DIAGNOSTIC PROCEDURES IN TUBERCULOSIS

NATIONAL TUBERCULOSIS ASSOCIATION PRESENTS

"DIAGNOSTIC PROCEDURES IN TUBERCULOSIS"

DIRECTION
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In the frontline of the fight against tuberculosis is the general practitioner. He sees the patient first, and upon his skill and judgment depends the patient's future. There are certain diagnostic procedures every general practitioner is capable of carrying out. One of these is the examination of the sputum. To refresh our memories, Dr. Ralph S. Muckenfuss, director of the Bureau of Laboratories of the New York City Department of Health, will demonstrate a simple technique of sputum examination. Dr. Muckenfuss."

"The reagents needed to demonstrate tubercle bacilli in sputum are carbol fuchsin, acid alcohol and alcohol in methylene blue. We need also an alcohol lamp, a platinum loop and a glass slide.

Flame the loop until it is red. A selection of proper particles of sputum is important. Small purulent or caseous particles should be fished out and smeared thinly on the slide. After the smear has dried, it is fixed in the flame. The smear must not be burnt. The slide is flooded with carbol fuchsin, and heated to steaming but not to boiling. This heating must be continued for three or four minutes.
The stain is poured off and the slide rinsed with water. Stained smear is then decolorized with acid alcohol until no more color appears in the washings.

Finally, the specimen is counter-stained with methylene blue.

A drop of oil.

The short red rods are tubercle bacilli. Finding tubercle bacilli in sputum is direct evidence of pulmonary tuberculosis. Failure, however, does not mean absence of disease. If repeated efforts fail, the sputum should be submitted to a laboratory where special methods may be employed."

“One of our valuable diagnostic aids is the tuberculin test. A positive reaction means infection by tubercle bacilli. I have the pleasure of presenting Dr. Esmond R. Long., director of the Henry Phipps Institute of Philadelphia, who’ll demonstrate the test for us.”

“We use purified protein derivative instead of old tuberculin, because it’s more uniform and a standard. It’s put up in two strengths accompanied by vials of sterile buffered saline solution. When a tablet of the first strength is dissolved in one cubic centimeter of the saline solution, one tenth of a cubic centimeter contains the recommended dose. If no reaction follows the use of the first strength, the test is repeated with the second strength.

Use a one cubic centimeter tuberculin syringe that has been sterilized. Inspect the needle for sharpness. Flame it to make sure that it is sterile.
Draw the sterile buffered saline solution into the syringe. And transfer it with aseptic precautions to the bottle containing the tablet. Dissolve the tablet. Withdraw one tenth of a cubic centimeter into the syringe.
Cleanse the forearm with 95% alcohol.
Insert the needle intradermally. This is important, for if the solution is injected under the skin, no skin reaction may result.
Here’s a diagram to make this point clear. This is the wrong way.
If done like this, the right way, a small white weal will rise over the needle point. Hold the needle almost parallel to the skin as it is inserted. Inject one tenth of a cubic centimeter of the tuberculin solution.
Did it hurt?

- No, doctor, no more than a mosquito bite.”

“The test is read in 48 hours. Hold the arm in a good light and flexed a little at the elbow. Taut muscles may obliterate the reaction. Look across the arm rather than down on it. A positive reaction is one that shows edema and redness of varying degree. If there’s no edema, the reaction should be considered negative. When in doubt, pass the finger over the tested area. Sometimes, the induration can be felt when it cannot be seen.”

“No examination of a case in which tuberculosis is even remotely suspected is complete without a good chest X-ray. Only a specialist should be trusted to interpret the X-ray film, but it is exceedingly valuable to do this in consultation with the general practitioner. Dr. Edgar Mayer, Assistant Professor of Medicine at Cornell University Medical School, will explain to us certain fundamental facts in the X-ray diagnosis.”

“In reading the X-ray film, we must know its appearance in health, and the wide variations that can come within normal limits in a properly exposed film.

The appearance of the healthy chest varies within wide limits. The hilum is an irregular conglomerate shadow lying at the root of the lung. It is made up chiefly of shadows of blood vessels, lymphatics, bronchi and tracheobronchial lymph nodes. In the adult, calcification of these lymph nodes at the root of the lung are consistent with health.

In diagnosis, the kind of shadow means less than the location. Lesions situated at one apex only are, in about 90% of cases, tuberculous, and almost invariably so when they involve both apices. On the other hand, a lesion at one base only is rarely tuberculous, and, at both bases, almost never tuberculous. The exact interpretation of the kind of shadow, namely the

pneumonic lesion, as against the proliferative, or the fibrotic, is possible on the X-ray film only in the most typical shadows.

This, a pneumonic exudative form, is a confluent shadow. This, a proliferative form, is discreet. And this, a fibrous form, is rather linear. Such terms, as active or quiescent, should not be applied to lesions on a single film until corroborated by history, clinical and laboratory findings. Thus, this patient with a fibrotic scar had a recent hemorrhage, and this one, with a confluent shadow, had no symptoms of active disease for five years.

To illustrate first infection forms of tuberculosis, we have here a primary bronchopneumonia in a child of six months that was nursed by a maid, who flatly denied any subjective symptoms, but who showed extensive pulmonary disease by the X-ray.

This film, of another primary complex, shows the pulmonary component, the Ghon focus, and the lymph glandular hilar shadow in a child of three years. The tuberculin test, taken in a routine survey, was found positive, and checkup by the family physician revealed, as a household contact, a grandparent.
With this evidence of advanced tuberculosis, he'd been treated for so-called asthma and chronic bronchitis for many years. And subsequently, sputum examination in this contact showed tubercle bacilli.

In reinfection tuberculosis, this latent apical shadow gave no clinical symptoms, nor any definite physical signs.

This early infraclavicular infiltrate occurred in a medical student, with only slight grippal symptoms, and gave no obvious abnormal physical findings.

This patient, markedly emaciated, had a profuse hemorrhage from the lungs. We expected to find great lung damage, but the X-ray revealed this minimal lesion in the lung.

This athlete boasted of his great physical strength and belittled his coughing sputum, ascribing it to cigarettes. The X-ray revealed this multiple-cavity formation.

Without a good X-ray picture, no examination for tuberculosis is complete, and suspected tuberculosis cannot be detected nor ruled out without it."

"These three procedures are important aids in making the diagnosis of tuberculosis. Yet it is not enough merely to establish the diagnosis. It must be done promptly, for a good prognosis is largely dependent upon early diagnosis. Let me illustrate with the results of a study of a large group of patients known to have had tuberculosis.

Here are ten persons in whom a diagnosis of tuberculosis was made. An average of six months elapsed from the time of appearance of the first symptom to the date of diagnosis. When classified according to the stage of the disease, they fell into three groups: 40% were in the minimal stage, 50% in the moderately advanced and 10% in the far advanced stage. Here's another group of ten, though with a delay of six to twelve months in diagnosis. This group was classified so.
A third group suffered a delay of from one to four years, from the time of the appearance of the first symptom to the time of diagnosis, and only 15% were in the minimal stage. The

group in whom a definite diagnosis was made four or more years after the appearance of the first symptom fared badly: 45% were in the far advanced stage."

Transcript: Nicolas Guechi & Séverine George