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Chronic Pneumonia or Tumor of the Lung

AN INTERESTING OBSERVATION OF INFILTRATION
OF THE RIGHT UPPER LOBE

WILLY MEYER, M.D.
NEW YORK



Reprinted from the Archives of Surgery
January, 1925, Vol. 10, pp. 431-444

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CHRONIC PNEUMONIA OR TUMOR OF THE LUNG

AN INTERESTING OBSERVATION OF INFILTRATION OF THE
RIGHT UPPER LOBE

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It is recognized today that in refining the diagnosis in nonspecific affections of the lung with productive sputum, roentgenography and bronchoscopy in addition to the careful and complete clinical and laboratory examination of the patient, are of greatest assistance to physician and surgeon.

After the roentgen-ray examinations have shown haziness, fuzziness, infiltration, cavity formation with and without a fluid level on the stereo-roentgenograms—in the erect and horizontal posture as well as in the lateral view—the trained bronchoscopist will give us further details. Having thoroughly evacuated the mucopurulent secretion from the bronchial tree by means of suction, he is in a position to watch the appearance of the discharge at the very outlet of its source, at the respective bronchial opening, and also to detect, at the latter spot, granulations, ulcerations and stenosis of orifice or lumen; this visual observation then can be corroborated by intrabronchial instrumental manipulations.

Most important clinical data will be collected in this way, which, in conjunction with the results of the original examination, affords a degree of precision unheard of one or two decades ago.

Of course, physician and surgeon must have learned to segregate from the start. The carefully taken history and the general—call it rough—laboratory findings, must have led them on to the right track in their diagnostic endeavors.

In the interest of an eventually required surgical intervention, the surgeon's hope may be repeated at this juncture,¹ that competent roentgenologists will lend their efforts to a still more detailed localization of the diseased focus as to depth, direction and distance from a fixed spot or spots of the skeleton, within the rather vast area of the two sides of the chest cavity. True, laudable beginnings have been made; but reliable information at the hands of the roentgen-ray specialist, as compared to his able guidance in cases, for instance, of a foreign body in other regions than the chest, is still outstanding.

1. Meyer, Willy: Observations on Lung Suppuration and Its Treatment, *Arch. Surg.* 6:361-425 (Jan.) 1923.

Of course, it may be said that such endeavors are superfluous nowadays, in that the surgeon can with impunity open the pleural cavity, inspect and palpate the lung in order to determine the presence of infiltration of the lung tissue and of localized adhesions between pulmonary and costal pleura, and let his decision as to the required operative procedure rest on such data. It may further rightly be said that the surgeon can resect ribs in sufficient number and length in order to be guided in his search for the diseased area of the lung by the pink—yellow—and free mobility of the healthy lung as it shines through the costal pleura under bright illumination, in contrast to the bluish-black appearance of the depth of the operative field and immobility of the lung with the acts of respiration, when the surface of the true area of the inflamed lung tissue has been exposed. However, nobody can and will deny that work of this character and extent may complicate the surgical procedure and in many cases may reduce the chances for the patient's recovery. Whereas, if we knew greater details *with precision* through the work of the roentgenologist, the chances for recovery in the given case might accordingly be enhanced, particularly in weak and reduced patients. I am sure that every general surgeon who has added the inside of the chest to his daily work as well as the specializing thoracic surgeon, will have wished for this "intrathoracic advance" in roentgenography, an advance so direly needed. Should it come forth, it will mean another great step forward in the conservative treatment of suppurative diseases of the lung.

The foregoing refers to affections of the lung that show productive sputum. But what is the situation, if the sputum is a negligible factor in the clinical picture, if it amounts to less than 1 ounce (30 c.c.) in twenty-four hours, or is entirely missing, if repeated analysis of the sputum does not yield characteristic signs, if, in a reduced and weak patient, the differential diagnosis at last rests between tumor and chronic inflammation of a portion of the lung? A quick way of severing the Gordian knot, of course, would be to do an exploratory thoracotomy. But supposing there is unalterable opposition on the part of the patient, as well as his family, to all operative intervention, and supposing bronchoscopy does not appear to be indicated and, at the same time, represents an unnecessary strain for a debilitated patient above 50 or 60?

