

THE

# BOSTON MEDICAL AND SURGICAL JOURNAL.

NEW SERIES.]

THURSDAY, JULY 1, 1869.

[Vol. III.—No. 22.]

## Original Communications.

### RECOVERY FROM PNEUMOTHORAX, OCCURRING IN A CASE OF INCIPIENT PHTHISIS, WITHOUT PLEURITIC EFFUSION.

Read before the Boston Society for Medical Observation  
by F. I. Knight, M.D.

Miss L. R., a lady's maid, 23 years of age, has always been delicate. Her father is said to have died after three days' sickness, "with a stitch in his side," at the age of 63. Her mother is well at the age of 60. She never had any lung trouble. They had three children; one died in infancy, one daughter is well.

Miss R. never had any long sickness. In January, 1868, she caught cold at a party; had a cough from that time until the next summer, and failed in strength. She thinks she had no cough in the fall, but sometimes had a little tightness at the top of the right chest. In September, 1868, she applied to a physician, who told her there was no disease of the lung, but gave her medicine, which caused her to spit up much thick, offensive matter, and relieved her. She never had hæmoptysis. She says she felt quite well in the beginning of the last winter, but that she got easily fatigued. She insists that she had no regular cough, but sometimes felt a kind of wheezing at the top of the right chest.

On the evening of February 8th, while walking in the street, she felt a stitch across her shoulders, and then a choking sensation and shortness of breath. She, with the aid of a companion, was able to walk home. I saw her for the first time on the afternoon of Feb. 9th. She was lying on her back, with her head raised; her face was slightly flushed; there was nothing like lividity; her countenance was somewhat anxious. When she was lying quiet the respiration was somewhat accelerated, but there was no urgent dyspnoea. The circulation was only very moderately accelerated, the pulse beating about 90 per minute. She had no cough or expectoration. Her voice was

somewhat weakened. She only complained of tightness about the upper part of the sternum. Physical examination:—

On percussion there was much more resonance throughout the right chest, front and back, than in corresponding parts of the left.

On auscultation there was amphoric respiration, with amphoric whisper, and metallic tinkling synchronous with the respiration, heard over nearly the whole of the right chest.

The exaggerated resonance on percussion extended to the very base of the right chest, and there was no sound produced within the chest by succussion.

The above signs could only indicate pneumothorax. The absence of any dulness at the base, and of succussion sounds, showed that there had been no pleural effusion.

Other symptoms and signs in this case, unnecessary for the diagnosis, but which might have been interesting, were not recorded at the bedside, and hence cannot properly, according to the rules of the Society, be reported here.

Having ascertained the existence of pneumothorax, we will next, if possible, find out its cause. The various causes which may lead to the presence of air in the pleural cavity, are classified by Walsh under four heads:—

*I. No Communication Existing between Pleura and External Air.*—(1) Gangrene of pleura; (2) Chemical decomposition of pleural fluid; (3) Air replacing sero-purulent fluid, suddenly absorbed; (4) Secretion by pleura.

*II. Communication between Pleura and Alimentary Canal.*—(5) Rupture of œsophagus into pleura.

*III. Communication with Atmosphere through Opening in Chest-wall.*—(6) Penetrating wounds of thorax.

*IV. Communication between Pleural Sac and Bronchi.*

a. *Traumatic.*—(7) Tearing of lung-surface by broken ribs. (8) Violent contusion of chest, tearing lung without costal fracture.

b. *Perforation, from Disease opening the Pulmonary Pleura from within outwards, or*

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*centrifugal.* (9) Tubercle; (10) Gangrene; (11) Diffuse pulmonary apoplexy; (12) Hydatids; (13) Cancer; (14) Emphysema; (15) Abscess; (16) Rupture in pertussis; (17) Excavated bronchial glands opening into the pleura and bronchi.

*c. Perforation from Disease opening the Pulmonary Pleura from without inwards, or Centripetal.*—(18) Empyema; (19) Parietal abscess.

We are enabled to exclude the First Class from consideration (that including the cases where no communication exists between pleura and external air), because we have evidence of such communication in the amphoric respiration heard over the right chest.

Class Second, in which there is a communication between pleura and alimentary canal, we exclude, because there are no symptoms of rupture of the œsophagus, or of previous disease, which might lead to its rupture.

Class Third is excluded, because there had been no penetrating wound of the chest.

