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*THE SURGICAL TREATMENT OF EMPYÆMA.*¹

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DURING the last eighteen months I have treated six cases of empyæma following pneumonia, all of which have made perfect recoveries. The patients varied in age from three to thirty-five years. I reported the clinical histories of three of the cases in a paper read before the Southern Surgical and Gynecological Association in 1889, and I trust that, in presenting them again in connection with others, they will not fail to be interesting. Besides, every case of empyæma presents its own clinical phenomena, consequently no single line of treatment can be invariably adhered to. It is a disease that any practitioner of medicine is likely to encounter, and with which we must deal promptly; therefore much more valuable information may yet be acquired by carefully studying the clinical history of each case.

The plan of treatment known as the surgical treatment is the one which has always been most successfully employed. Spontaneous cures are so rare that surgical interference is the rule. Powell

¹ Read before the Southern Surgical and Gynecological Association, November 13, 1890.



has well said, and nearly all writers concur with him, that

“the spontaneous disappearance of such effusions is too uncommon to be expected, and the process of re-absorption is one too full of peril to be anticipated with anything but dread. It is indeed an attempt at such absorption that occasions the most characteristic hectic symptoms. Consequently the prognosis is practically hopeless without surgical interference. We must adopt some surgical measures or take upon ourselves the responsibility for a large mortality.”

There are many modes of operating for the removal of pus from the pleural cavity, but they may be classified as follows under two general headings:

First. The closed method, which consists in removing the pus by simple puncture with a trocar or an aspirator-needle, and allowing the puncture to heal at once. This method was taught in the school of Hippocrates and described in the writings of Galen, but, until quite recently, was practised only as a last resort.

Second. The open method, which consists in making a more or less free incision and the introduction of a drainage-tube to maintain the perfect evacuation of the fluid, to permit irrigation, and to promote free ingress and egress of air that has passed through an antiseptic dressing. The surgical treatment then being an absolute necessity, we cannot over-estimate the importance of making the diagnosis certain by resorting to exploratory puncture with a hypodermic syringe. We can assure the patient that no harm can result from the procedure, and that the prognosis depends upon this means of settling the diagnosis.

In performing thoracentesis, some form of modern aspirator should be used. The patient should be prepared for the operation by administering an alcoholic stimulant, and, if an adult, a dose of morphine hypodermically; if a child, the camphorated tincture of opium by the mouth. By these measures the shock, caused by the introduction of the needle, is diminished, as are the cough, pain, and dyspnœa, which are so liable to follow the sudden withdrawal of the fluid and the subsequent expansion of the lung. The needle should be thoroughly cleansed and disinfected, and the point on the chest-walls at which the puncture is to be made should be thoroughly scrubbed with soap and water and bathed with an antiseptic solution. An anæsthetic cannot be considered as absolutely necessary.

J. Lewis Smith and a few other writers do not think that it is necessary to remove all the pus, but I think that we should remove as much as is possible, lest fistulous openings be formed through the walls of the chest, or through the lungs. Still it should not all be removed, if pain and dyspnœa be complained of, for the operation can be completed on the next day or within a few days.

I have performed thoracentesis one hundred and sixty-eight times, and have had no trouble from it, except slight pain and temporary dyspnœa.

As to the number of aspirations that should be made before resorting to the open method, there are many different opinions. I think, however, that the decision should depend almost entirely upon the character of the fluid and the physical condition of the patient. To illustrate this, I will refer

for pus

to my own cases. The first case, aged seven years, was cured after eleven aspirations. The second, aged seventeen years, after one aspiration. The third, a man thirty-five years of age, after two aspirations. The remaining three were not cured by aspiration; one of them, aged twenty years, was aspirated seventy-three times; another, aged three years, was aspirated ten times; and the last one, aged eight years, was aspirated seventeen times before thoracotomy was performed. It is stated by almost all writers that when the fluid becomes foetid incisions should be made, and I believe that the character of the fluid should govern us, to a great extent, as to when we should abandon thoracentesis and resort to thoracotomy. Still, in one of my cases, the pus was foetid at the forty-fifth aspiration, and the foetor had disappeared at the forty-ninth. The physical condition of this patient, while the pus was foetid, was in no way worse than it was just before or afterward, and, as has been stated, aspiration was done seventy-three times before thoracotomy was performed. This record, in connection with the opinion of other operators, is certainly sufficient to establish the fact that thoracentesis should always be given a fair trial in any case of purulent pleurisy, before the open method is resorted to.