Here, continued and careful clinical examination and observation—best at the hospital—giving particular regard to the information furnished by regular thermometry; patience and perseverance in the laid down line of treatment, and the thorough analysis and study of the result of the therapeutic measures, as they appear from week to week, will be the torchlight of hope in the given case. Proper expert interpretation of the roentgenograms, taken at regular intervals, will assist in determining whether the course of the medical man is right or wrong.

A case of the latter type, recently observed, which elicited a great deal of discussion, pro and con, with respect to an eventual surgical intervention has furnished the incentive for the presentation of this paper.

REPORT OF CASE

S. R., a man, aged 53, first seen by me in consultation at his home, Oct. 27, 1923, had always been well up to September, when he felt weak and complained of a "whistle in his chest, when he breathed." Two weeks prior to my visit he had developed all the signs of a bronchial pneumonia of the right upper lobe.

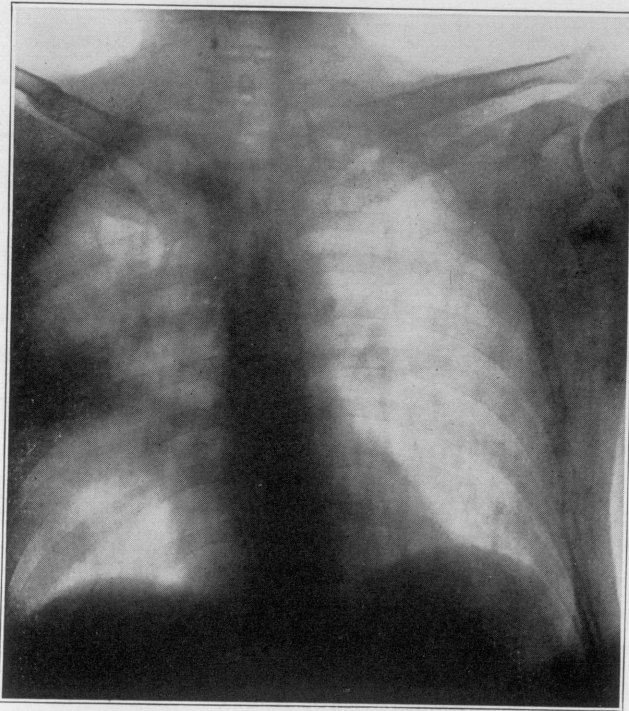


Fig. 1.—Roentgenogram, taken at end of October, suggesting the diagnosis of an interlobar empyema on the right side, particularly in the light of the clinical history and phenomena.

With the usual treatment at the hands of his family physician, a drop of the fever to almost normal was noticed on the seventh or eighth day after the onset of the severer pathologic symptoms. Shortly thereafter, the temperature rose again.

A nurse was engaged, and a regular chart started. The fever was hectic in character, touching the normal level in the morning and rarely rising above 103 F. in the afternoon. A bedside roentgenogram showed a non-infiltrated right upper lobe and a number of opaque areas, running in a rather horizontal, outwardly slightly oblique upward line, corresponding to the space between the right upper and middle lobe (Fig. 1). The roentgenologist,

in consultation with the attending physician, interpreted the picture as right interlobar empyema, and suggested, should aspiration be deemed indicated, introducing the needle in the fifth interspace posterior to the axillary line. This was done on the morning of the day I saw the patient, but no pus was found. The result of percussion and auscultation at my hands was rather negative; there was slight dulness anteriorly and posteriorly, corresponding to the right upper lobe, but hardly a râle; there was no sputum that could be seen and investigated. The sputum, very scant, had shown a few streaks of blood on previous days and some mucopus without tubercle bacilli. I concurred with the probable correctness of the diagnosis of a beginning interlobar empyema, particularly on the basis of the roentgenogram and the curve of

