Differential Diagnosis of Chronic Pulmonary Diseases

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Introduction

Chronic pulmonary Diseases especially pulmonary tuberculosis and bronchogenic carcinoma becoming more important because of repeated emphasis on the dreadfulness by both chest physicians and health officials and also increasing understanding of the diseases by the laymen.

However, the symptoms and signs of chronic pulmonary diseases are often quite similar and create confusion and delay the valuable treatment. Therefore, correct early diagnosis of these chronic Pulmonary diseases is utmost important.

One must consider the following diseases under the term of chronic pulmonary diseases:

a. Infection and Sequela
   Tuberculosis
   Fungus diseases
   Atypical pneumonia
   Chronic suppurative lung diseases
   Non-specific pneumonitis
   Atelectasis
   Fibrosis & Emphysema

b. Diseases due to occupational dusts
   Pneumoconiosis

c. Tumors and Cysts
   Carcinoma
   Lymphomas
   Metastatic neoplastic diseases
   Benign intrathoracic tumors

d. Diseases of allergy
   Bronchial asthma
   Eosinophilic pneumonopathy
   (Loeffler’s syndrome)

e. Congenital Anomalies & Structural changes
   Congenital anomalies
   Bulous emphysema
   Cystic diseases

f. Trauma
   Radiation fibrosis
   Diaphragmatic hernia

g. Foreign bodies
   Aspiration pneumonitis

h. Blood vascular and circulatory disorders
   Leukemia and polycythemia vera
   Passive congestion and other circulatory changes

i. Diseases of unknown etiology
   Collagen diseases
   Sarcoidosis
   Eosinophilic granuloma

However, because of limitation in time, I would like to discuss only the following few diseases which are more frequently seen in our daily chest clinic; Pulmonary tuberculosis, Bronchogenic carcinoma,
Psychosomatic Aspect of Pulmonary Tuberculosis

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The author briefly reviewed the literatures on the pathogenesis and clinical symptoms of tuberculosis. From the psychosomatic medical aspect, in tuberculous infection, it is emphasized that the aggressor is not the only tuberculous bacillus but the patient himself e.g. “self-destructive-Tendency”, which can be expressed psychologically and physiologically.

From the point of personality trait, obsessive-compulsive personality is predominant among the tubercular person.

The author should emphasize that we have to treat not only the tuberculous evison but the total person who has “Self-destructive-Tendency” e.g. hateness and aggressiveness. So psychotherapy is also emphasized.
sputum is from deeper infection.

3. HEMOPTYSIS
Most frequently bronchiectasis, fibroid tuberculosis, chronic lung abscess and carcinoma cases develop hemoptysis. However, hemoptysis may occur in the course of cardiac diseases associated with hypertension, arteriosclerosis or the lesser circulation, mitral stenosis and congestive heart disease associated with pulmonary infarction are most outstanding examples.

4. CHEST PAIN
Fibrotic pulmonary tuberculosis and carcinoma cases particularly lesions-located near the pleura are the most common instances of chest pain.

5. DYSPNEA
Diseases affecting the terminal units of the lungs or the small deversions of the pulmonary artery (miliary tuberculosis, histoplasmosis and silicosis, pulmonary arteriosclerosis) are characterized by rapid and shallow respiration, on the other hand prolonged and labored respiration is in emphysema and cystic, and bronchial asthma.

However, appearance of orthopnea is presumptive evidence of cardiocirculatory failure.

III. Physical Examination
The diagnostic value of the physical examination of the chest and lungs is frequently disappointing in most chronic pulmonary diseases and often or no use for differential diagnostic purpose except for certain extremely obvious cases such as barrel-shaped chest with hyperresonant in emphysema and hyporesonant chest with venous distention and massive looking neck in Hodgkin’s case.

Differential diagnostic value of temperature, pulse and respiratory rates is not great value. Blood cell sedimentation rate is elevated in inflammatory reactions and with tissue destruction, and therefore, is nonspecific.