During thoracentesis the sitting posture must be assumed by the patient, unless there is great feebleness, when the recumbent posture may be allowed. I removed thirty-two ounces of pus from one of my patients while he was in the recumbent posture, the needle being introduced between the fourth and fifth ribs in front. The pus seemed to flow as

rapidly as though the patient were in the erect position.

I wish to call special attention to the condition of patients just after the operation of thoracentesis. The histories of my cases illustrate this condition very forcibly, nevertheless I mention it here. Take, for example, a patient aged from three to eight years, with the physical signs of empyæma, a temperature of 103° F., pulse from 120 to 160, and the respirations from 30 to 60 per minute. Remove the pus by aspiration, and the following morning the temperature will be very near the normal standard, or perhaps a little subnormal, and, if recovery is to take place from this operation, the pulse and respirations will also be very nearly normal, with but slight elevation on the following evening. If, however, there is to be a re-accumulation of the pus, and hence a necessity for repeating the aspiration, the temperature will be nearly normal or perhaps subnormal, but the pulse will remain at from 100 to 130, and the respirations from 40 to 60 per minute. From observations made during the progress of my cases, I have found that the rapid respiratory movement is the last symptom to disappear, and that there is no certainty in the success of the operation until the pulse and respirations fall with the temperature.

The three cases cured by aspiration had a pleuro-bronchial fistula, and two of them expectorated large quantities of pus. The third never expectorated pus, but there was always considerable escape of air into the aspirator after the pus had ceased to flow, proving that a pleuro-bronchial fistula existed.

In one of these cases, aged thirty-five years, the right arm was elevated during the operation, thereby elevating the scapula from its normal position, and the needle was introduced between the sixth and seventh ribs under the scapula, consequently, when the arm was lowered the scapula descended and covered the puncture made by the needle through the subscapular tissues.

The physical condition of the patient should be our principal guide in resorting to the operation of thoracotomy. In other words, thoracentesis should be adhered to, unless we see great emaciation and hectic symptoms. Another condition under which I would urge the operation of thoracotomy, is where perforations through the lung are threatened, since the most serious complication of empyæma is a pleuro-bronchial fistula.

In order to perform the operation of thoracotomy a general anæsthetic must be used. I am partial to ether carried to complete anæsthesia. The operation can then be performed carefully, the drainage-tubes adjusted with precision, and the antiseptic dressing applied without inflicting pain. The point selected for making the incision should be thoroughly cleansed, the tissues divided down to the pleura with a bistoury and a grooved director thrust into the pleural cavity, when the pus will begin to escape along the groove. The incision should then be made large enough in the adult to admit the index-finger, and in children lengthened to the extent of at least one inch to permit free escape, not only of the fluid, but of any fibrous masses or organic débris that may be present, which

are apt to undergo decomposition and thereby produce septicæmia and death.

It is stated by almost all authors that there is no danger of the pus escaping too rapidly, since air will enter in its place and equalize the pressure. I have not found this to be true. In two of my cases I was forced to close the incision and stop the flow of pus by introducing my finger, and subsequently a tent, to relieve the cough and dyspnœa brought on by the sudden withdrawal of the fluid. This being the case, I think that it would be extremely hazardous suddenly to evacuate the fluid by incision, and immediately irrigate the pleural cavity, even if the pus were fœtid. The success of the operation depends upon the free ingress and egress of air that has passed through an antiseptic dressing, and it should be plainly heard passing through the tubes at each act of forced expiration.

The object of using irrigation is said to be to rid more completely the pleural cavity of the elements of decomposition, and thereby favor obliteration of the abscess cavity, by allowing the pleural surfaces to grow together by granulation. Therefore, if irrigations are employed, it is very important to use no force in carrying the fluid into the pleural cavity, since delicate and important granulations and adhesions may be broken up.

As soon after the operation as the condition of the patient will permit, two pieces of one-fourth inch drainage-tube should be introduced in such a manner as merely to project into the pleural cavity, and cut off about one-fourth of an inch from the

external surface of the chest; then the antiseptic gauze dressing should be applied.

