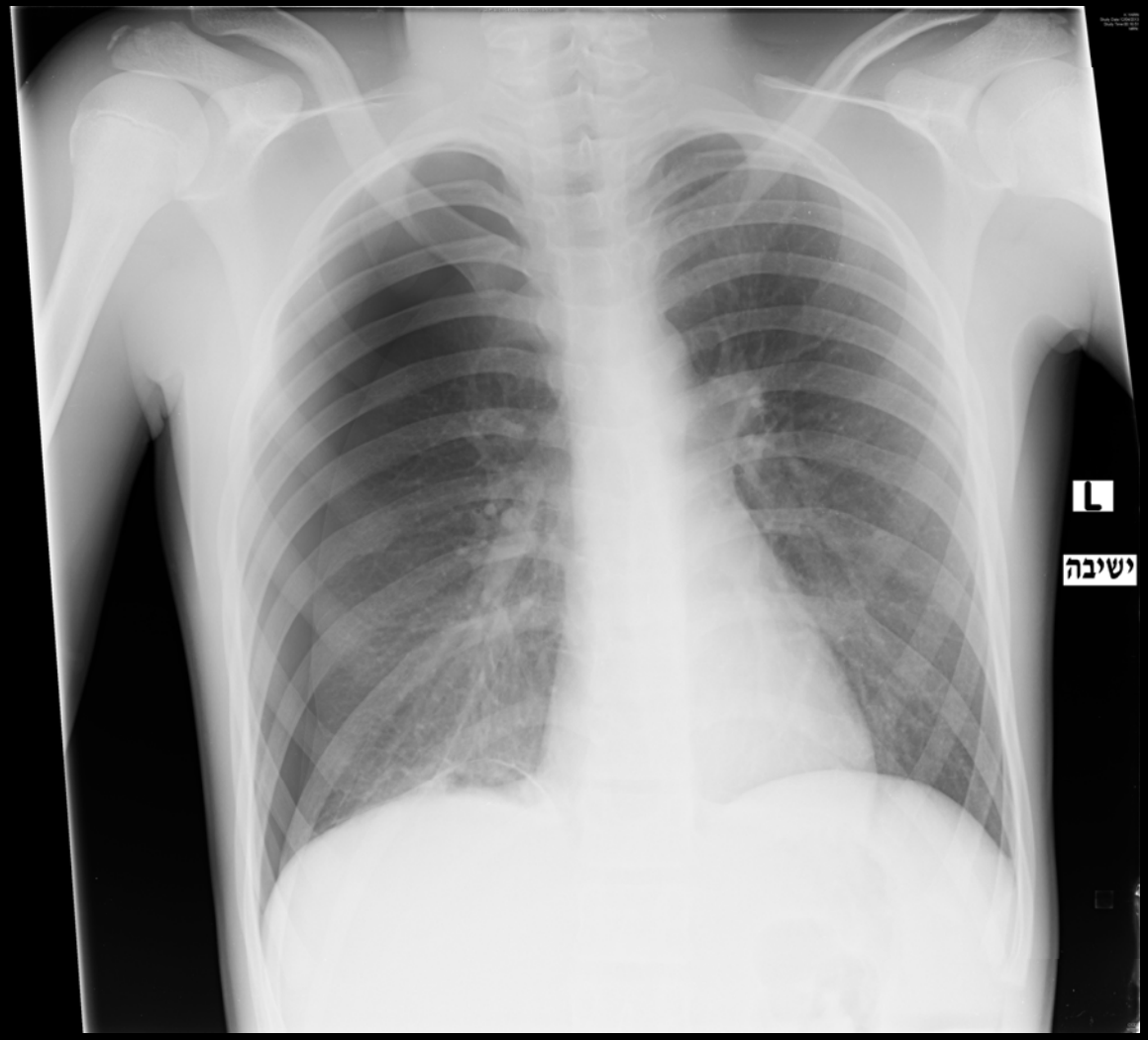
Case presentation #1

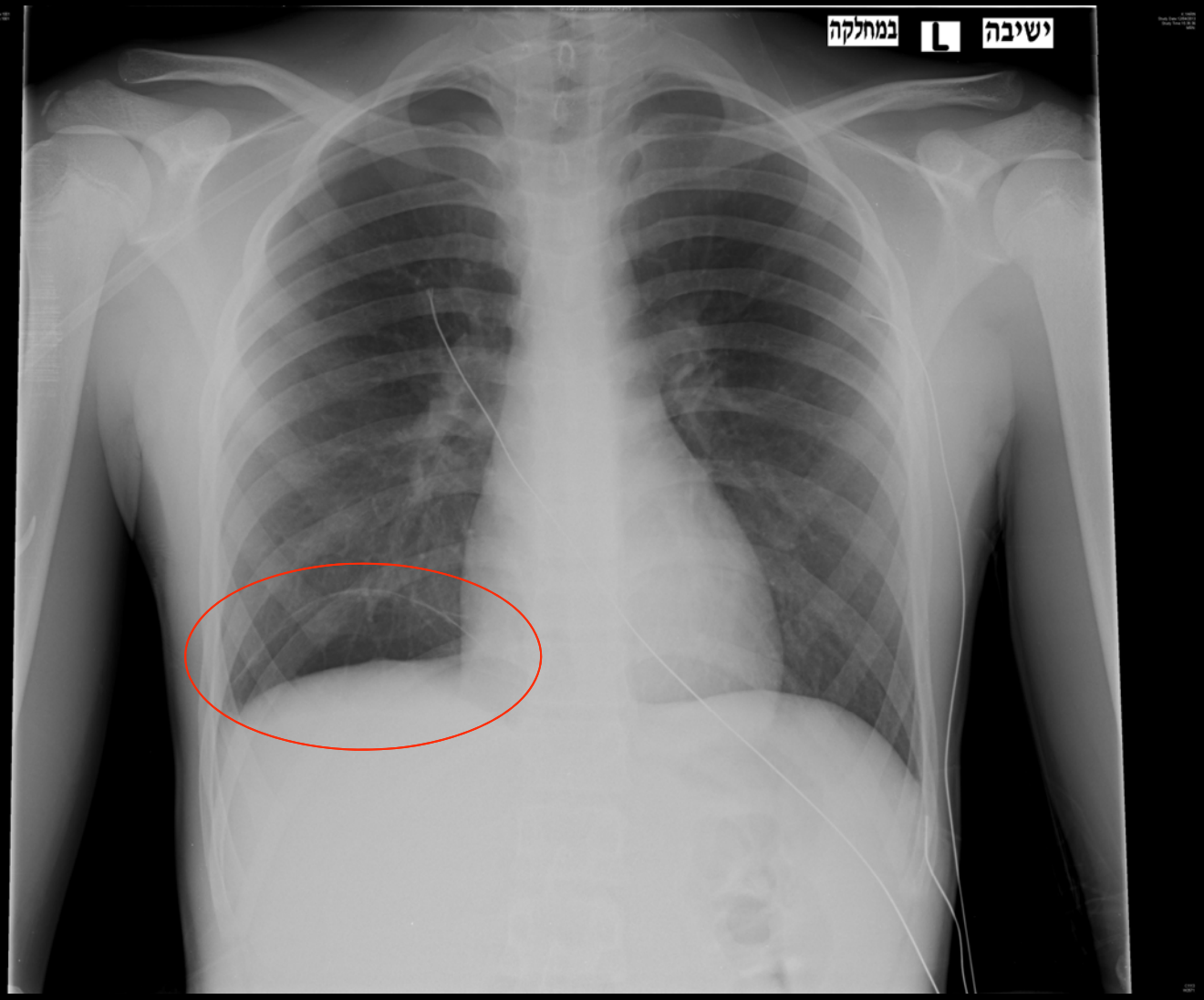
- 14y old male previously healthy
- Weight= 48kg, Height= 165cm
- 1 day Hx: mild shortness of breath and chest pain
- Presented to local ER- no dyspnea, minimal chest pain. CXR→ Rt PTX
- Transferred to our ER