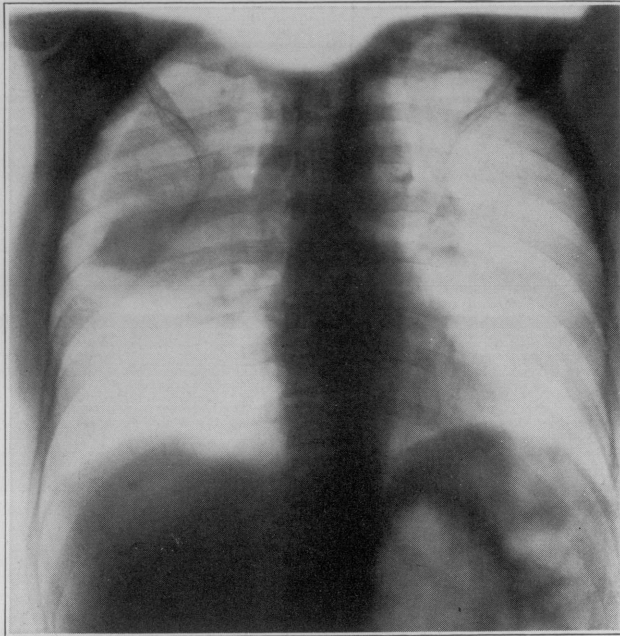


Fig. 2.—November 5, an unintended slight artificial pneumothorax following exploratory puncture, done with negative result.

the fever, and advised a stereoscopic roentgen-ray examination at the roentgenographer's office with continued careful clinical observation at home. The stereoroentgenogram was taken five days later, November 5. It showed a pneumothorax in the upper portion of the chest, producing partial collapse of the superior lobe, which, on the film, appeared opaque and infiltrated (Fig. 2).

A change in the patient's general condition soon caused worry among the members of the family, and he was admitted to the private division of the Lenox Hill Hospital under my care, November 6.

The pulse was slow, less than 90 a minute; the temperature was of the same hectic type as before, but about 1 degree lower than previously recorded, the reduction being probably due to the unintended artificial collapse of the affected portion of the lung; respiration was not above 25; cough was rare.

The sputum was very scant, containing some mucopus, and was now and then streaked with blood; it was negative for tubercle bacilli and tumor cells. The Wassermann reaction was negative. There was no tumor in the rectum. The urine analysis revealed no albumin and no sugar. The blood count showed a low percentage of polymorphonuclear leukocytes; the white blood cells totaled 15,000. Inspection, palpation, percussion and auscultation pointed to an inflammatory affection of the right upper lobe. The alternatives in differential diagnosis were: interlobar empyema; nontuberculous, subacute pneumonia, and tumor formation. Examination of the blood sugar equilibrium pointed to the absence of malignancy.²

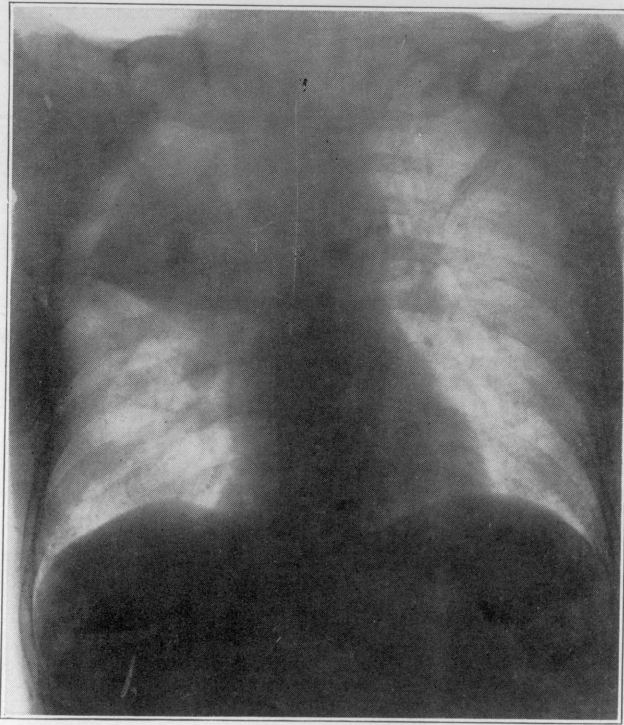


Fig. 3.—Pneumothorax and infiltration of right superior lobe increased; exposure in supine posture of patient, November 13.

The treatment was expectant; rest in bed; care that there should be the proper amount of intake and sufficient output; a Priessnitz dressing over the upper portion of the right side of the chest, day and night; a follow-up of the intrathoracic condition clinically and roentgenographically, observing the gradual disappearance of the accidental pneumothorax. The necessity of patience and perseverance was persistently impressed on the patient's mind.

Dr. William H. Stewart reported that the roentgenograms taken, October 30, showed distinctly a pneumonic process in the upper right chest. Observations

2. Observations at Lenox Hill Hospital showed about 80 per cent. of reliable results from this type of examination, at least in intra-abdominal cases.



Fig. 4.—The same condition as in Figure 3, with the patient in lateral posture, November 13.