If the ribs are so close together that drainage cannot be maintained through a simple incision and rubber tubes, or if, from inexpansiveness of the lung or any other cause, the pleural cavity fails to become obliterated, the old operation of resection of ribs affords the best chances for thorough evacuation of the fluid and subsequent drainage.

At a recent meeting of the German Congress of Internal Medicine, the surgical treatment of empyæma was pretty thoroughly discussed, and to show the general plan adopted by those who took part in the discussion, I will give a synopsis of what was said :

“ In the first place, it was agreed by all that some kind of surgical interference was indicated, except in very rare instances,

“ Professor Immermann opened the discussion and stated, first of all, that the pus must be evacuated by operation; and next, that simple aspiration will not answer except in small empyæmata, which of themselves would become absorbed. The plan recommended by Bulau was spoken of most favorably. Immermann collected 49 complete cures out of 57 cases. It was not suitable, however, for cases of inexpansive lung, pyopneumo-thorax, or pulmonary fistulæ.

“ Dr. Schede, of Hamburg, took the surgeon's view of the matter, and advised the radical operation, *i. e.*, resection of rib. Bulau's operation he thought much less safe than resection.

“ Dr. Curschmann, of Leipsic, has treated all cases in the past ten years by Bulau's method. Among 73 cases 89 per cent. were cured and 6 died.

“ Professor Leyden spoke favorably of Bulau's method.

“ Dr. Ewald, in 1874, had collected statistics in Frerich's clinic of 109 serous and 46 purulent cases, and had then concluded that of 1000 cases 928 do not get well with simple puncture, while 528 are cured by

radical operation. The results of surgery to-day are much better than that. In the present year he had, with Koster, operated with the double incision in 9 cases, with 1 death from rapid tuberculosis. The operation was done as soon as the nature of the case was proved. The objections arising from the old cases would be obviated if early interference were the rule.

"Professor von Ziemssen, of Munich, had for ten years past treated all empyæmata by incision and rib resection, and was perfectly satisfied with this method.

"Dr. Mosler, of Greifswald, advised, after the operation, washings with boric acid, and then injections of iodoform and glycerin.

"Dr. Runeberg, of Helsingfors, treated all empyæmata by rib resection, and did not wash out. He had thus dealt with 63 cases, of which two were still under treatment. Two were manifestly tuberculous, 10 were due to pulmonary gangrene, 49 were simple empyæmata. Of these latter, 46 were completely healed, in 2 fistulæ remained, 1 case died from erysipelas. The average duration of treatment was forty-eight days.

"It will be noticed that the opinions of all who took part in the discussion were divided between Bulau's method and rib resection. Simple incision with the introduction of drainage-tubes was not advocated by any of them. Nearly all thought that injections were useless."¹

Now, the plan of making free incisions and introducing drainage-tubes is frequently successful in this country, and I do not believe that rib resection should ever be resorted to, except in cases in which perfect drainage with free ingress and egress of air fails to be accomplished by simple incision, and in cases in which the cavity fails to become obliterated, from an inexpandive lung or from any other cause. In such cases the removal of a considerable portion of rib weakens the thoracic walls,

¹ Medical Record.

and thereby favors retraction of the chest and obliteration of the pus-cavity.

In all of my cases it was evident that the pleural cavity was almost obliterated within the first two or three days after thoracotomy was performed, and, instead of producing dyspnœa and cyanosis, these symptoms rapidly disappeared after the operation.

I am satisfied that irrigations cannot be used with safety, since there have been many instances of sudden death directly attributable to them. Loomis states that he has thrice had good reason to attribute sudden death to the direct effect of washings. Sir Joseph Lister also advises against irrigation. Consequently I do not believe that it should be practised unless there are symptoms especially demanding it. It is admissible when the discharge is very chronic, and continues in spite of free drainage, and when there are symptoms which threaten septicæmia. I used irrigations of warm water in all of my cases, and am convinced that they are irritating and injurious during the first two or three weeks following the operation.