We have now only the Fourth Class left, and of this, subdivision a. is excluded, because the patient had sustained no injury to the chest; subdivision c. is excluded, because the patient had no sign of empyema, or parietal abscess, which would cause perforation from without inwards. In subdivision b. we find (9) Tubercle, which is the cause of pulmonary perforation in the great majority of cases of this affection. Have we any evidence that our patient had so-called tubercular disease of the lung? We have no proof of it. Absolute proof of disease of the lung can only come from physical examination. I had not examined her before the development of pneumothorax, and we cannot judge accurately of the condition of the lung itself when it is surrounded by air. But she had symptoms of phthisis; she had continued cough for the first six months of last year, and lost flesh; for the rest of the year, though she says she had no regular cough, she sometimes had a little, and a tightness at the top of the right chest.

To the fact that she was told by a physician who examined her in September, that she had no disease of the lung, I do not give much weight, for the examination may not have been a careful one, and we cannot depend upon the statements of patients in regard to physicians' opinions. Although she says that she had no regular cough after summer, I suspect she had, for she had her lungs examined for some reason in September, and took cod liver oil later, I believe.

If phthisis was not the cause of the perforation, what could have been? In subdivision b. we find, besides phthisis, gangrene, diffuse pulmonary apoplexy, hydatids, cancer, emphysema, abscess, rupture in pertussis, and excavated bronchial glands opening into the pleura and bronchi, none of which we have good reason to suspect of being the cause of the perforation in this case, excepting possibly vesicular emphysema.

Gangrene and abscess require perhaps a passing notice, as she says she, after taking medicine, "spit up much thick, offensive matter." I could not elicit that the sputa had the peculiar offensiveness of gangrene, or was in such quantity as would imply the emptying of an abscess.

As she never had the symptoms of the diseases which usually precede gangrene or abscess, I think we may exclude them as a possible cause of the perforation in this case, particularly as the offensiveness and excessive amount of sputa had been long absent.

So, now, the question must be between tubercle and vesicular emphysema. I considered tubercular disease to be the cause of the perforation for the following reasons:—

1. Tubercle is a far more common cause of such perforation than is vesicular emphysema.

2. Vesicular emphysema is very rare in a person of her age, especially one with no hereditary tendencies to it.

3. Vesicular emphysema, though often more marked in one lung, or one lobe of one lung than the other, yet is a bilateral affection, showing itself to some degree on both sides.

There was no evidence of vesicular emphysema of the left lung.

4. She had *symptoms*, before the perforation, of tubercle rather than of emphysema. A cough so slight much of the time as not to attract notice, and the absence of dyspnoea, or anything like asthma, are in marked contrast to the harassing cough, and oftentimes great distress of breathing, common in emphysema.

I wish it to be understood here that I do not deny that there may have been rupture of an emphysematous vesicle, such as is found about a tuberculous deposit, but only that I consider the disease of the lung, which caused cough, &c., a year ago, and which was the ultimate cause of the perforation, to be phthisis and not emphysema.

Considering it probable that the perforation is due to "tubercular" disease, we will next consider the subject of *prognosis*.

We are generally told that the perforation of lung in a case of phthisis is very soon followed by pleurisy with effusion, the case thus becoming one of pneumo-hydrothorax. Considering it probable, then, that this case is soon to become one of pneumo-hydrothorax, what will the prognosis be? The prognosis in this affection is said to be always bad; but it is not equally so in all cases.

The points to be considered are well brought out by Dr. R. Douglas Powell, in the *Medical Times and Gazette*, Feb. 13th, 1869. He writes essentially as follows:—

"The intensity of symptoms in pneumothorax is influenced by—

A. The condition of the lung previous to its rupture.

(1.) The greater or less amount of respiratory area suddenly cut off.

(2.) The increased resistance to the flow of blood through the capillaries of the affected lung.

The greater the amount of healthy tissue left by disease, and hence suddenly collapsed, the greater the disturbance of the equilibrium, if one may use the term, between the aerating power and the blood-volume to be aerated, and hence the more urgent the dyspnoea."

"Although it was proved by Goodwyn, and more lately by Mr. Erichsen, that mere collapse of the lung does not materially affect the circulation through it, and although Mr. Erichsen's experiments tend to show that the cessation of the vital changes of respiration does not retard the circulation through the lung, yet in many cases of pneumothorax the lung is subjected to considerable pressure, and is more completely collapsed than in any of the experiments."

From some of his own experiments, he infers that "there is no appreciable difference in the resistance to the circulation through a moderately expanded lung and one collapsed by its own elasticity."

"When the lung is more completely collapsed there is a decided increase in the resistance to the circulation through it."

"The complete collapse of the lung has a very marked effect in retarding the circulation through it, independently of all external pressure."

"In this way the normal quantitative relation between the two circulations is interfered with, and death would result, but that the systemic veins admit of some, and the portal system of still greater engorgement, by which a certain amount of the surplus blood is temporarily removed from

the general circulation, and time is allowed for more permanent relief, either naturally or by treatment."

"B. The state of the other lung will obviously affect the symptoms, which will be intense and fatal, *ceteris paribus*, in direct proportion to its disease."