ER CXR

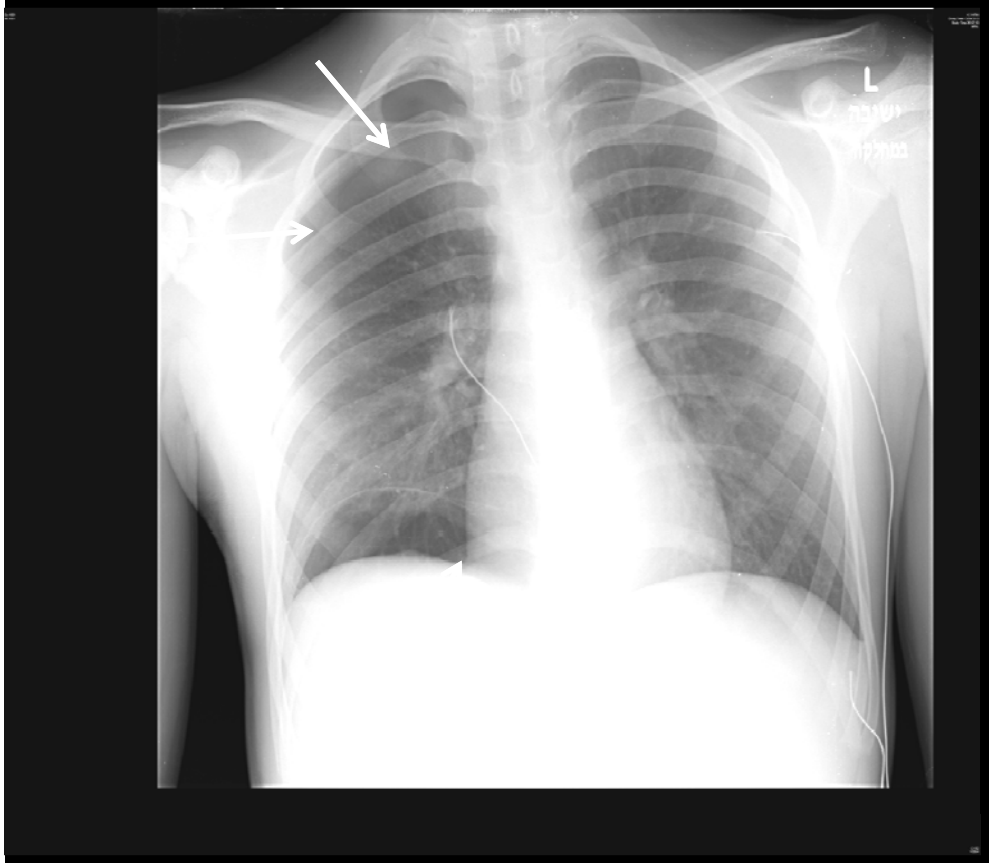


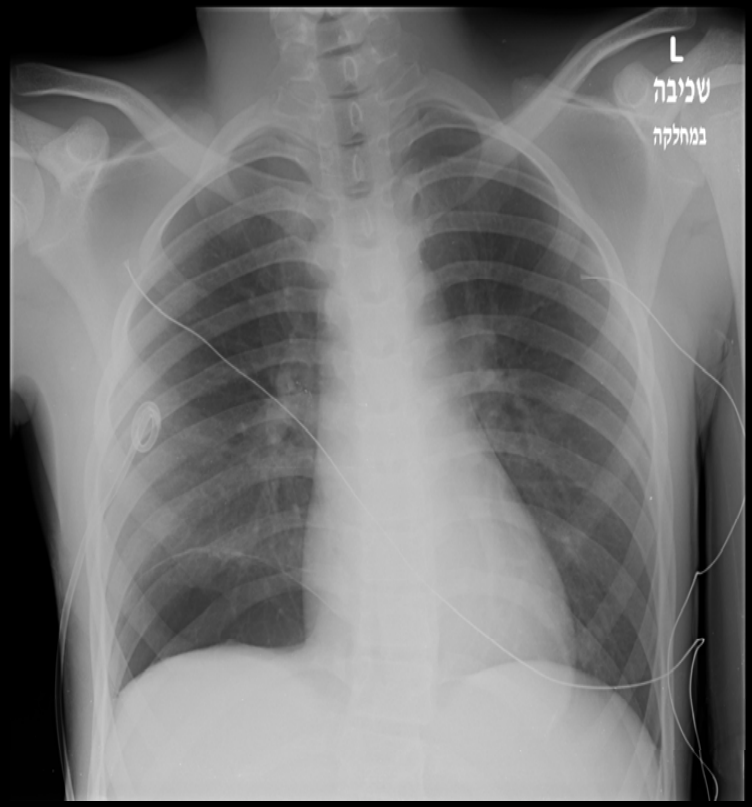
Case presentation 1- c'd

- s/p NA- 950 ml of air



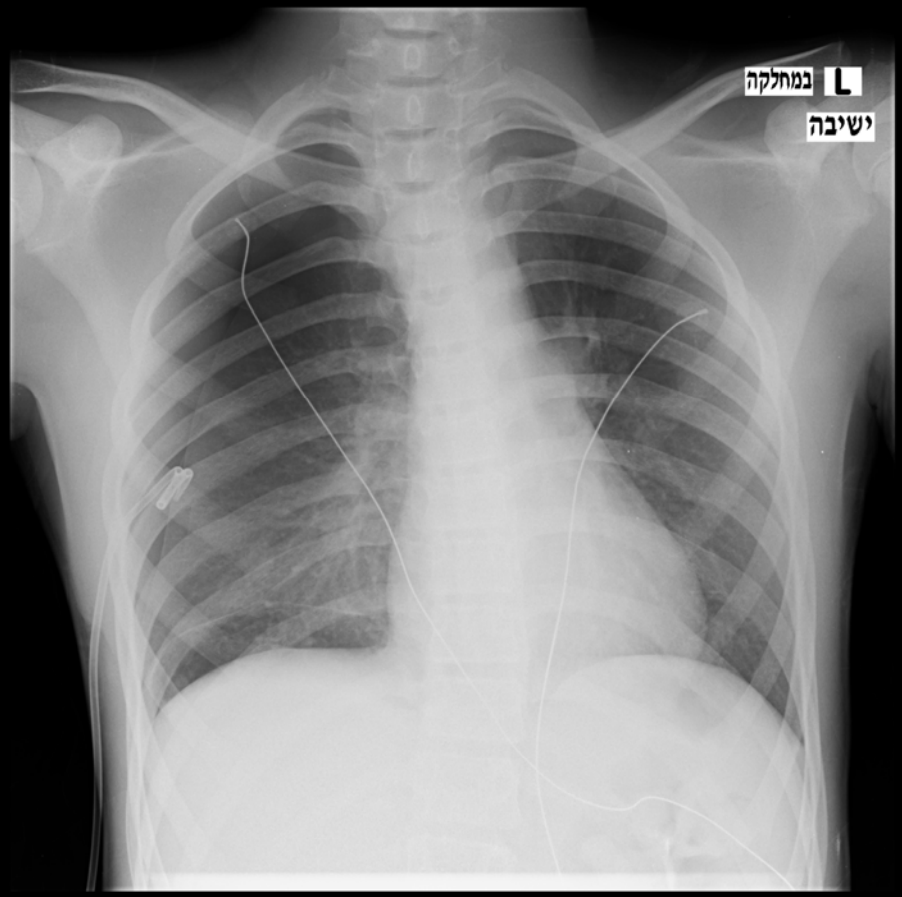
Case presentation 1- c'd





Case 1

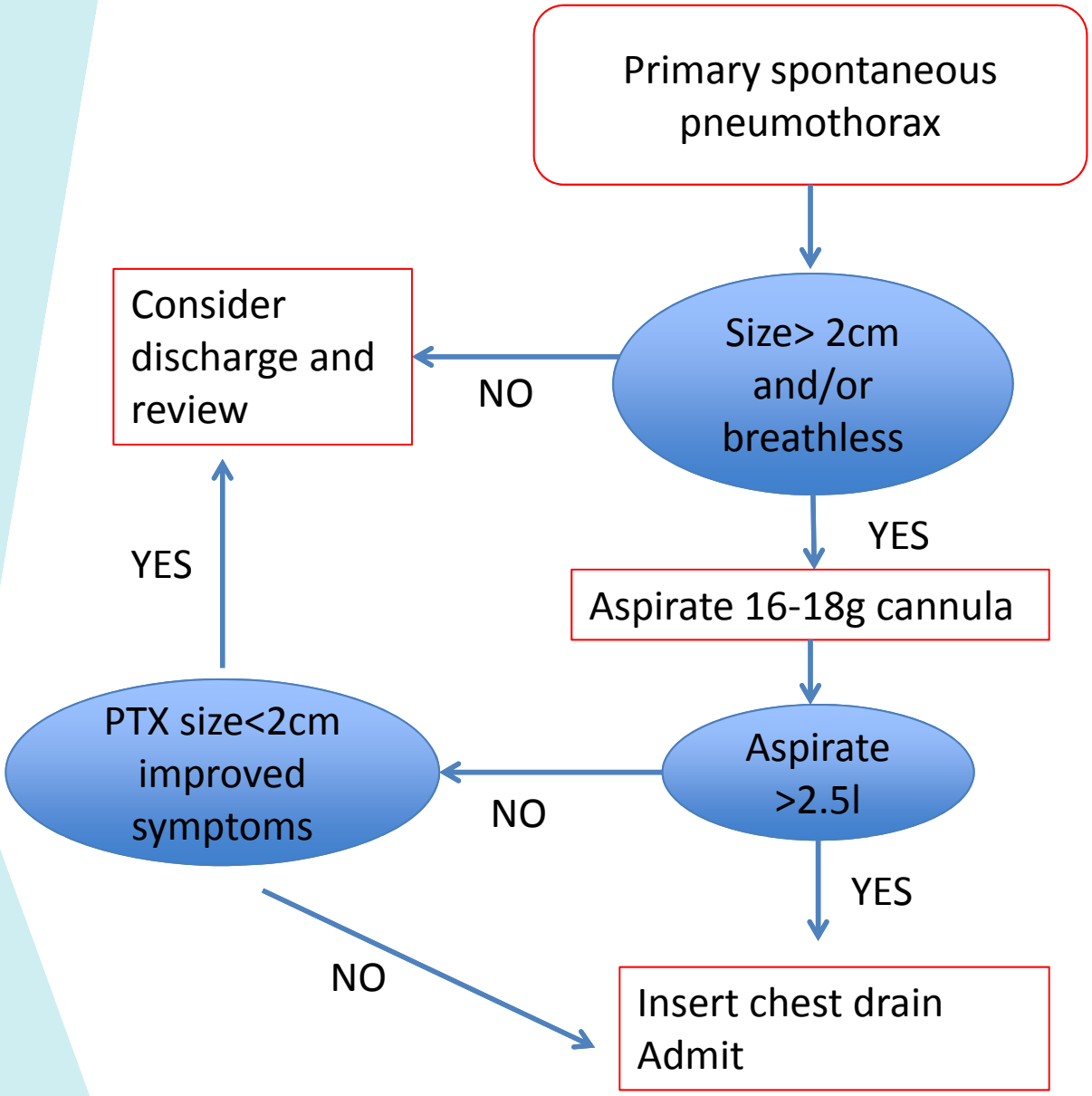
- 4 days post CD- no bubbles- CD off suction