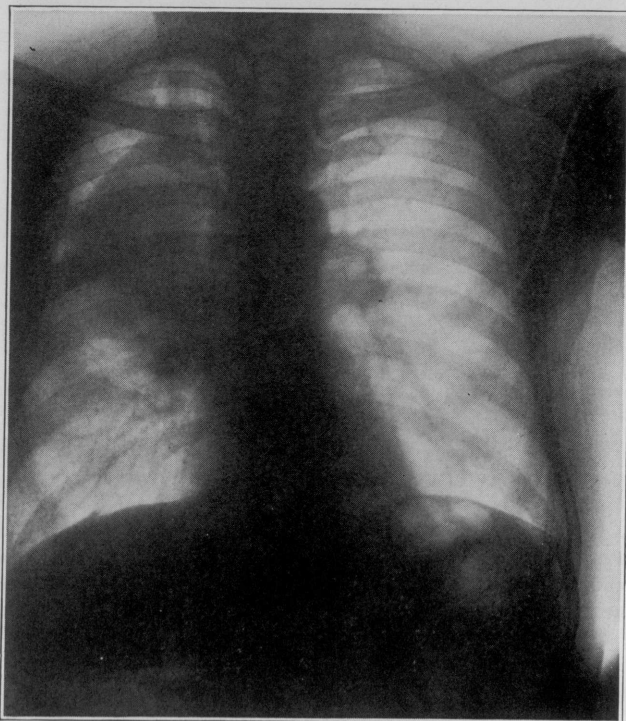


Fig. 5.—November 16, the same condition as in Figures 3 and 4 with the patient in erect posture, anteroposterior view; pneumothorax increased; adhesions at the apex particularly well marked.

made, November 5, before admission as well as those made at the Lenox Hill Hospital, revealed what was apparently a solid right upper lobe; there was some air in the upper portion of the right pleural cavity with some recedence of the lung from the chest wall (Figs. 3 and 4).

November 16, according to all the roentgenograms taken, there was collapse of the upper right lobe, due to pneumothorax; bands, pleuritic adhesions were preventing complete collapse at the apex (Fig. 5); the shadow of the collapsed lung was very smooth and dense, which would seem to indicate either merely a collapsed, air-free lung or some remaining inflammatory process. There was nothing in the roentgenogram that would suggest an interlobar empyema. The lower lobes of the right lung had not collapsed, which was

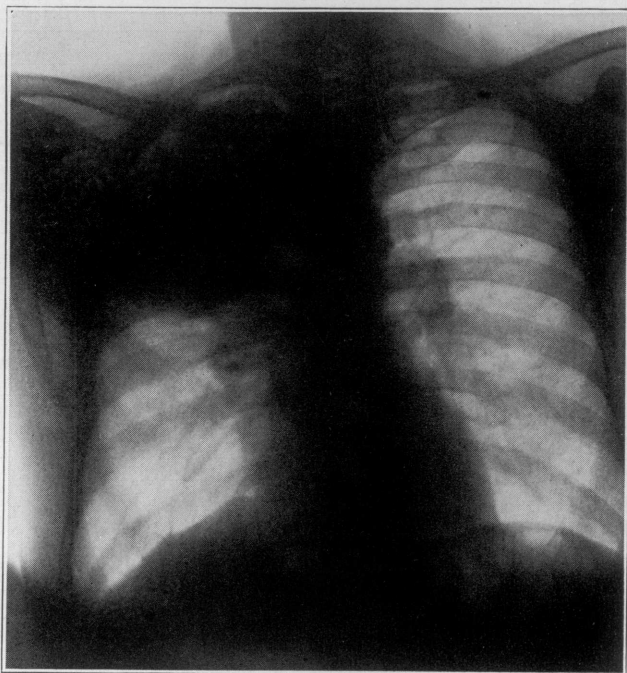


Fig. 6.—Pneumothorax decreased; roentgenographic diagnosis: tumor or sacculated fluid rather than chronic pneumonia.

evidently due to a blocking of the lower portion of the right pleural cavity with adhesions. The shadow seen in the film taken on November 5, posteriorly, suggested a possible interlobar empyema; the one taken anteriorly, however, and a subsequent series made seemed to exclude this lesion. The shadow, as seen in the anterior film of October 30, seemed to indicate that the process limited itself to the lower portion in the upper right lobe.

