Introduction and advices for users:
CXR interpretation in TB/HIV high burden settings
Clinical and radiological cases for training to positive and
differential diagnosis

Here are collected 144 clinical cases grouped in 12 different chapters. This part is particularly recommended for the physicians and students who have attended to the 5 days course CXR training. It will be for them a very practical complement of the theoretic knowledge they should have acquired during this training course.

At each case the physician will first discover the clinical context and the CXR on the first slide, than the solution or the different diagnosis hypothesis, sometimes the evolution on the following slides. Some slides contain CT scan view. They are present in this presentation only to explain more easily the standard CXR, not to help for diagnosis, because we know that the great majority of the physicians working in TB field in developing countries cannot use this fantastic diagnosis tool.
These cases have been selected not because they are exceptional but, on the contrary because they are the cases of every day for physicians working in TB and lung diseases field. The patients whose clinical story and CXR is exposed in this document come from France, Cambodia, Laos, Tanzania, Rwanda, Togo, and Gabon...

I have voluntarily kept some CXR whose quality was far from perfect, because it is also a daily problem for physicians working isolated in their district hospital or primary health center...I hope, after this training they will be able to recognize when the quality is too bad to make a radiological diagnosis possible and will have the motivation to try to improve the quality of CXR, so important tool in our daily practice.

The final goal is giving to the physician the adequate tools to integrate CXR in his clinical approach of the patient and allow him to make rational diagnosis, even in a poor resource context.
I particularly want to thank:
- Pr Pierre L’Her who has been my nearest partner in this adventure which began in Cambodia many years ago.

- Dr Jan Van den Homberg, Dr Catarina Casalini, Dr Jaffer Dharsee, who have put in practice in Tanzania an ambitious CXR training program which will be an exemple for the other countries. Thanks also to Jan for the several CXR he has selectioned and I have used in the CD
- Dr Martine Toussaint who works so hard in Rwanda for TB program, and allowed me to put this CXR training program in practice in this country for 7 years.

Fondest regards for all the physicians I worked with during my medical missions, and particularly
Dr Diu et Thang, Cantho Vietnam
Dr Phanita, Dr Chumm In, Dr Peou Setha, Cambodia
Dr Louise Khalisa, Dr Michel Gassana, Dr Louise King, Rwanda

The 11/12/ 2013
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Chapter one
Man, heavy smoker, hemoptysis, weight loss and left thoracic pain.
Left opacity, silhouette sign with cardiac edge with anterior overlap of the left hilus: the opacity is anterior. This opacity is also retractile: notice the ascension of the left diaphragm and the loss of volume of the left lung: it is an atelectasis of the upper left lobe; probable bronchial cancer in this clinical context.
Man, 28 years old, mild fever and hemoptoïc sputum. HIV negative. Repeted AFB negative in sputum.
The aspect and localisation of this retroclavicular infiltrate is highly indicative of TB with negative microscopy (the culture is positive in this case)
18 years old woman. Fever cough and worsening condition (piercing on the right nipple...)
Typical picture of miliary. AFB positive in sputum. HIV neg. Probable right hilar and sub carena adenopathy
Scan view of the previous case. Notice hilar and mediastinum adenopathies, not well visible on the CXR.
Acute onset with fever, and purulent sputum and right thoracic pain.
Middle lobe pneumonia. Notice the superior edge of the opacity which is very well limited by the small fissura: Acute middle lobe pneumonia. Probable pneumococcic infection.
Man, 22 years old, cough, hemoptoïc sputum
CXR: cavity in the upper left lobe (red arrow) associated with homolateral and controlateral nodules (yellow arrows). The association of lesions of different seniority, is highly indicative of TB. AFB positive in sputum: TB cavity of the left upper lobe.
Previous case, scan view
Woman, 23 years old, fever and weight loss. No cough, no respiratory symptoms.

Her husband has been recently treated for TB.
CXR: Notice the enlargement of mediastinum just in the right latero tracheal area: the chest ray and the clinical context highly suggests **TB adenopathies**.
Scanographic view of the previous case. The arrows show the adenopathies.
Anterior thoracic pain with increasing dyspnea for few days. No cough. Decrease of cardiac sounds.