"The nature of the opening will affect the symptoms, which will be the more urgent in proportion as the opening is more or less completely valvular.

"The temperament of the patient will influence the amount of shock."

Returning now to our patient, we are warranted in the belief that the amount of disease in the right lung previous to its rupture was slight, and that a large respiratory area was suddenly cut off.

On the other hand, the patient had in her favor the fact that the left lung was free from disease, and fortunately the opening in the pleura was perfectly free, as shown by the constant amphoric respiration.

If I had seen her at the time of the perforation, considering that she had been suddenly deprived of the use of so much lung, I should have predicted intense symptoms; but seeing her twenty-four hours after the accident so comfortable as I have described, with a non-valvular opening, I felt that no urgent symptoms need be expected until after considerable effusion, which I naturally looked for.

The condition, progress, duration, and probable termination I put thus in my own mind. She has suffered a serious accident, and has borne the shock of it much better than could have been expected. She will in all probability recover from the immediate effects of the accident, but liquid will be effused, and air and liquid will remain in the chest for an indefinite time, causing dyspnoea on exertion. It is possible for the opening to close and the air to disappear, or the air and liquid, if it should happen after effusion has taken place; but it is not probable. Finally, disease will probably attack the left lung, and thus the patient will ultimately succumb.

For treatment much less was necessary in this patient than is often required. She took quinine, beef-tea, a little wine and an occasional cathartic, and after a few days whatever food she desired.

If I had not made up my mind that there was almost no chance for the opening in the pleura to become closed, I should have in the beginning applied adhesive plaster to the affected side to prevent motion as far as possible.

*Progress of the Case.*—I saw the pa-

tient at first every day, and afterwards at intervals of a few days for two or three weeks. In a few days she suffered none from dyspnoea, and was able to be about the house. She complained only of weakness. She had no cough. She then moved to a distant locality. I had never found any signs of pleural effusion. The last time I saw her before her removal, the amphoric respiration was less distinct, but still evident.

April 1st.—I visited her. She experienced a very little dyspnoea on exertion, but occasionally had a feeling of tightness across the top of the chest. She had no cough in the morning; occasionally a little in the afternoon. She complained a good deal of weakness.

On examination of the chest, I found percussion normal. Respiration vesicular throughout both lungs; somewhat less intense at lower part of right lung. Vocal signs normal. On cough, very numerous fine, moist râles were heard from the right clavicle to the third rib on that side.

The perforation had evidently been closed and the air absorbed from the pleural sac, but there was evidence of phthisis at the right apex. As there is slight dulness on percussion, more bronchial element in the respiratory murmur, and more resonance of the voice in health at the right apex, compared with the left, in making a diagnosis of incipient phthisis in this region we are obliged to depend upon the signs of secondary bronchitis, viz., the moist râles, and as these were heard over a circumscribed space at the summit of the chest, we are justified, considering the symptoms previous to the perforation, in inferring the existence of phthisis.

I ordered her to lead an indolent life, to devote herself principally to eating, drinking and sleeping, to keep in the open air as much as possible, to take such exercise only as she could take without much fatigue, and to take, an hour after breakfast and an hour after tea, 3i. cod-liver oil with whiskey.

I saw her on the 28th of April. She was then able to walk a mile without rest and without subsequent fatigue. She had no cough, but a little dyspnoea on going up stairs. She complained still of weakness and of loss of appetite. The physical signs remained as at last report. I ordered her to resume the quinine, which had been suspended several weeks before, and to continue the cod-liver oil and whiskey.

The case is interesting, because—

1. Perforation of the pleura in a case of

phthisis was not followed by pleural effusion. I do not remember having seen any record of such a case.

Can we find any reason why effusion did not occur?

Effusion in these cases is considered by many to be dependent on the irritation of the pleura by liquefied tubercle rather than on the irritation of the air. Now this case was incipient and rather latent, and had not probably advanced to softening, so the pleura was not liable to irritation from this source. This seems to me the most probable reason why effusion did not occur.

2. Perforation of the pleura in a case of phthisis became closed, and the signs of pneumothorax disappeared in less than two months after the accident.

This was probably due to the fact that effusion did not occur.

3. The symptoms immediately after the perforation were quite light, when we should have expected them to have been intense, as the patient was suddenly deprived of a large respiratory area. If there had been reason to suppose very extensive disease of the right lung previous to the pleural rupture, then we should not have expected the sudden admission of air to the pleural sac to have been followed by urgent symptoms, because the system would have been previously deprived of the use of much of the lung-tissue. But in this case there was every reason to suppose that the disease was not extensive.