November 20, fluoroscopic examination, as well as the stereoroentgenograms in both anterior and posterior positions, revealed that the upper right pneumothorax had considerably increased. The entire right upper lobe was collapsed and, fluoroscopically, it acted much like a carnified lung; a pus sac could not be recognized.

December 4, the collapsed upper lobe of the right lung was considerably expanded, and the pneumothorax had greatly diminished. The lung substance was much more dense than noted on the previous examination; the outline seemed to be rather irregular (Fig. 6). The roentgenographic findings favored a sacculated fluid or lung tumor rather than chronic pneumonia. The indications seemed to be for further needling in an attempt to obtain fluid. A side view taken failed to show adhesions of the pleural leaves in front; aspiration was, therefore, not carried out.

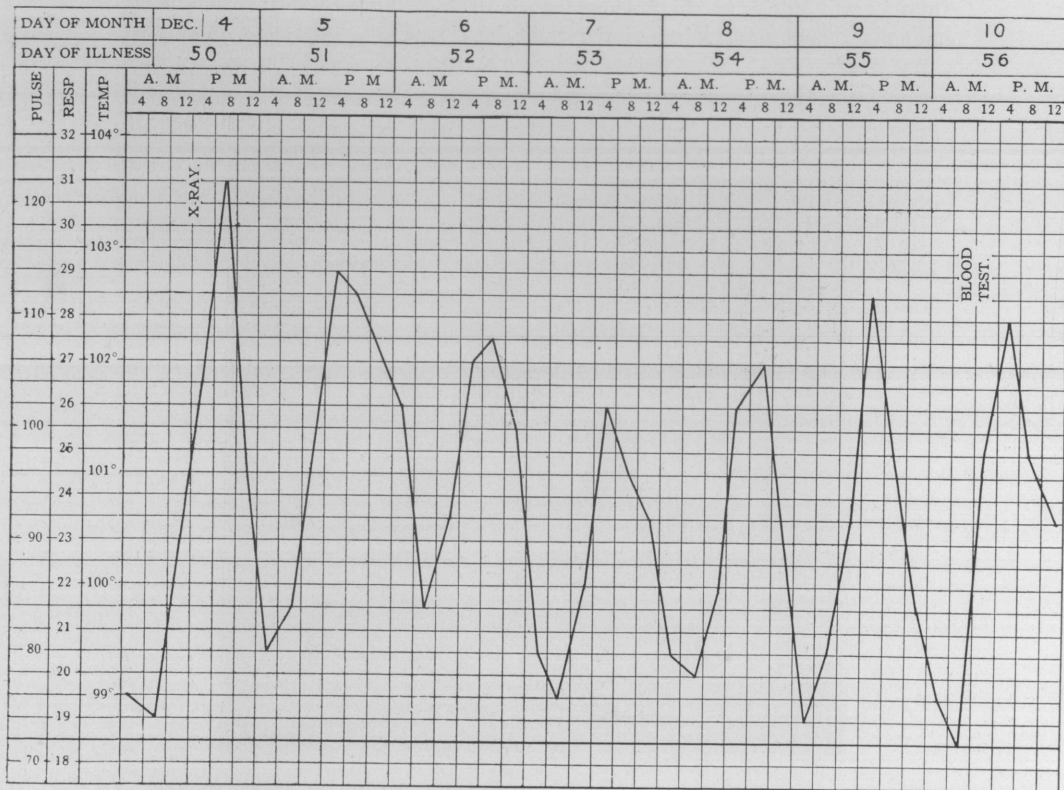


Fig. 7.—Chart of temperature of week, from December 4 to 10, showing the continued hectic type of fever. All temperatures are rectal. White blood cells totaled 16,200; polymorphonuclears were 86 per cent.; mononuclears, 14 per cent.

December 12, the right upper pneumothorax had almost completely disappeared; there was what was apparently a solid upper lobe, the lower border of which was sharply outlined.

December 7, there were signs of pleurisy over the upper part of the right lower lobe, posteriorly. Physical examination, December 9, revealed the slight lagging behind of the right side of the chest on deep inspiration. On palpation, over the right chest, anteriorly, just below the clavicle from the midline outward to about the midclavicular line, vocal fremitus was somewhat diminished.

Over the right base, it was slightly increased posteriorly with a very slight friction rub perceptible. On percussion, in the supraclavicular fossa and in front of the chest over the right upper lobe, just below the clavicle from the midline outward to the midclavicular line, there was a flat percussion note with an admixture of slight tympany; externally to this, in front, there also was flatness, while posteriorly, over the apex, there was resonance, as elsewhere over the lung.