In one of my cases, aged twenty-one years, the tube accidentally dropped out too early, and there was a re-accumulation of the pus and enlargement of the abscess cavity. Weak solutions of iodine (four or five grammes each of iodine and iodide of potassium to the pint of warm water that had been boiled) proved to be very beneficial. The discharge was checked at once, and the pus-cavity quickly obliterated.

To illustrate the subject further, I will report the following cases:

CASE I.—Carl R., male, aged seven years. Had influenza, complicated by pneumonia, in March, 1889. On April 27th, pulse 98, temperature $99\frac{1}{2}^{\circ}$, decided dulness over the right side of the chest. Removed by aspiration 4 ounces of pus.

May 2. Pulse 102, temperature $102\frac{1}{2}^{\circ}$; removed 8 ounces of pus from between seventh and eighth ribs in the axillary line.

5th. 9 A. M., pulse 110, temperature $99\frac{1}{5}^{\circ}$; has considerable cough with some expectoration; removed 4 ounces of pus.

8th. Pulse 115, temperature $100\frac{4}{5}^{\circ}$; removed 6 ounces of pus.

9th. Pulse 76, temperature 98° , respirations 36; slept well last night, calls for food.

10th. Pulse 100, temperature $99\frac{3}{5}^{\circ}$; removed 3 ounces of pus.

11th. Pulse 96, temperature $98\frac{2}{5}^{\circ}$, respirations 36; takes plenty of nourishment.

12th. Pulse 100, temperature $99\frac{1}{2}^{\circ}$; has taken too much food and is passing blood from the bowels.

15th. Pulse 110, temperature $99\frac{2}{5}^{\circ}$, respirations 40; removed 1 ounce of pus.

17th. Pulse 115, temperature $102\frac{1}{5}^{\circ}$, respirations 40; removed $3\frac{1}{2}$ ounces of pus.

18th. Pulse 100, temperature 99° ; much more comfortable.

19th. Pulse 118, temperature $102\frac{3}{5}^{\circ}$; removed 3 ounces of very thick pus.

21st. Pulse 90, temperature $98\frac{1}{2}^{\circ}$, respirations 30; removed 1 ounce of pus.

23d. Pulse 120, temperature $100\frac{1}{5}^{\circ}$; removed 1 ounce of thick pus.

28th. Pulse 100, temperature $98\frac{3}{5}^{\circ}$, respirations 24.

30th. Pulse 84, temperature 98, respirations 22. From this time he made a rapid and complete recovery. There were in all eleven operations performed, and at each operation air escaped freely into the aspirator through a pleuro-bronchial fistula after the pus had ceased to flow.

CASE II.—E. R., male, aged seventeen years. Had influenza and pneumonia, followed by abscess of the lung, which discharged large quantities of pus by expectoration, from April 10 to May 28, 1889. On May 29th cough had entirely ceased, pulse 110, temperature 100° ; circumscribed dulness over the abscess cavity about the middle of the left side of chest. Removed by aspiration about six ounces of very offensive pus—all that would flow through the instrument. There was no cough or distress of any kind when the operation was completed, but cough began in an hour afterward, and he expectorated eight or ten ounces of very offensive pus within the next twelve hours.

May 30. 8 A. M., pulse 88, temperature $98\frac{1}{2}^{\circ}$; expectoration has entirely ceased and the patient is very comfortable.

30th. 7 P. M., pulse 84, temperature $97\frac{1}{5}^{\circ}$; still no expectoration. Great retraction of the chest-walls in the locality of the abscess.

June 8. Pulse 80, temperature $98\frac{1}{2}^{\circ}$.

He made a complete recovery.

CASE III.—W. R., male, aged twenty years. Had influenza, and on March 16, 1889, had a chill followed by pneumonia of the right lung. There was no decided crisis, and on April 12th I removed 13 ounces of pus from between the seventh and eighth ribs in the axillary line. At this time his pulse was 92, temperature 101° , respirations 30. The cough had ceased. When the thirteen ounces of pus were removed he had some pain and dyspnoea, and the operation was ended.

April 14. Pulse 90, temperature $99\frac{1}{3}^{\circ}$. Has slept well since the operation.

15th. Pulse 96, temperature $99\frac{1}{3}^{\circ}$. Is obliged to take morphine to procure sleep. I removed 6 ounces of pus, when the operation had to be terminated.