Courtesy Dr Van den Homberg-Tanzania
Enlargement of cardiac silhouette. Notice the symmetry of the 2 edges of the heart in their superior part. No sign of alveolar oedema neither left cardiac failure. The most likely diagnosis is pericardial effusion.

Diagnosis is easily confirmed with trans thoracic echography.

Courtesy Dr Van den Homberg-Tanzania
Woman, 40 years old, asthenia weight loss, cough and left thoracic pain for few weeks. No sputum available.

Courtesy Dr Van Den Homberg
Left pleural effusion. Notice the « pushing back » of the mediastinum. Probable left hilar and mediastinal adenopathies. Notice that aortic arch and descending aorta are not visible (contact with adenopathies?) . Bilateral diffuse nodules visible in the lung field. Probable TB. HIV context?. But carcinomatous miliary with metastatic pleural effusion is also possible. Cytology and pleural biopsy is essential for diagnosis.

Courtesy Dr Van Den Homberg
Case 9

Chronic cough and exercise dyspnea
Bilateral opacities in the apex fields. Notice the pleural thickness in contact with the opacities, which are non homogenous and retracted: retraction of the left hilus which is ascended. **Probable TB sequella.** Of course sputums must be analysed for AFB, before the diagnosis of TB inactive sequella.
Man 48 years old, hemoptisy. Light fever, normal examination. Past familial history of TB.
Man 48 years old, hemoptysis. Light fever, normal examination. Past familial history of TB

left retroclavicular infiltrate, suggesting TB infiltrate
Small infiltrate in the right apex well visible on PA view
Man, smoker, repeated bronchial infections for years. No AFB in sputum
Typical bronchiectasis of the right inferior lobe. Probable TB sequela
Case N°12

Man, 35 years old, HIV context, worsening condition and non productive cough. Fever and dyspnea.
Bilateral pneumonia process, associated with mediastinal adenopathy (latero tracheal area). Tuberculosis is highly probable in this context of HIV infection (association of bilateral pneumonia with mediastinal adenopathies).
Chapter 2
Case 1

Man, cough and fever, with weight loss and worsening condition.

Dr Jan Van Homberg -Tanzania
Atelectasis of the right superior lobe: retracted and systematised opacity with ascending position of the small fissura. This atelectasis is associated with a cavity. Nodules and infiltrate in the right inferior lobe and in the middle of the left lung. The association of atelectasis, cavity and nodules (lesions of different seniority) strongly suggests TB (AFB positive in sputum)

Dr Jan Van Homberg -Tanzania
Woman, 80 years old, long past history of smoking, right thoracic pain and cough.
Chest X ray: round homogenous opacity in the right superior lobe with ascension of the small fissura (blue arrow), suggesting atelectasis. The association of an isolated round opacity with atelectasy strongly suggests **bronchial cancer**. No cavity in this bulky mass, which nearly exclude the diagnosis of TB (see the difference with previous case).
Scan view of the previous case
Endoscopic view of the previous case: obstruction of the right superior bronchus by bronchial carcinoma
Case 3

Woman, 27 years old, mild fever and asthenia. TB in the household. AFB negative in sputum.
Woman, 27 years old, mild fever and asthenia. TB in the household. AFB negative in sputum.

CXR: infiltrate in the upper right lobe in the retro clavicular area: **Tuberculosis** of the upper lobe with negative microscopy.
Magnified view of the previous case. If hesitation, compare right and left side and ask for a antero posterior hyper lordotic position. This special incidence put the clavicles out of pulmonary areas.
After Tb treatment
Man, cough and fever. No improvement with amoxicillin. Do you prescribe TB treatment?

- Cambodian National TB control program
Culture for BK is positive. TB treatment is required
Man, 30 years old, HIV+, asthenia and dyspnea. Worsening condition. No sputum available, because of extreme weakness.
Bilateral alveolar opacities: non homogenous, not well limited. Aeric bronchogramm. Notice the enlargement of superior mediastinum (red arrow) which suggests right latero tracheal adenopathies. The association of bilateral pneumonia with mediastinal adenopathies is indicative of TB in HIV context.
quick onset: high fever, acute thoracic paint, cough and sputum
Typical alveolar opacity of the left inferior lobe:
Not homogenous, not well limited, with aeric bronchogram: it is an alveolar opacity. This opacity is posterior because negative silhouette sign with cardiac edge which is well visible.
Final diagnosis is right inferior lobe pneumonia. This Chest X ray strongly suggests acute pneumococic lobar pneumonia in this clinical context.