On auscultation, over a very much circumscribed area in the supraclavicular fossa and below the clavicle from the midline outward and down to the level of the third rib in the midclavicular line, there was bronchial breathing, voice sound and whispered sound, but no râles on coughing. At the base of the right lung, posteriorly, from the angle of the scapula downward and as far forward as the posterior axillary line, a loud friction rub could be heard on inspiration and expiration, but no bronchial breathing. Everywhere else over the lung, there was normal vesicular breathing; voice sounds were easily audible. There were no physical signs of pneumothorax. The temperature was of the same hectic character as previously, dropping to normal with heavy perspiration early in the morning, and rising regularly to from 102 to 103 F. and more, in the afternoon (Fig. 7), often with a distinctly chilly sensation; there was hardly any cough or expectoration.

December 11, consultation was held with Dr. O. M. Schwerdtfeger of the medical division who inclined to the diagnosis of an inflammatory process of the right upper lobe rather than a neoplastic one and advised alternating daily treatment with Alpine sunlight and diathermia in conjunction with the same local and general tonic and stimulating regimen as carried out so far.

This advice was promptly acted on, and the treatment was carried out regularly and faithfully in the physiotherapeutic division of the Private Building of the Lenox Hill Hospital. After two treatments, queer to report, one of diathermia and one of Alpine sun, the afternoon temperature dropped 2 degrees (Fig. 8); however, there were occasional rises above 101 or 102 F.; the slight cough with expectoration slowly increased; the latter contained bright blood for the first time subsequent to the eighth physiotherapeutic application, with the highest temperature of the day at 100.4.

In the course of the last three weeks, the white blood corpuscles had been counted usually around 16,000; polymorphonuclears increased from 72 to 86 per cent. (December 10).

December 11, white blood cells numbered 22,000; polymorphonuclears, 86 per cent.; December 15, white blood cells, 20,400; polymorphonuclears, 78 per cent.; December 22, white blood cells, 16,900; polymorphonuclears, 76 per cent.

At a second examination of Dr. Schwerdtfeger's December 23, he noted that, in the right lung, anteriorly down to the third rib was dulness; near the sternum at the second interspace was an area of tympany. Posteriorly, there was dulness over the entire lung, quite marked at the apex and gradually lessening; at the base, the percussion note was about normal. In the infraclavicular region, the respiratory murmur was bronchovesicular; at the angle of the scapula was a large area of pleural friction rub; only a few râles were heard in the infraclavicular region and they were obtainable only on deep inspiration after coughing; the heart was not displaced; the left lung was normal; there were no evidences of pressure or enlarged glands. The physical signs were about the same as two weeks before, except that there was some bronchial character to the breathing in the infraclavicular region; the general condition seemed to be greatly improved.

The anatomic diagnosis was a chronic inflammatory process of the upper half of the right lobe with thickening of the pleura and roughening of the pleura over the entire lung posteriorly. The clinical diagnosis was chronic pneumonia or neoplasm of the right lung. The physical signs could fit either condition. There were no characteristic signs of neoplasm, such as pressure symptoms, glands, or cardiac displacement, nor were there any areas showing complete solidification of lung tissue. The general evidences of receding inflammation (fewer leukocytes), the pleurisy and the slight improvement in physical signs rather than a progression made the diagnosis of chronic or unresolved pneumonia the more probable. Continuation of the physical treatment was urged.

