Thesis
for
The Degree of Doctor of Medicine
of the
University of Glasgow
The Treatment of Pleural Effusions
by
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Fiji Islands
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I hereby declare solemnly, that the "thesis" was written by myself unaided, beyond the assistance received from the authorities cited on the opposite page.

Aleps. J. F. M. D. O.
The following is a list of Authorities consulted in preparing this thesis:

Dr. Boisture (Theory of Practice of Medicine)
Dr. Coats (Manual of Pathology)
Dr. Harey (Paper on Pleural Effusions in the "Lancer", Feb. 1886)
Dr. Quain (Dictionary of Medicine)
Dr. Roberts (Practice of Medicine)
Dr. Tennent - Lectures on Pleurisy (Western Infirmary).

The cases, with the exception of three (noted in the text) are taken (with Dr. Tennent's permission) from the journals of the wards under his charge, in the Western Infirmary.

These cases were reported by myself, but as they are very long, I was obliged to make a synopsis of each case except one, which I have given in detail.
The Treatment of Pleural Effusions

I have chosen as the subject of my "Thesis" the treatment of pleural effusions, with the object of advocating early operative interference, and to do so through the criticism of a number of cases, most of which were under my own observation while I was Physician in the Western Infirmary.

I do not intend to discuss the question of diagnosis, for the recognition of the existence of a pleural effusion is generally a very simple matter. The history of the case is usually so characteristic, and the physical signs so easy of appreciation, that the diagnosis of a pleural effusion is rarely overlooked.

In general practice, the position assigned to certain drugs in the treatment of the disease under examination, is a primary one, and then as it were in the order of merit, the use of the aspirator and the free incision into the pleural cavity. First diuretics, diaphoretics &c. are all tried, and when they fail one or other of the operative methods is resorted to.

Before going on to treatment, however, it will be necessary to note some of the consequences of a pleural effusion, for in the consideration of these, and the cases bearing upon them, will be found I think sufficient arguments in favour of early operation.

Among the more important results of effusion into the pleural cavity is pressure upon the lungs and heart.

As is well known, the lung upon the affected side becomes pressed upon and the circulation of blood through its tissues materially obstructed. The lung upon the sound side becomes overworked (in proportion so the
Quain's Dictionary of Medicine - Pleurisy.

other is engiubed), its air pacs became diuindced, the vesels raniifyng in
their walls are pressed upon; and the circulation is again diuinded.
Again, in severe cases, the lung becomes »alminous & congested and
dribly and frothy expectum may a»pear.” The result of all this is in-
sufficient circulatim of hlood, and is one of the causes of the difficulty
of breathing.

Another important factor in the production of dyspnea is the condition
of the heart. It becomes displaced, and its muscular contractions are
considerably impeded, both by the obstruction in the lungs in front, and
the pressure of the fluid behind.

As Dr. Mary pointed ot, “in left pleural effusion the heart is
congerably displaced to the right (the apex beats often being felt away
to the right of the sternum), and there is considerable pressure on the
left auricle (the left being in a much more forced position than the right,
as that pressure upon it will be less easily escaped from by yielding of
the parts around) obstructing the flow of blood from the right heart to the
left, and causing engorgement of the right heart (distending it
latrially and increasing the change to the right) and back ward pressure
in the great veins, and as congestion of the various organs, lungs,
bowel &c.

In pleural effusion in the right side, the heart is displaced to the
depth, and there is pressure on the right auricle preventing the entrance
of blood into the right auricle and reducing the size of the heart,
space that the displacement appears less than in the right side.

Hence the greater the fluid in the right side, the more will be the
pressure on the right auricle, and the greater the reduction in the blood
supply to the heart, and the greater the changes of cardiac anemia, and
This case I received from a medical friend.
death from malnutrition of the heart.

In pleural effusions on the left side, there is danger of the heart
stopping in diastole on account of the engorgement.

Thus in pleural effusions there is danger of death from asphyxia or
collapse, and this in otherwise healthy persons."

The following three cases illustrate, I think, some of these points.

I.

J. S. wr. 70. Seen first, January 7th.

Patient complains of cough, shortness of breath, and cramps in the limbs.
His illness is of two months' duration, due to states, to changing an
indoor for an outdoor occupation.

The early symptoms were preceded by a growing pain in left epigastrium
region, catching his breath, and greatly increased by deep inspiration and
coughing. The pain lasted for two weeks, and then the shortness of
breath came on, and has been gradually getting worse. He now lies in
his left side. Face flushed, and lips slightly livid.

Apoæ beat is found in region of ensiform cartilage, is beating and
diffused over the epigastrium.

Inspection of chest shows bulging of left side, with diminished movement.