Courtesy Dr van den Homberg- Tanzania
Abundant and repeated hemoptysis. Past history of TB 10 years ago, with nine months treatment. No AFB in sputum.
CXR: right retro-clavicular opacity, with small cavity on the top looking like moon crescent: this strongly suggests aspergilloma developping in old tb sequella cavity
Enlarged view of the previous case
Man, long past history of bronchial repeated infections, morning chronic abundant expectoration, and exercise dyspnea.
Chest X ray: several round cavities, with fine or thicker limits in the inferior lobe. Repeted AFB in sputum are negative. Typical aspect of **bronchiectasis**.
Case 9

Man, 48 years old, Cambodian farmer productive cough thoracic paint for 30 days. No improvement with antibiotic (amoxi than ceftriaxone). Sputum negative for AFB.
Excavated left pneumonia It could be:

- Tuberculous pneumonia (but AFB neg)
- Staphylococcic pneumonia
- Gram neg or anaerobic pneumonia
- Meilodosis (infection due to Burkholderia pseudomalleï)

Meiloidosis!
Meiloïdosis

• Not so rare in south east Asia (particularly in Lao and Thaïland)
• Predisposing factors: diabetes, alcohol excess, chronic lung diseases, seroïd thérapy…
• Others possible localisations: skin, spleen, liver, kidney, parotid, brain
• Different possible présentaion CXR: Infiltrate, pneumonia , cavited pneumonia, ards.
Meiloïdosis
Meiloïdosis
Meiloidosis: difficult treatment

• Initial intensive therapy: ceftazidime (50mg per kg) + cotrimoxazole 8/40 per kg every 12 hours ): minimum 14 days

• Maintenance cotrim idem +/- doxycyclin 100 mg twice a day 3 monthhes minimum
Case 10

Man, 46 years old. No respiratory signs but cervical swelling. Punction: purulent content with few AFB bacilli
Bilateral hilar tuberculous adenopathies
Previous patient on the left side. Normal hilus on the right side. Notice the overlap sign of the right hilus because of hilar adenopathies overlapping pulmonary artery.
Case N° 11

Repeted bronchial infections with abundant ans sometimes purulent sputum.
AFB neg
Bilateral bronchiectasis
Active case finding in jail, Laos 2015. Patient with non-productive cough and small weight loss. AFB negative in sputum. Do you prescribe TB treatment?
Small left axillary infiltrate in under pleural area. It is associated with left hilar adenopathy in aorto pulmonary window. This association is highly suggestive of TB. TB treatment is required.
Chapter 3
Man 72 years old. Long past history of non productive cough, increasing dyspnea and progressive weight loss. AFB negative in sputum. No improvement with several antibiotic treatments.
Chest X ray; diffused nodules in the right lung, which is retracted. Notice mediastinum enlargement with probable adenopathies in the hilar and right latero-tracheal area. The clinical context, and the association of diffused nodules, adenopathies and retraction suggests tuberculosis. But one possible differential diagnosis is cancer with carcinomatous lymphangitis. Bronchial aspiration by endoscopy was positive for AFB...
Scannographic view of the previous case: mediastinum adenopathies (red arrows), and tuberculous lesions (yellow arrows)
Case 2

Young woman of 18 years old, chronic exercise dyspnea and cough. Abnormalities of cardiac auscultation.
Chest X-ray: typical «mitral silhouette» with dilatation of the left middle arch of mediatinum silhouette, dilatation of the left atrium, vascular hilar hypertrophy and perihilar blur, suggesting post-capillary HTAP. Mitral stenosis. Diagnosis must be confirmed by cardiac echography which is the main way for diagnosis and cardiac surgery indication.
Man 46 years old, cough and exercise dyspnea, tachycardia, and past history of anterior thoracic pain.