The key to a proper prognosis in regard to the urgency of symptoms, or the progress and termination, in cases of pneumothorax, has not yet been found, but I consider in this case that the lightness of symptoms was due, in a great measure at least, to the existence of a very free communication between the pleural sac and bronchi, so that there was mere collapse and not compression of the lung.

In this case (i. e. collapse without compression), according to the experiments of Goodwyn, Erichsen, and Powell, there would be no interference with the circulation, to which in cases of pneumothorax much of the intensity of symptoms is probably due.

4. It proves that much liquid is not necessary for the production of the physical sign known as metallic tinkling.

There was probably a little bubbling of mucus about the perforation, but not the slightest evidence of any liquid at the bottom of the pleural sac.

The treatment of this case was fortunately very simple, but as it should not

always be so, it may be well to run over here the general line of treatment which it may be proper to pursue.

1. Prevent motion in the affected side by adhesive plaster.

2. Relieve shock by opium, especially subcutaneous injections, and alcoholic stimulants. Without these we may have fatal syncope. But if the patient is strong, and seen early, bleeding may be properly resorted to. Walsh says:—"The quantity of oxygenating surface has been suddenly reduced, and the sudden disparity between that surface and the mass of the blood might, or must, I think, be somewhat lessened by diminishing the quantity of the latter. Whether this be the explanation or not, venesection does give very notable relief, and renders subsequent inflammation of the pleura less violent." Cupping, dry cupping, blisters, cannabis Indica, belladonna, stramonium, aconite and musk have also proved useful in relieving dyspnoea.

3. When there is much interference with the circulation, give hydragogue cathartics to relieve the venous congestion, and if the non-affected lung is encroached upon, and there is danger of asphyxia, puncture the chest and relieve the compression of lung.

4. Sustain the patient by a nutritious diet.

## Reports of Medical Societies.

OBSTETRICAL SOCIETY OF BOSTON. SECRETARY,  
DAVID F. LINCOLN, M.D.

APRIL 10th, 1869.—The Society met at the house of Dr. Putnam, at 7½, P.M., the President, Dr. Buckingham, in the chair.

Dr. CORTING reported the following case.

Mrs. — had a good labor, her first. The milk was secreted well. On the 11th day the nurse gave—for what she thought insufficient lochial discharge, though normal in quantity—a hot injection of fennel-seed tea. The patient immediately uttered a shriek; a terrific rigor followed; and then convulsive vomiting, pains in the limbs, lasting all day, excessive rapidity and feebleness of pulse, tympanites and tenderness of the abdomen. Three dejections, with much pain. The lochial discharge remained slight. The next day, she was better; recovery speedy. "What did the injection do?"

Dr. BUCKINGHAM reported the case of a young woman, confined with her first child six weeks ago. The subsequent flow was

slight, but very offensive. About four weeks after labor she was making very slow improvement; and as the offensive discharge was considered to be in part the cause of her unfavorable state, an injection was ordered—of blood-warm water, with a little salt—per vaginam. Its administration was immediately followed by a violent pain in the uterus, extending over the whole abdomen. A drachm of McMunn's elixir was given, and in three hours she fell asleep. Next day she was as well as ever, and the discharge had ceased. Two days ago he tried to give an enema to the baby, to relieve constipation. He found he could not fill the syringe; and unscrewing the instrument, discovered that one valve was gone. The nurse remarked "that it was *very hard to fill the baby*" with that syringe. It was a new instrument, and was the same which had been used for the vaginal injection of the mother. Probably air instead of water had been pumped in considerable quantity into the mother's vagina, and very likely into the uterus.

Dr. CORTING said that the instrument used in his case was a good one, and the injection of air quite improbable. He did not, however, see what greater harm would be produced by air alone than by the fluid, if injected as described.

Dr. SINCLAIR mentioned a case where by direction he injected with a flexible catheter a solution of tannin for menorrhagia, into a uterus which had elongated to seven inches over a mural fibrous tumor. Pain resembling that of labor instantly ensued, extending to back, abdomen and thighs. Has never since injected the uterus in similar circumstances, though he apprehends no trouble if before injection the cavity were sufficiently dilated. He stated further that air injected with a rectal enema often caused much pain; to avoid which, he cautions that the air be expelled from the syringe by completely filling it before inserting the nozzle into the rectum.

*Death of the Fœtus shortly before labor, in a household attacked with well-marked Measles; the Mother remaining strong and well.*—Dr. REYNOLDS reported the case.

Q. L., aged 34, a healthy woman, in fine bodily condition, was approaching the close of her fifth pregnancy. Three and a half weeks before labor a child seven years old had well-marked measles. Two weeks later the oldest, nine years, was attacked with the same disease. One week before delivery the foetal movements, which had been for some days losing force, wholly ceased. The child, a large, well-developed male, was