- Suction resumed
- Sub pleural air preventing reexpansion

PSP management

BTS guidelines
Thorax 2010



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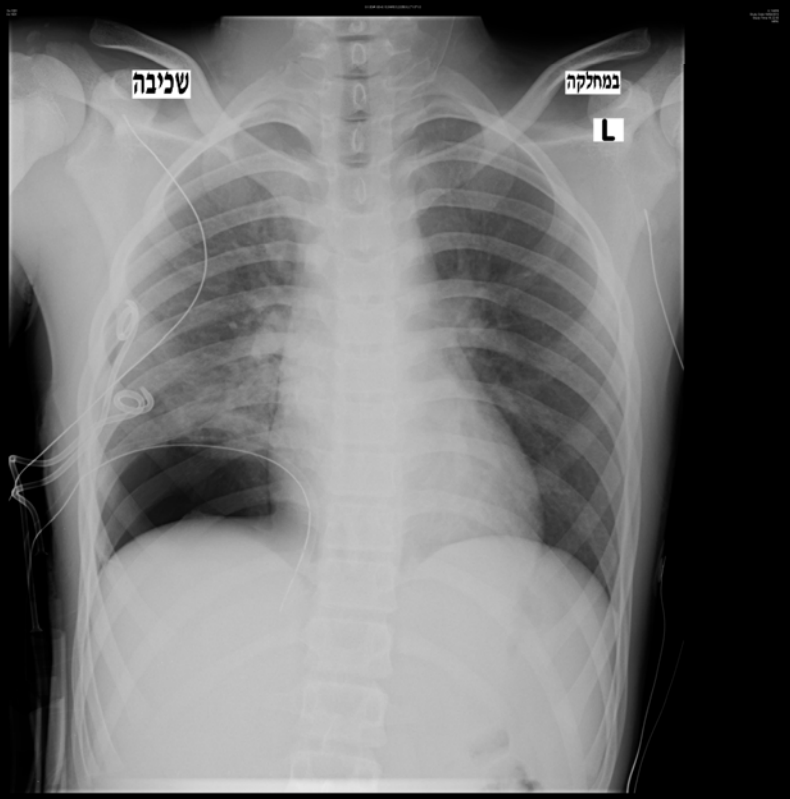
Case 1

- Over the next 3 days- 3 CD- still air leak



What to do next?