B) Specific Diagnostic Procedures

IV. Laboratory Procedures

1. SKIN TEST
The tuberculin, coccidioidin and histoplasmin are most commonly employed for skin test. The skin test must be performed with 1/10,000 dilution at first and if negative, a higher concentration of antigen must be used before a definite result of skin allergy is decided. However, when a higher concentration of antigen is employed, very often there will be a cross reaction between these diseases. In general, a positive reaction to a skin test indicate that the patient has or has had an active infection. A negative reaction rules out the disease being studied unless the patient is in positive anergy. It should also be mentioned that in a pre allergic stage or recent infection, the reaction will be negative. A negative or depressed skin reaction may also be seen if the patient is with measles or extremely dehydrated. A positive tuberculin test in a child of under two years old indicates active disease. A degree of positive reaction does not indicate seriousness of the disease. Therefore, if one con-
ducts proper skin test, it will furnish with contributory differential diagnostic point, especially negative reaction rules out the disease in question.

2. SPUTUM

When a chronic pulmonary disease case raises sufficient sputum, it must be examined for the presence of tubercle bacilli first, on smear and culture or animal inoculation if necessary. If the patient does not raise sputum, fasting gastric content shall be employed. However, to speed up the procedure, slide culture method can be used to demonstrate tubercle bacilli within two to six days. A fresh specimen should also be examined for the presence of ova and parasite as well as fungi, if necessary under a simple cotton blue stain. Culture on Sabouraud' glucose agar and blood agar medium shall be conducted in usual manner at both room and incubator temperature to demonstrate pathogenic fungi. However certain precautions must be undertaken to collect all the specimen for fungi to illuminaet contaminants. Gastric contents can not be routinely used for the purpose of fungus culture as coccidioides immitus and Histoplasma Capsulatum will easily be killed. If a patient is suspected malignant tumor, sputum must be collected in 70% alcohol to fix and Papanicolaou' technique shall be employed to demonstrate malignant cells.

3. Serologic Procedures

Demonstration of a rising cold agglutinin titre is important of diagnosis of atypical pneumonia in a week of the disease. Complement fixation, precipitation, hemagglutination, agglutination tests are used for certain fungus diseases such as histoplasmosis, coccidioidomycosis, brastomycosis and moniliasis. Recently hemagglutination test for tuberculosis had been introduced but has very little diagnostic value.

V. Bronchoscopic Examination

Bronroscope is primarily used to remove foreign bodies from larynx, trachea and bronchi but for the purpose of a diagnosis, it is to observe pathologic changes appeared in the bronchus and to obtain bronchial secretion, and its washings or to do a biopsy from a suspicious lesion to study for malignant cells or tubercle bacilli. It is particularly indispensable for the diagnosis of bronchogenic carcinoma unless the lesion is too near the periphery.

VI. Bronchogram

It is the most useful means of diagnosis for bronchiectasis and further to outline the type of disease. segments and lobes involved. It is occasionally helpful to differentiate normal lung tissue from lung abscess, cystic disease or emphysema.

VII. Trial Chemotherapy

When a patient has a suspicious pulmonary lesion which is indistinguishable by the previously described methods, trial chemotherapy will be of a great value in differential diagnosis especially tuberculosis and atypical pneumonia. The results following trial chemotherapy is easily demonstrable thru clinical course as well
as on a serial radiogram to a certain chemotherapeutic agent within a matter of a few weeks to one or two months.

VIII. Biopsy

Biopsy of supraclavicular or axillary lymphnodes for bronchogenic carcinoma and Hodgkin's disease and involved periperal lymphnodes for sarcoidosis has a definite differential diagnostic value.

IX. Exploratory Thoracotomy

When a persistant pulmonary lesion remains unknown following all the previously described diagnostic procedures have been tried, exploratory thoracotomy must be considered. Usually so-called pulmonary round lesion is one of the following; tuberculoma, carcinoma, fluid filled cyst and occasionally, coccidioidomycosis, non-calcified tuberculous lymphnode, lymphoma, sarcoitosis, histoplasmosis, neurofibroma, and hematoma.

X. Radiographic Examination

Location of the shadow, shape and size of the lesion, extend of the density, general appearance of the lesion, cavity with or without fluid level and emphysema must be carefully studied however, these will not be discussed here in detail and I will refer these important differential diagnostic points to the distinguished next speaker with one emphasis that a single P-A chest film will not be much helpful but obtain old films for the purpose of follow-up study and evaluation.