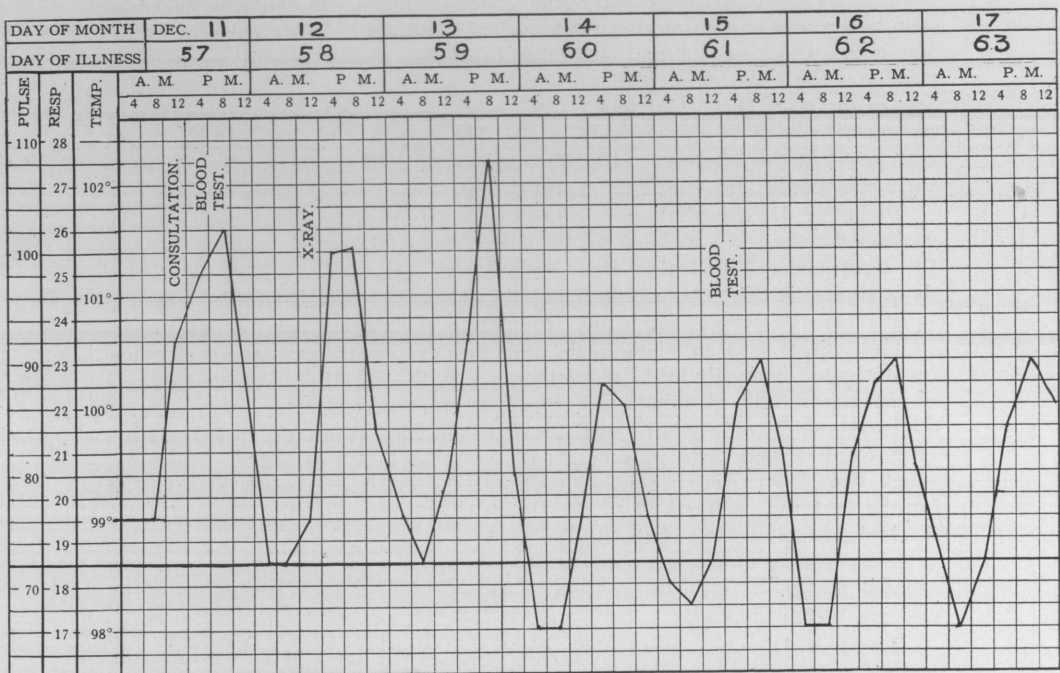


Fig. 8.—Chart of the week following that of Figure 7, December 11 to 17, showing the remarkably prompt and lasting drop in the temperature (December 14) after the start of physiotherapy. December 11, white blood cells totaled 22,000; mononuclears were 14 per cent.; polymorphonuclears, 86 per cent. December 12 to 15, white blood cells totaled 20,400; polymorphonuclears were 78 per cent.; mononuclears, 22 per cent., and systolic blood pressure 110, diastolic 90.

Beginning, December 27, the afternoon temperature never reached 101 F. and dropped under 100, Jan. 3, 1924, for the first time, continuing normal after that, with the exception of January 12-13, when the highest recorded was 101.4 and 100 F., respectively (Fig. 9).

The roentgen-ray examination report stated that the lower border of the consolidated upper right lobe seemed to show some evidence of aeration. The

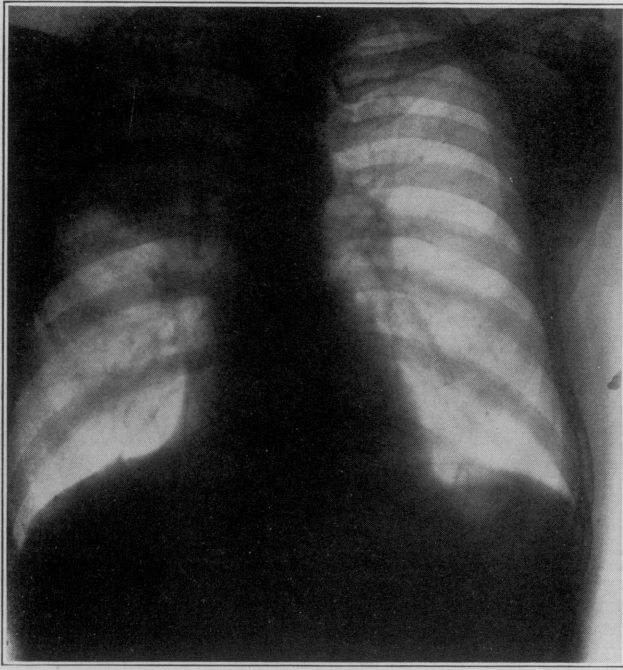


Fig. 10.—January 4, the entire right upper lobe more transparent in the stereoroentgenograms, suggesting the gradual disappearance of the chronic pneumonic infiltration under continued alternating use of diathermy and Alpine sun.



Fig. 11.—Appearance of the right upper lobe, March 5, after patient had gained almost 20 pounds (9 kg.); there can be no doubt that the malignant tumor got the upper hand.

where he stayed for two months, gaining over 15 pounds (6.8 kg.). The temperature rose to from 101 to 102 F. on rare occasions, and the scanty sputum showed blood now and then.