16th. Pulse 84, temperature $99\frac{4}{5}^{\circ}$. Has slept well since the operation.

18th. Pulse 92, temperature 100° , respirations 50; symptoms of re-accumulation. Removed 32 ounces of pus; the puncture was made in front, between the fourth and fifth ribs, the patient lying on the back.

19th. Pulse 80, temperature $98\frac{1}{2}^{\circ}$, respirations 22. Is very comfortable.

July 15. Forty-five aspirations have been performed, and 351 ounces of pus have been removed.

16th. I removed 8 ounces of very offensive pus. Thoracotomy advised, but the patient would not consent to the operation.

When the forty-ninth operation was performed the fœtor had entirely disappeared. Aspiration was repeated until the seventy-third operation, when 500 ounces of pus had been removed.

September 14. Pulse 112, temperature $98\frac{1}{3}^{\circ}$. The operation of thoracotomy was performed, ice being used as a local anæsthetic. The incision was made in front because the pus was pointing there. Five or six ounces of pus escaped, a soft rubber drainage-tube was introduced, and the dressing applied, which consisted of several layers of antiseptic gauze. About 2 ounces of pus were discharged daily until October 1st. At this time his pulse was 110, temperature 100° , and I commenced to irrigate the abscess cavity.

November 1. Pus cavity has been irrigated since October 1st, and now holds only a drachm or two of fluid.

8th. The tube is still in place and the patient is able to walk a mile or two. From this time he made a complete recovery.

CASE IV.—John G., male, aged thirty-five years. Developed pneumonia on April 10, 1890. I saw him in consultation with Dr. G. C. Radford on May 22d. He then had been expectorating large quantities of pus. His temperature on May 20th and 21st, was 102° ; when I saw him his temperature was $98\frac{1}{2}^{\circ}$, pulse 84, and respirations 24. There was circumscribed dulness about the lower angle of the scapula; I elevated the scapula and removed 5 ounces of pus from between sixth and seventh ribs.

May 23. Temperature 100° , pulse 72, respirations 22.

24th. Temperature 99° , pulse 72, respirations 22; removed 12 ounces of pus from under lower angle of the scapula. No distress of any kind followed the operation.

June 1. Temperature $98\frac{1}{2}^{\circ}$, pulse 85. On June 4th and 5th, he expectorated a considerable quantity of pus.

8th. Temperature $98\frac{1}{2}^{\circ}$, pulse 72, respirations 20. From this time he made a complete recovery.

CASE V.—Katie W., female, aged three years, was taken with pneumonia on February 13, 1890. I saw her in consultation with Dr. Onslow Regan on March 29th, temperature 102° , pulse 140, respirations 40. I removed 7 ounces of pus by aspiration.

March 30. Temperature $97\frac{1}{2}^{\circ}$, pulse 112, respirations 40.

31st. Temperature $101\frac{1}{2}^{\circ}$, pulse 130, respirations 48. Removed 5 ounces.

April 1. Temperature $98\frac{1}{2}^{\circ}$, pulse 104, respirations 36; patient comfortable and playful.

3d. Temperature 103° , pulse 150, respirations 50. Removed 6 ounces of thin pus.

5th. Temperature 97° , pulse 110, respirations 40; patient very comfortable.

6th. Temperature 101° , pulse 150, respirations 50. Removed 6 ounces of pus from between the fifth and sixth ribs, in the axillary line.

7th. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 36.

11th. Temperature $101\frac{1}{2}^{\circ}$, pulse 140, respirations 48; considerable cough and expectoration, but patient swallows the pus.

13th. Temperature 102° , pulse 140, respirations 48.

15th. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 40; expectorating and swallowing large quantities of pus. Pus-cavity completely emptied by the pleuro-bronchial fistula.

19th. Temperature 101° , pulse 140, respirations 48; expectoration has ceased, and there are evidences of re-accumulation of pus in the pleural cavity; I removed by aspiration 18 ounces of pus.

20th, 9 A. M. Temperature 99° , pulse 130, respirations 30. 6 P. M. Temperature 100° , pulse 130, respirations 50; considerable cough, but no expectoration. Eleven operations have been performed, and air escaped freely into the aspirator through a pleuro-bronchial fistula, after the pus had ceased to flow, at each operation.