Management of air leak

- Up to 20% of PSP- persistent air leak at 48h post CD insertion
- Timing of intervention:
  - Range of monitoring 2-14d
  - ACCP US guidelines: PSP 4d, SSP 5d
  - BTS guidelines: 3-5d

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PSP- the role of CT

- Gold standard for:
  - PTX size and location
  - Location of CD
- Sub-cutaneous emphysema preventing good quality CXR
- Evaluation of persistent air leak, recurrent PTX
  - Underlying lung disease, bullae etc.
- Prior to surgical intervention- delineation of lung ELC.
  - Differentiating large bullae from PTX

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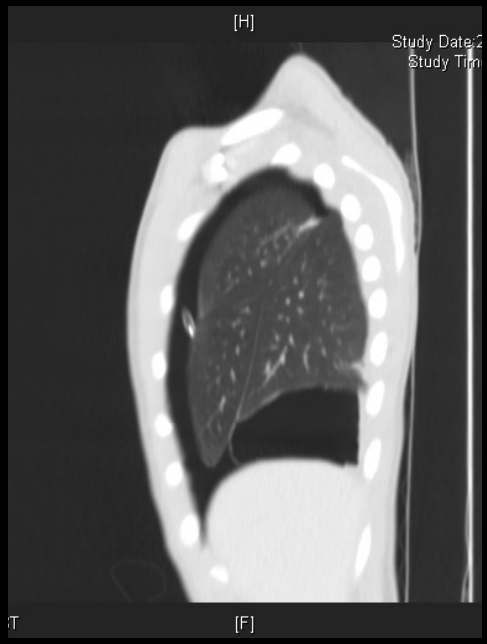
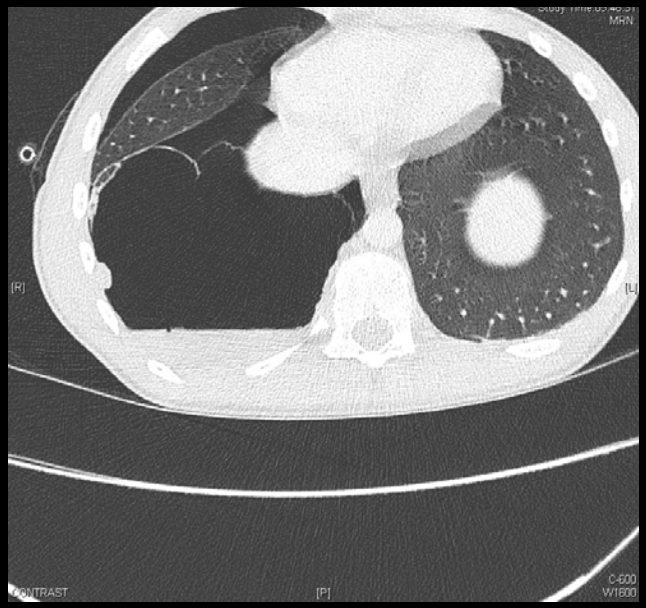
Case 1- Chest CT



Sub-Pulmonic Bulla



PSP- Pleural disease

Table 2. Pathological changes associated with PSP

Pathological abnormality	Description
ELC (blebs/bullae)	Macroscopically visible areas of weakness on visceral pleura Occasionally seen to be the sight of air leak Present in approx. 80% of cases Often bilateral
Fluoroscein-enhanced autofluorescence	Represent areas of pleural/sub-pleural abnormality not visible with white light Often present at sites distinct from ELC in PSP lungs and not in controls Provides evidence of diffuse pleural porosity
Distal airway inflammation Respiratory bronciolitis	Inflammatory infiltration with lymphocytes and macrophages within walls of bronchioles Associated fibrotic changes and compensatory emphysema

*Primary Spontaneous Pneumothorax: A Diffuse Disease of the Pleura .Seamus G et al Thematic Review Series 2012 Respiration 2012;83:185–189

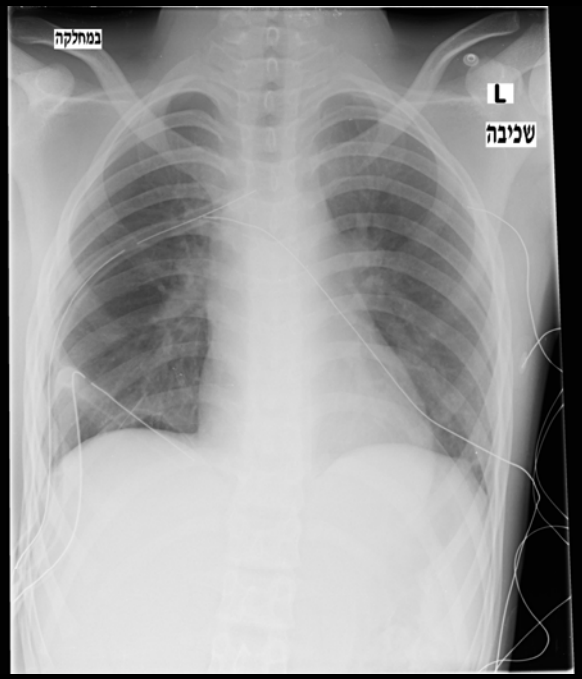
*Fluorescein-enhanced Autofluorescence Thoracoscopy Noppen M et al American Journal of Respiratory and Critical Care Medicine; Jul 1, 2006; 174, 1;

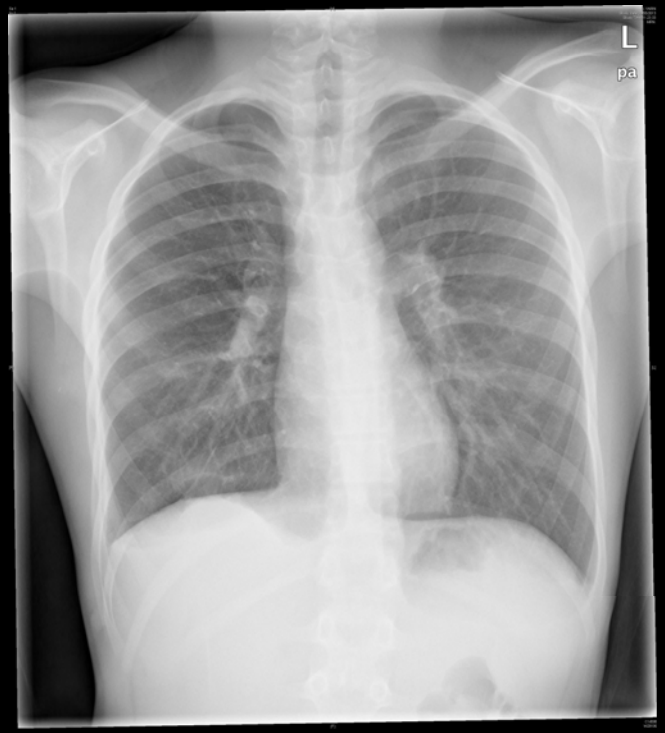
Sub-pulmonic bullae

- Rare location of blebs/bullae
- Most bullae are apical – related to increased ventilation of the lung apex