Percussion over left base is absolutely dull, and from the base, half
way up the chest—there is increased resistance. The apex in percussion
shows a dull tympanitic note. The R. M. all over the dull area
is altogether absent, while that of the right side is somewhat present.

Summarize voices are heard on right side posteriorly. Temperature
normal.

Jan. 13th. Patient gradually getting worse, and complains of great
difficulty of breathing.
Jan. 14th. Patient died this morning, just as tapping was about to be performed.

Post-mortem showed large quantity of serous, but muddy fluid in the left pleural cavity.

The first point of importance to note in this case is, that the patient had been ill for two months, and as no note is made of the cardiac condition, it may be presumed there was no organic disease of the heart. But considering the patient's age, 70 years, it may be taken for granted that a slight obstruction to the heart would be serious as that organ would not be very vigorous. But the obstruction was great. The left pleural cavity was almost full of fluid, the heart was displaced to the right, there was pressure in the left auricle, causing (as already seen) engorgement of the right heart, and backward pressure on the great veins, and as congestion of the lungs. Etc.

All these were present as we can judge from the symptoms and signs that were, difficulty of breathing, lividity of the lips, leaning, and diffused aper impulse in region of the second, third, and fingers of right side, externally.

The patient was first seen on Jan. 7th (two months after onset of illness), and on the 13th it was found to be gradually getting worse, and complained of great difficulty of breathing. During this time he was treated by laudanum Etc. It was now suggested that the fluid should be withdrawn, but on the following day (14th) patient died "just as tapping was about to be performed."

Here then is a case of left pleurisy with all the signs of cardiac pressure becoming daily more exaggerated, and yet gradual interference
2. "It is also generally believed, and perhaps correctly, that the discharge of a certain proportion of fluid from a distended cavity promotes the absorption of the acid."

(From: "INDEX OF DISEASES", page 395.)
only proposed when the patient was very far through.
In Dr. Jansen's "Index of Diseases," the following directions are given
for the use of the aspirator, "the thorax to be tapped, and the fluid
withdrawn by aspirator whenever suffocation is threatened by an amount of
effusion, or from paroxysms of dyspnea, or when semicidi is said to
produce absorption."
The utter failure of waiting till "suffocation is threatened" before using
the aspirator is suggested by the termination of the case just quoted,
and I hope to be able to show that the proper time to withdraw the
fluid is not when "suffocation is threatened," or "semicidi is said to produce
absorption," but in an earlier stage of the disease to avoid the threatening
of suffocation, and to aid drugs in their action.
To expect drugs alone (diuretics, diaphoretic &c.) to give relief to the
symptoms in the case of a pleura distended with fluid, is to expect
what they are utterly incapable of doing. But in connection with the
aspirator they play a secondary part, by aiding the absorption which is
believed to be promoted by the withdrawal of some of the fluid.

The second case enlists with the above, and as it is a somewhat unusual
one, I may be permitted to give it in detail.

J. B., age 50. Admitted November 29th.
Admitted complaining of great difficulty of breathing, cough, epistaxis,
and weakness. Patient had cancer four 35 years ago. Three weeks ago he
suffered a slight chill, followed by cough, and since then he has been
gradually getting worse. He was admitted in a very bad state, he
had to be supported in bed, his breathing was loud & cough troublesome.
There was abundant frothy, hemoptysis, with (filling three ephines in
24 hours), and the lips were very blue. Pulse 88 per minute, and "water hammer" in character. Respiration 32 per min. & laboured.

A slight oedema of ankles. An auscultation of the chest nothing could be heard but loud continuous rales. A few days in bed left

intervene a little to left of nipple line, left tender of cardiac dulness. Half an inch to left of nipple. An auscultation of this pulmonary condition, the cardiac sounds could not clearly be made out, but it was evident they were un- pure.

Under treatment be improved rapidly, breathing became less laboured, cough improved, and the lung condition cleared up, and on now auscultating the heart, a loud V.S. and V.D. murmur was heard at once, down the stethoscope, and near arctic area.

In the middle of December it was noted that the patient had much improved, and much lessened & though still hommmage over less than on admission, and the breathing was much more easy.

Pulmonary percussion normal. Urine contained no albumen.

January 9. In the 5th Jan: patient complained of pain over right side of chest, and a mustard blister was ordered, giving relief.

Next morning he complained of pain in the axillary region, but on examination nothing could be detected. This evening he again complained of pain, & the chest was again examined, when the following condition was noted.

Dullness exists all over right side front and back, in front, from as high as upper border of 3rd rib, down to hepatic dullness, which is displaced downward nearly to level of umbilicus, whilst behind, dullness exists from pynorrhea opinion from above, to the base of the lung.