Performed thoracotomy under ether carried to complete anæsthesia. Incision made in the axillary line between the sixth and seventh ribs. About one pint of pus escaped, air was freely admitted in its place, but cough and dyspnœa supervened, and a tent was introduced to prevent complete evacuation of the fluid.

21st. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 30; removed the tent, and one pint of pus escaped. A single one-quarter-inch soft-rubber drainage-tube

was introduced, a dressing applied, and air freely admitted.

24th. Temperature 98° , pulse 120, respirations 24.

26th. Temperature 98° , pulse 120, respirations 24; has dysentery, caused by having swallowed the pus.

May 1. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 24; about 1 ounce of pus is being discharged per day through the tube.

6th. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 24; only 2 or 3 drachms of pus escaping per day.

10th. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 24; very comfortable; was carried on the streets in her carriage.

31st. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 24; pus-cavity has been irrigated since May 17th; now discharging 1 ounce of pus per day; washings discontinued.

June 8. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respiration 24; has been able to stand on her feet for several days; still wearing the tube.

17th. Tube removed, and patient discharged cured.

CASE VI.—Maxwell G., male, aged eight years, was taken sick with pneumonia, March 23, 1890. There was no decided crisis, and on the fourteenth day after the chill his temperature was 100° , pulse 130, respirations 48.

April 6. Temperature 101° , pulse 120, respirations 40.

7th. Temperature $100\frac{1}{2}^{\circ}$, pulse 125, respirations 50. Removed 6 ounces of pus by aspiration from the right pleural cavity; the needle was introduced between the fifth and sixth ribs in the axillary line.

9th. Temperature 100° , pulse 130, respirations 48. Removed 3 ounces of pus.

10th. Temperature 99° , pulse 125, respirations 40.

12th. Temperature 101° , pulse 130, respirations 48. Removed 4 ounces of pus.

13th. Temperature 99° , pulse 120, respirations 36.

14th. Temperature $102\frac{1}{2}^{\circ}$, pulse 130, respirations 48. Removed 2 ounces of pus.

15th. Temperature $98\frac{4}{5}^{\circ}$, pulse 116, respirations 36.

17th. Temperature $101\frac{4}{5}^{\circ}$, pulse 120, respirations 48. Removed 4 ounces of pus.

18th. Temperature $98\frac{1}{2}^{\circ}$, pulse 100, respirations 40.

20th. Temperature $100\frac{1}{2}^{\circ}$, pulse 120, respirations 48. Removed 4 ounces of pus.

26th. Temperature 102° , pulse 130, respirations 50. Removed 2 ounces of pus.

27th. Temperature $99\frac{1}{2}^{\circ}$, pulse 130, respirations 40.

28th. Temperature 100° , pulse 120, respirations 40. Removed 2 ounces of very thick pus.

May 1. Temperature 98, pulse 112, respirations 32.

6th. Temperature 100° , pulse 120, respirations 48.

9th. Temperature $98\frac{1}{2}^{\circ}$, pulse 110, respirations 40.

14th. Temperature 99° , pulse 120, respirations 40. Removed 2 ounces of pus.

15th. Temperature 98° , pulse 100, respirations 36.

21st. Temperature $98\frac{1}{2}^{\circ}$, pulse 132, respirations 50. Removed by aspiration 8 ounces of pus.

22d. Temperature $102\frac{1}{2}^{\circ}$, pulse 152, respirations 50.

23d, 9 A. M. Temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 40. Performed thoracotomy under complete anæsthesia from ether. A large quantity of pus escaped, together with solid fibrous masses and débris. A severe cough and dyspnœa set in before

the pus-cavity was emptied, and the incision was closed by introducing a tent. At 8 P. M., temperature $98\frac{1}{2}^{\circ}$, pulse 120, respirations 40.

24th. Temperature $98\frac{1}{2}^{\circ}$, pulse 100, respirations 35. Removed the tent from the incision, when several ounces of thin fluid escaped. Two pieces of one-fourth inch soft-rubber drainage-tube were introduced into the incision side by side.

25th. Temperature $98\frac{1}{2}^{\circ}$, pulse 90, respirations 32; air passes freely into and out of the pus-cavity through the tubes, and several ounces of serous fluid have escaped.