Case 1

- Underwent uneventful thoracoscopic resection of sub-pulmonary bleb (pathology Dx)
- CD removed on POD 4





Case presentation #2

- 14y old male
- Asthma from 8mon of age
- 3y-7y of age- control meds (inhaled steroids)
- Rec. pneumonia X3 in the previous 3y
- Engaged in intensive physical activity

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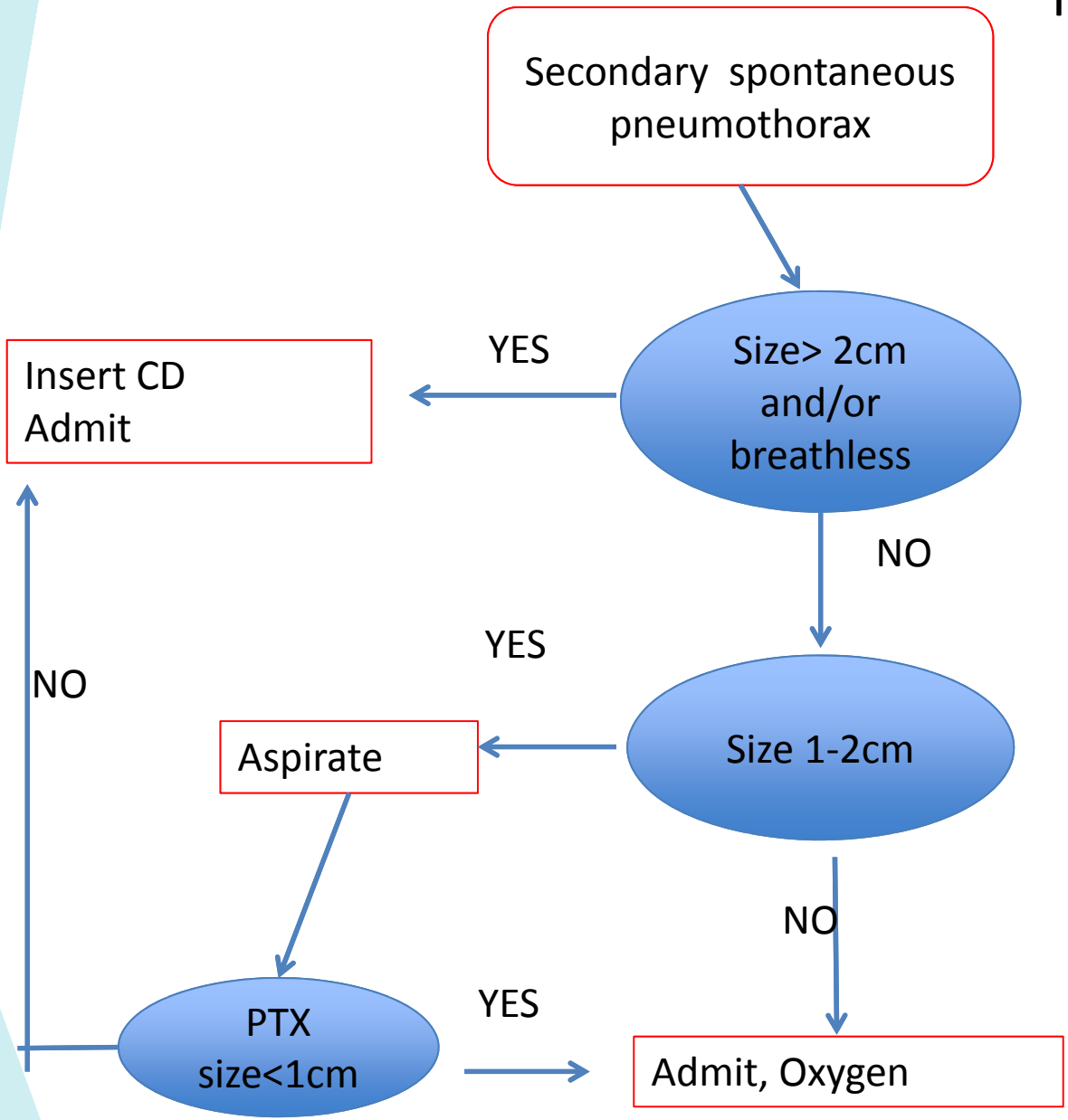
Case 2

- 27/1/13- mild shortness of breath and chest pain

PSP?
SSP?