March 6, the roentgen-ray and fluoroscopic reexamination report stated that the process in the right upper lobe was much the same as when the patient was last examined at the hospital. The case was felt to be one of malignancy and it was hoped to prove or disprove this diagnosis by further observation (Fig. 11).

April 4, after clinical examination, Dr. Schwerdtfeger reported that the patient complained of pains over the lower ribs anteriorly and posteriorly, and of general weakness. There was the same dullness from the clavicle down to the third rib present as before; over it slightly exaggerated vesicular breathing. There were no glands felt, and no signs of pressure; hemoglobin was 90 per cent.; the weight was 132 pounds (59.9 kg.).

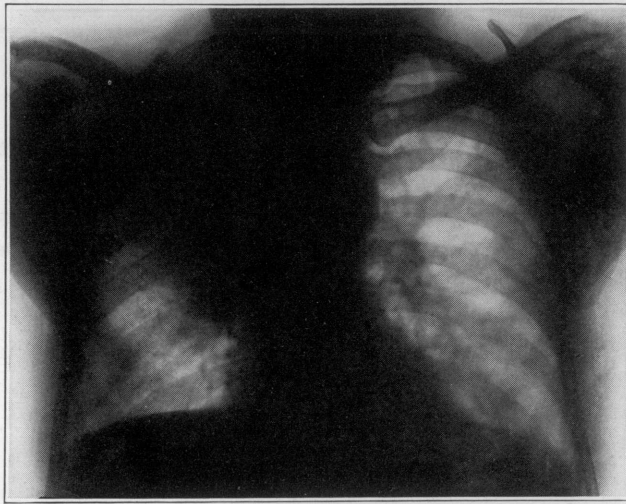


Fig. 12.—Marked increase in the growth of the pulmonary neoplasm, May 10.

April 23, there was pain in the chest and upper abdomen; the sputum often was bloody; there was distinct, harsh tubular breathing, anteriorly, in the second intercostal space, next to the sternum and in the interscapular space, likely due to the pressure on the trachea. The hemoglobin was 73 per cent.; the weight, 126 pounds (57.2 kg.).

May 8, the patient was again seen by me. He had lost 10 pounds (4.5 kg.), and complained of great pain in the region of the liver. The latter was not enlarged, and the pain was probably due to intercostal neuritis, dependent on the involvement of the intercostal nerves by the advancing tumor formation, which was clearly visible in the roentgenogram taken, May 10 (Fig. 12). The sputum was mucopurulent, and increased in quantity (probably beginning bronchiectasis complicating the neoplastic disease).

Today, in the light of further developments, a combination of a chronic inflammatory process of the lung *with* tumor formation is the most plausible diagnosis in this case. Physiotherapy with the Alpine sun and diathermy reduced

or removed the inflammatory infiltration; but, of course, the tumor continued to grow, although malignant cells never were found in the sputum. Beginning early in May, the effect of deep roentgen-ray treatment was tried.

During the first days of June, the patient developed high fever with difficulty in breathing. He died, June 12. No necropsy was done.

I regret that I did not insist on bronchoscopy shortly after the patient's admission to the hospital; it was the only modern examination which was not employed, and might have earlier cleared up the additional diagnosis of "tumor." Perhaps a small growth could have been seen within the bronchus; but in view of the very scant sputum and the greatly reduced general condition of the patient, it did not seem to me to be indicated at that time.

Later on, the slight hemoptysis on the day of the patient's discharge from the hospital was very suspicious, although the subsequent remarkable gain in weight was again reassuring.

SUMMARY

1. There is great difficulty in differentiating between chronic inflammation and tumor formation in the lung in certain cases.

2. There is the possibility of a combination of the two diseases in the early stages of a malignant tumor.

3. A typical, hectic type of fever in chronic affections of the lung in the absence of purulent sputum, so often seen in pulmonary tuberculosis, may occur also in chronic nontuberculous inflammation of the lung, as well as in tumor formation.

4. The therapeutic value of physiotherapy—Alpine sun and diathermy—in chronic inflammatory affections of the lung is great.

5. The possibility that the neoplastic infiltration of the right upper lobe also was benefited by this treatment, at least temporarily, in this case, cannot be denied.

6. It is advisable in subacute and chronic affections of the lung, in which a precise differential diagnosis is difficult, to insist on employing *all* the modern means at our disposal, i. e., bronchoscopy also, if it can be assumed that the patient's condition will likely not be aggravated by this examination.



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