28th, 9 A. M. Temperature $98\frac{1}{2}^{\circ}$, pulse 110, respirations 36; 6 P. M., temperature 100° , pulse 130, respirations 48.

June 6. Temperature $98\frac{1}{2}^{\circ}$, pulse 90, respirations 30; able to sit up in bed.

15th. Up and walking about the room. I removed the tubes. From this time he made a rapid recovery.

In such cases as those reported some time ago by Dr. G. Frank Lydston, in the *Western Medical Reporter*, aspiration would hardly be indicated.

These cases are of a very interesting and exceptional character, and I will briefly report them in Dr. Lydston's own words:

"These cases I observed some years ago at the New York Emigration Hospital, and, for want of a better term, I have called it acute empyæma or acute suppurative pleurisy. The patient, a stout, powerfully-built Scandinavian, was sent to Ward's Island from Castle Garden immediately after landing, and without examination or diagnosis. As my interpreter was absent, I postponed a thorough examination of the patient until the following morning, making the provisional diagnosis of pleurisy with effusion. The temperature was 104° in the axilla. I was called away from the hospital the follow-

ing morning, and upon my return in the afternoon I found the patient in a dying condition. He lived only an hour after I saw him. On post-mortem examination I was astonished to find the right side of the chest distended with pus of an exceedingly foetid character; the lung was compressed against the mediastinum. When stripped off it formed a layer not exceeding an inch in thickness. So firmly was it compressed that I was at first at a loss to know what had become of the lung. The purulent fluid nearly filled an ordinary ten-quart milk-pail. All the other organs were in a healthy condition. The patient had only been sick about two weeks, as he was taken ill after getting aboard the steamer bound for America. This case was evidently of an infectious character, and probably the result of secondary infection, but I have no idea as to what might have been the primary difficulty.

"In this case a preliminary tapping would have been good practice, but sooner or later a free incision, with drainage, would have been necessary.

"The second case was that of an elderly woman, who developed empyæma secondary to pleurisy with effusion. The origin of the difficulty was unquestionably tubercular. The effusion subsided readily, but after a few weeks a rise of temperature, chills, and increase of pain heralded the formation of pus. It was about three weeks before I was able to detect the location of the purulent inflammation. I finally, however, mapped out an area of dullness, about the size of a silver dollar, at the level of the ninth and tenth ribs, about four inches from the spinal column. Aspiration proved the existence of pus. A modified Estlander's operation was performed, with the excision of about two inches of the tenth rib. On passing the finger into the track of the pus it was found to lead to a considerable sacculus between the inner surface of the lung and the mediastinum. Free drainage was instituted, and the cavity closed in about eight weeks. Several months later a swelling appeared upon the thorax at the junction of the third and fourth costal cartilages with the sternum. This finally opened and discharged a considerable quantity of pus. Operation was refused. The patient finally died, apparently from the prolonged suppuration rather than from the tubercular process in

the lungs, which, contrary to expectation, progressed very slowly.

"The third case of interest was very similar in some respects to the preceding. The patient, a man of middle age, previously healthy and strong, had been suffering from acute pleurisy for four or five days. On examination I found that tapping was not yet necessary, but suggested that it might be advisable later on. Three weeks later I again saw the patient, but the effusion, which, Dr. Walker informed me, had apparently been considerable, had almost entirely been absorbed. About a week later an irritating cough came on, and the temperature, which had become normal, again rose quite suddenly, but subsided in less than a week. The patient now began to expectorate a fœtid, purulent sputum; diarrhœa also set in. The severe cough and inability to sleep in the recumbent posture proved very annoying.

"On examination I found an area of dulness on percussion in about the same location as in the preceding case, and, bearing this case in mind, I diagnosed sacculated empyæma between the lung and the mediastinum. The same operation was performed as in the preceding case. A large quantity of pus, of a very offensive character, escaped; the odor was that characteristic of rotten eggs. The expectoration of the antiseptic fluid used for irrigation showed that the sacculus communicated with the bronchi. The case has done well since the operation, and is in a fair way to recover. The cough and diarrhœa have improved, and an excellent appetite has developed. As there is no appearance or history of tuberculosis in the case, the prognosis is apparently favorable."

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