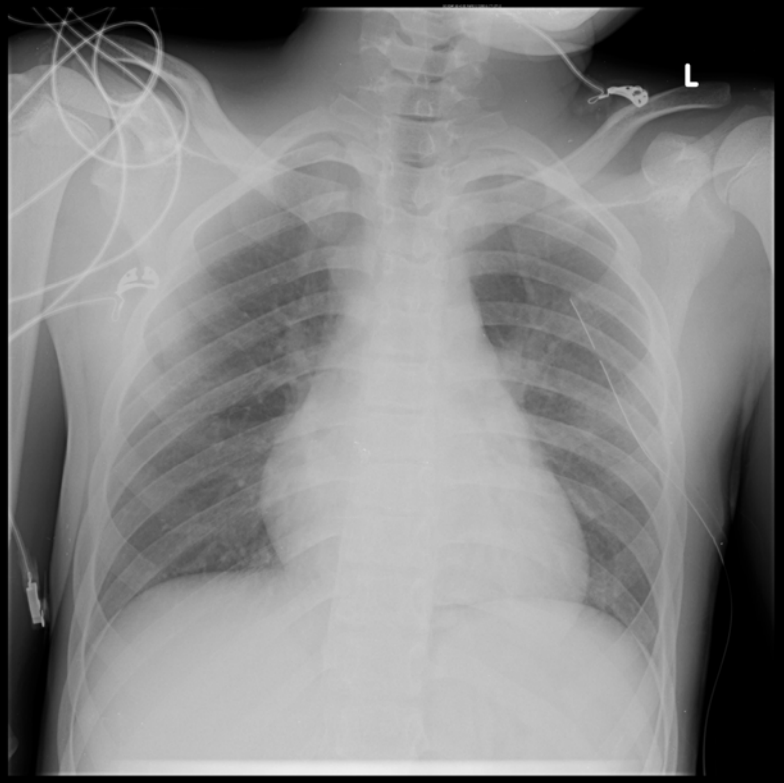
SSP management

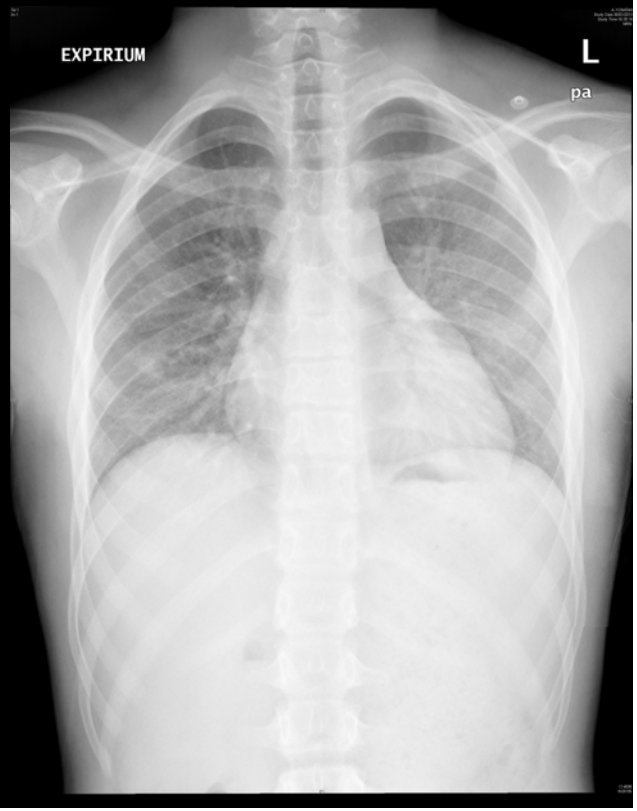
BTS guidelines
Thorax 2010



Case 2

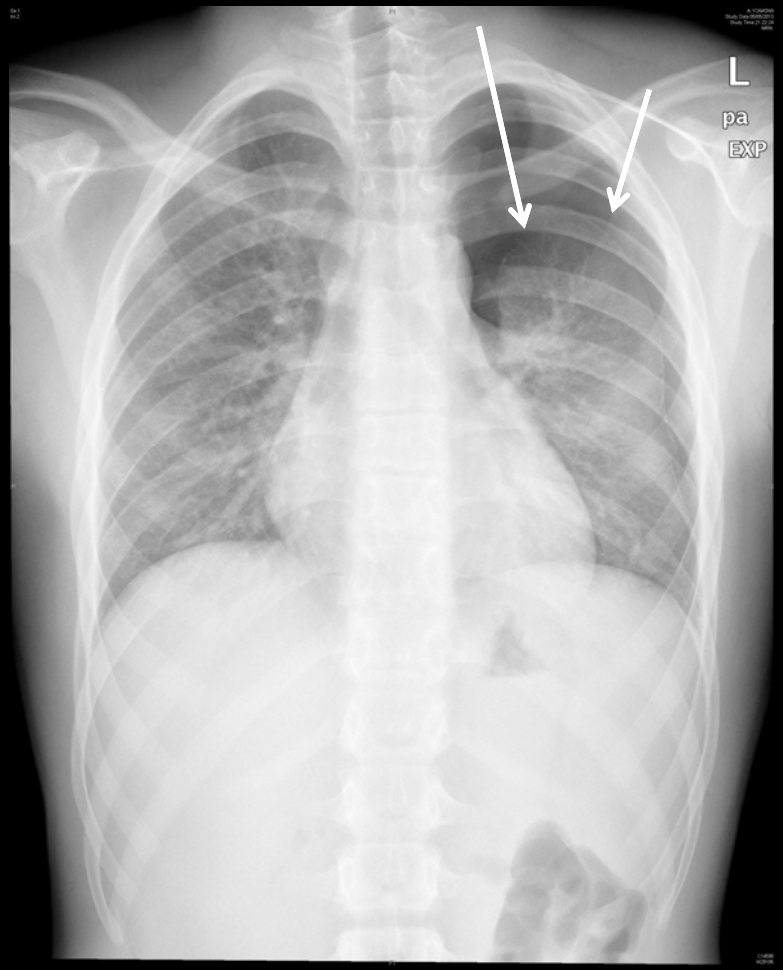
- Treated with CD for 48h- resolution

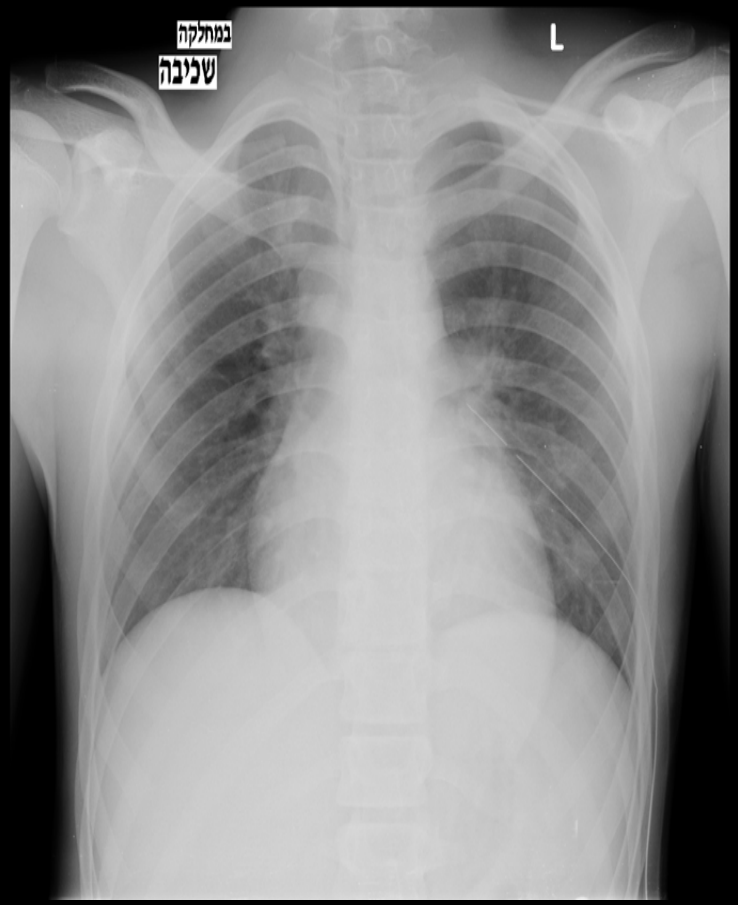




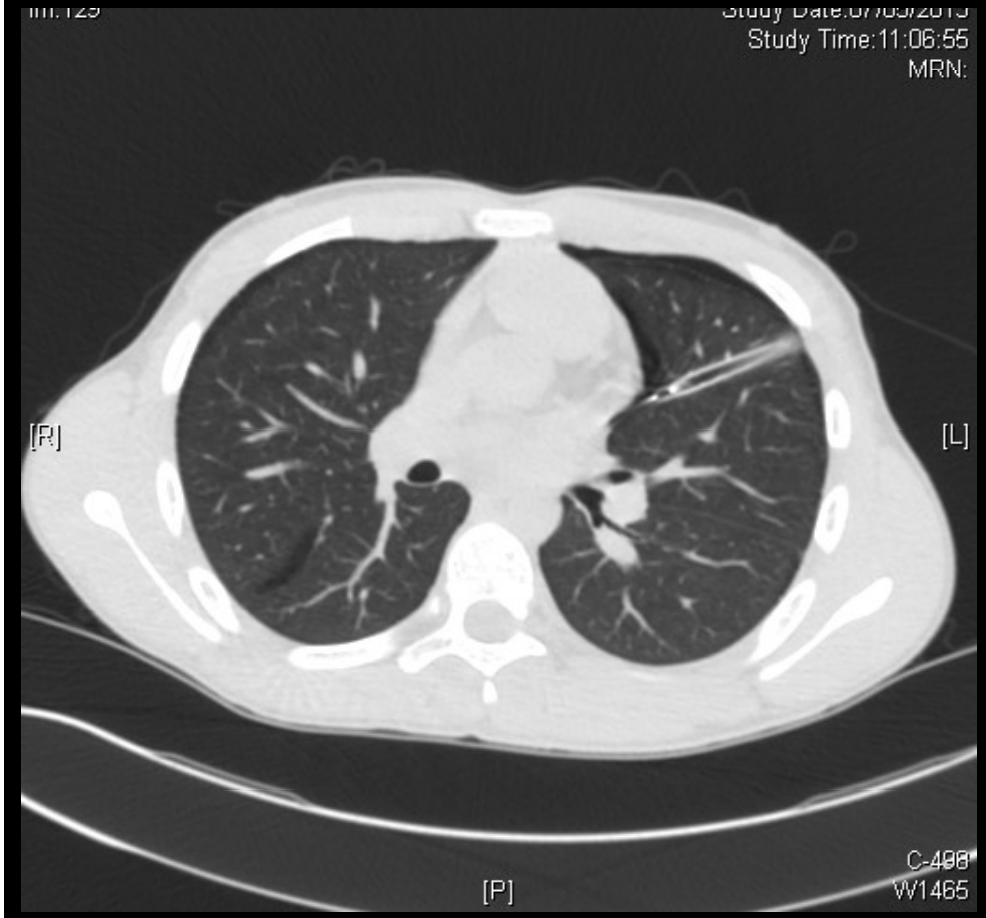
Case 2

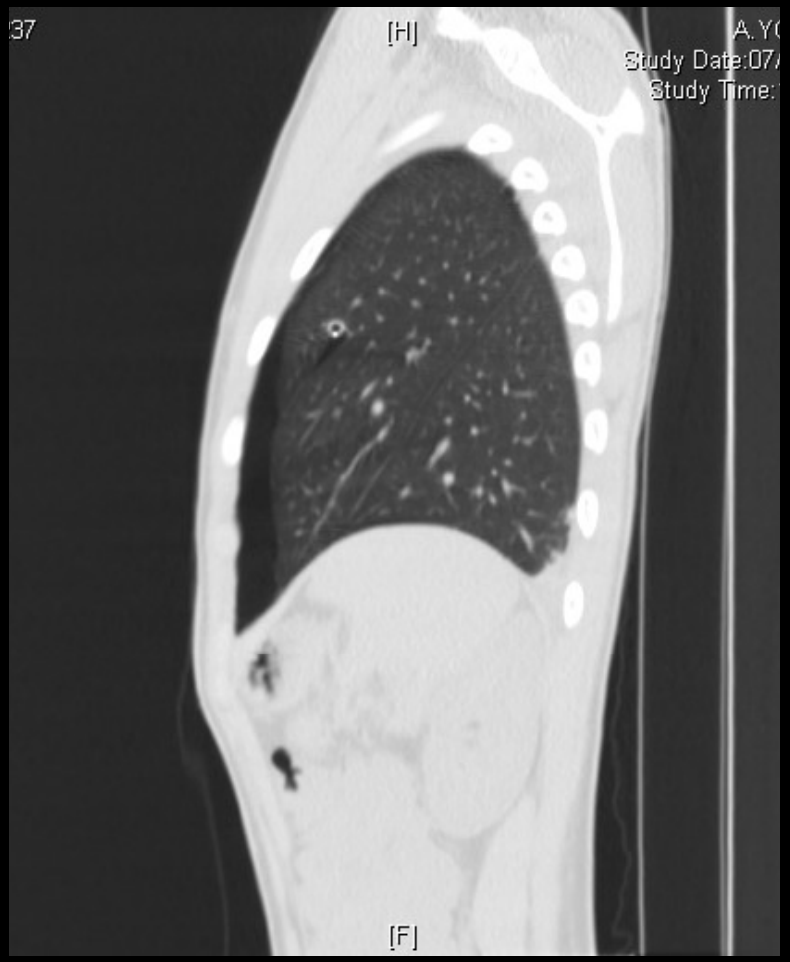
- 5/5/13- recurrence of Lt PTX→ CD→ re-expansion



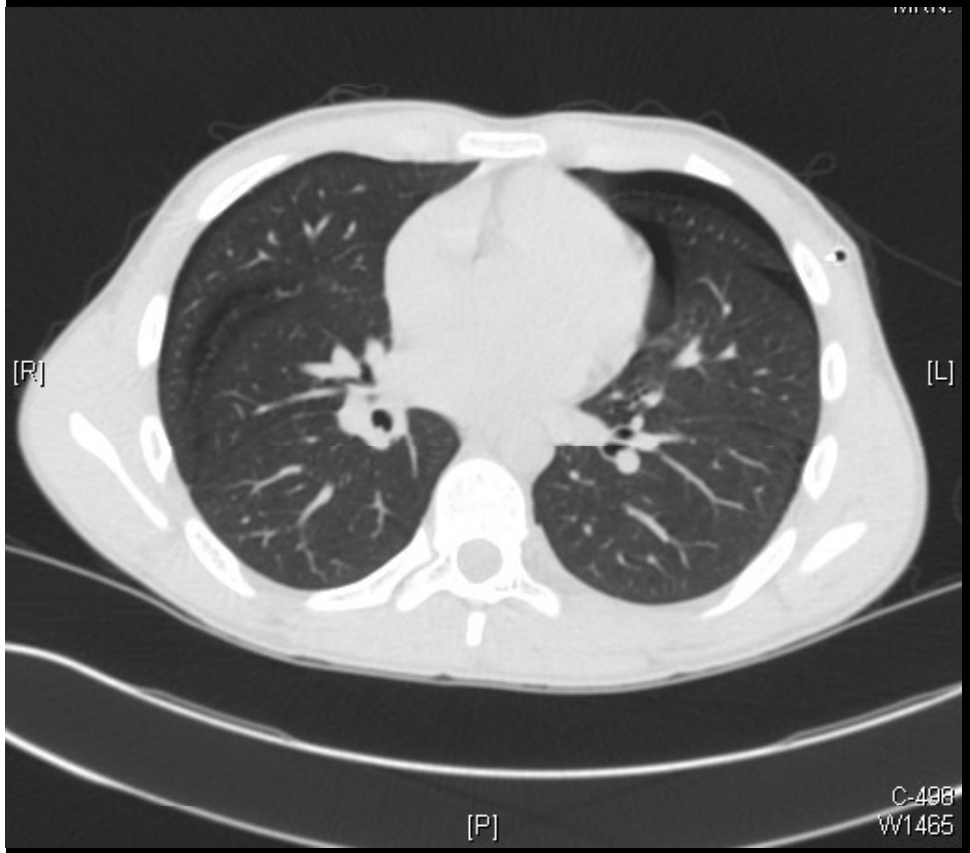


Case 2 – CT





Case 2 –chest CT



Diffuse paraseptal emphysema

Diffuse Paraseptal Emphysema

- Radiological term
- Emphysematuos lung changes located at the lung peripheries
- Tracing the pleural contour into the lung fissures
- Multiple superficial blebs
- Extremely rare

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Case 2

- Suffered a third lt PTX recurrence within a week of CD removal
- Underwent VATS pleurodesis

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Case 2

Case 2

What to do with the Rt lung?