ECG: myocardial ischemic signs. Auscultation: crepitant rales.
CXR: cardiomegaly with left ventricle enlargement. Encysted pleural effusion in the minor fissura (frequent in case of cardiac failure). Enlargement of pulmonary arteries and alveolar diffuse pictures, with perihilar predominance: **Acute left cardiac failure, with alveolar oedema, in cardiac ischemic context.**
Same patient after treatment: diuretic TNT and CEI. Notice the cardiac and left ventricle enlargement and the 2 right scissura well visible on the lateral view.
Dyspnea and cough. Right thoracic paint. AFB in sputum not yet available

Courtesy Dr Van Den Homberg
Tanzania
CXR: Right abundant pleural effusion. Notice the typical concave aspect of the superior edge of the opacity (yellow arrows). Nodular infiltrate of the left superior lobe with cavity (red arrow). Tuberculosis is highly probable. The AFB should be positive in sputum because of the left cavity full of tb bacilli in communication with airways. Pleural punction is necessary for analysis (confirmation of serofibrinous exsudative and lymphocitic reaction) and evacuation of the fluid for prevention of pleural sequela.
Dyspnea and cough. Right thoracic pain, with disappearance of pulmonary sounds, on the right side. Past history of smoking.
Chest X ray: abundant right pleural effusion. Notice the attraction of the heart and trachea on the same side than the pleural effusion, suggesting underlying atelectasis. Also notice a right mass visible in the pulmonary area, above the pleural effusion. Lymphocitic exsudative fluid.
Final diagnosis is not TB. **Bronchial cancer with pleural extension and underlying atelectasis**
Young man, 24 years old. Living with a friend who has been treated for TB. Slight fever and cough. No AFB in sputum. Do you prescribe TB treatment?
Chest X ray: few nodules in the right axillary area: probable tuberculous infiltrate
CXR: Typical **TB infiltrate** of the right axillary area. In such Tb lesions with no cavities, there is no AFB in sputum, because not many bacilli in the Tb nodular lesions. But culture (or gene xpert) could be positive. Without TB treatment, there is a very high risk of developing severe TB lesions in the future (between 10 and 20% of risk).
Previous case before treatment (left cxr) and after TB treatment (right cxr): very few sequellae
Woman 40 years old, no medical past history, fever and chills with quick onset.
CXR: right superior acute lobar pneumonia and left inferior pneumonia with pleural effusion. Notice on the lateral view the disappearance of the left diaphragm (positive silhouette sign with pneumonia and pleural effusion). Acute infectious non TB pneumonia is the most probable diagnosis, and antibiotic treatment must be quickly initiated (amoxicillin). In an other clinical context (sub acute or chronic evolution, HIV positive, no improvement with amoxicillin,) one should consider tuberculous pneumonia diagnosis.
No improvement after antibiotic treatment: increase of the left pleural effusion.

Even if antibiotic is adapted to the pathological germ, the clinical evolution can be pejorative in case of purulent associated pleural effusion.
Scan view of the previous case: encysted purulent pleural effusion
Improvement after thoracic drainage
Case 8

Dyspnea, cough, AFB negative in sputum. Past history of TB 6 years ago with treatment. No information about treatment duration and modality.
This chest X ray suggests TB sequellaes: retractile right pleural thickness (no fluid observed at echography) calcified nodule, calcified bilateral hilar nodes, and repeated negative sputums. No need of retreatment.
M 56 years old diabetic but no compliance to treatment, alcoholism and worsening condition, t° 38°5, Cough and abundant sputum for 2 weeks

ABF neg – x3

TB treatment?
No! It is probably Staphylococcic pneumonia in a diabetic patient.
Fever and weight loss. No respiratory symptoms
Small infiltrate in the right apex well visible on PA view. Notice the difference between righty and left apex.
Man, cough, fever and weight loss. No improvement after 10 days of amoxicillin. Sputum negative. Do you prescribe tb treatment?
Middle lobe pneumonia and right latero tracheal adenopathy. The association is highly suggestive of TB. (In this case culture is positive.)
active case finding in jail  Laos 2015.
No information about clinical status
enlargment of the right hilus with convexity of the external edge and overlap of the vascular pictures: Adenopathies TB adenopathies is the most probable diagnosis in a high tb incidence country