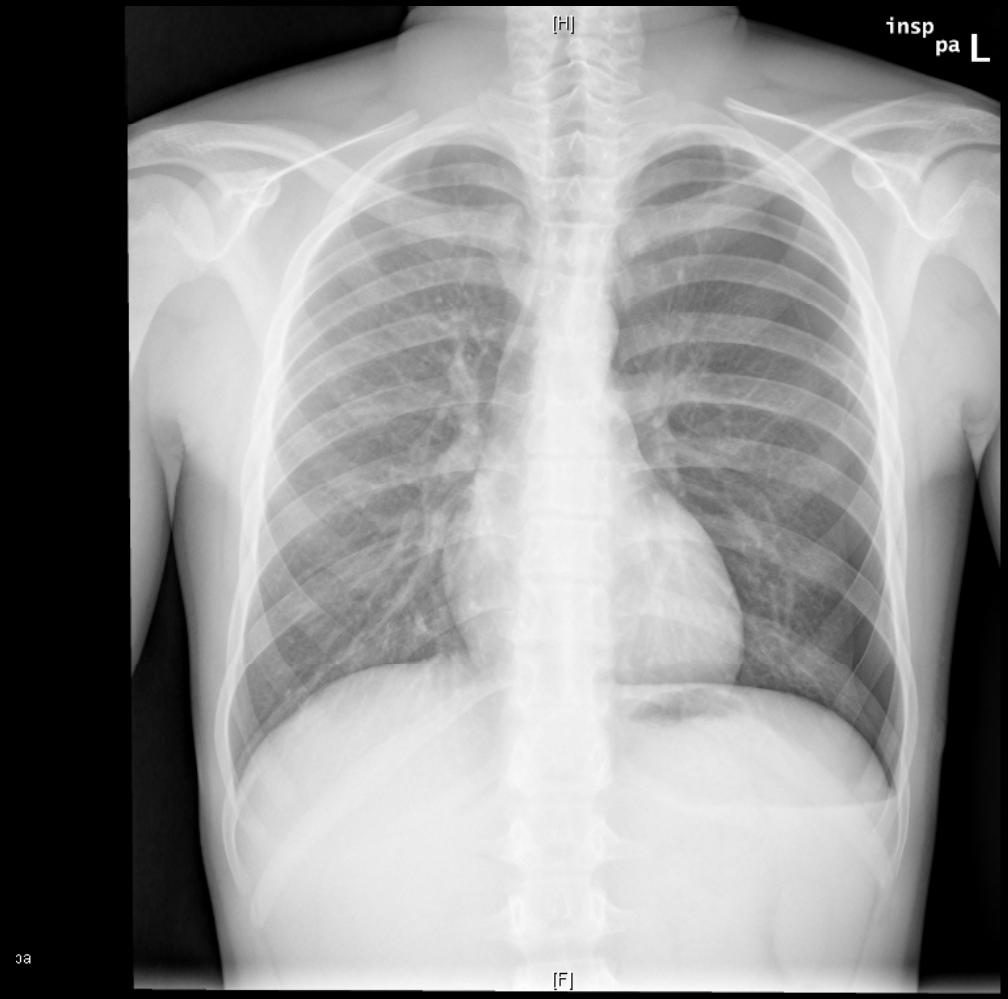
Limitations?

Meanwhile…….

DA

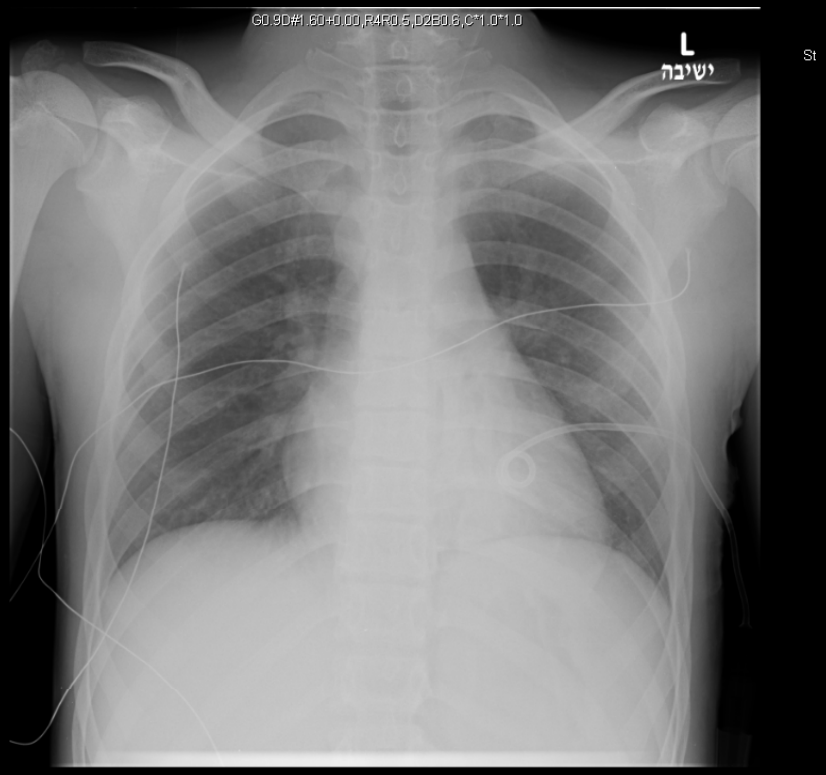
Case 2

- 3 weeks post VATS pleurodesis to Lt lung



Case 2

- Re-expansion after small bore CD- removed after 48h



Case 2

What to do with the Rt lung?

What to do with the Lt lung?

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Contralateral prevention?

- 50%-80% have ELC on HRCT- often bilateral.
- Is ELC related to recurrence?
  - Martinez Ramos et al, Ouanes-Besbes et al- n=135 no association between CT findings and rec. risk
  - Chou et al- preemptive VATS for the contralateral blebs (n=16)reduced rec.rate from 17% (n=35 unilat VATS) to nil.
  - Huang et al- Contralateral recurrence (14 %)of PSP is more common in patients with underweight and ELC in the contralateral lung. Single-stage bilateral surgery may be considered

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Case 2

- The options:
  - Repeat VATS Vs open thoracotomy?
  - Pleurodesis Vs Pleurectomy?
  - Contralateral prevention
    - Pros and cons
    - timing?

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Take home message

- There is no real primary pneumothorax
- Spontaneous pneumothorax reflects a diffuse and sometimes bilateral pleural abnormality.

DA

DA

Keep
calm
and
thank you
for listening