The right side of the chest measures 1½ inches more than the left. As
the level of the nipple. Carcinoma slowly spreads to the left, but as the left ventricle is dilated and hypertrophied, this fact is not clearly demonstrated. All over right side R. M. is very feeble and as lower part of chest is almost immobile. In right side V. R. is greatly diminished, and V. F. is totally absent. All through the latter illness there has been no elevation of temperature, and no increase of the pulse.

Jan. 11th. 6 ½ ounces of hemorrhagic fluid withdrawn from right side by the aspirator.


Jan. 16th. 4 ½ ounces hemorrhagic fluid withdrawn. Cough much less, but sputum still hemorrhagic. Face not nearly as much flushed, and patient perspires very little. Breathing still a little troublesome on moving or exertion. Appetite improving.

Jan. 17th. Cough much less, as also sputum, which is now viscid and containing only a little blood (and not almost purely hemorrhagic).

Jan. 19th. Patient rapidly improving, cough & sputum less. Pain in chest much better, and patient can move in bed with comparative ease.

Jan. 20th. Very little pain, cough much better and sputum less, sneeze, froth, and tenacious, with only here and there a little blood. In examining chest there is found to be considerable movement during respiration, and lower part of right lung, but still dullness in person an all over right side but R. M. is slightly stouter.

Jan. 21st. 3 ½ ounces of hemorrhagic fluid withdrawn. Sputum today
fever from blood.

From this time patient was on merest starvatorily, pain became less and less and finally disappeared. Breathing became much more easy, and on Feb 7th patient was allowed up for a little. He was then allowed to walk about the ward, and then permitted to go outside.

Feb 29th. Since last noted patient has been steadily improving, and for the last fortnight has been going about in the open air, and is now up all day. He has almost no cough, and only slight mucous expectoration from mouth, and the sputum has contained no blood since Jan 21st. Pulse 80, Respiration 20, full and easy, and an equal amount of movement on both sides of the chest during respiration. R. Hr. can be heard all over right side but is slightly feeble as compared with the left. V. R. and V. F. almost the same on both sides. No pain in chest. Back regular.

Patient left today, almost well, i.e. well, except cardiac condition.

It is the more made upon the 9th Jan. that I would first draw attention to, and it will be observed in examination, that the condition described developed at a time when the patient was recovering from a very severe illness, and was suffering from grave cardiac disease. The heart was displaced to the left, and in amount of the pressure on the right auricle, the blood supply to the heart would be diminished, and the weakness of an already infected heart increased.

It was therefore decided to withdraw the fluid, and the patient was operated upon four times within eleven days and 174 ounces of hemonymph fluid withdrawn. Before each operation the patient was placed in a semi
recumbent position, and a little bandy was given to obviate as much as possible any tendency to syncope, and an account of the cardiac condition only a small quantity of fluid was withdrawn at each operation; lest the sudden removal of pressure should bring about the very condition that was sought to be avoided. From the date of the first tapping there was rapid improvement, each withdrawal of fluid being followed by marked relief to the patient, and eleven days later, when he was tapped for the last time, the esophagus, which was gradually altering in character, was free from blood. This was an indication of the gratifying progress of the case, for the continuance of the hematemetic esophagus (which had been demanding an arrest of phlegm) was evidently due to the pressure on the right auricle causing back-hand pressure on the pulmonary veins; the increased friction of the left lung together with the back-hand pressure, causing rupture of some of the smaller and already weakened vessels in the pulmonary tissue. But by the withdrawal of the fluid, and the reduction of pressure on the right auricle and right lung, the back-hand pressure on the posterior vein was reduced, and the increased taxation on the left lung diminished, and the blood circulation through the pulmonary tissue rendered more easy, so that the weakened vessels were relieved and the bleeding checked.

On the 7th Feb. just one month after the arrest of the phlegm, the patient was able to leave his bed and go about the ward. And on the 29th Feb. just three months after his admission to hospital, but within two months after the arrest of the phlegm, he was dismissed well, i.e. well, except the cardiac disease.

It would be difficult to overstate the results of this case; a result due entirely, I think, it will be admitted, to early operative treatment.
Had the case been treated alone by such drugs as generally used, the termination would almost certainly have been fatal. The patient had acute congestive disease, of all cardiac diseases the most liable to cause sudden death, and the large effusion in the pleural cavity must have pressed upon the thoracic organs and embarrassed the heart, increasing the danger.

In connection with this subject — the danger of cardiac failure — I have one more case to bring forward.

In December 1847 an Indian boy, aged 18 months, was taken to the cane fields by his mother, and laid on a blanket, under the shade of some trees, to sleep, while the mother went on with her work. In a few hours the woman returned and found the child dead. In inquiring the mother stated that on Dec. 23 the child began to be feverish and had a cough and pain in the chest. After a few days the cough ceased, but the pain in the chest & the fever continued till death. She says she did not consider the child ill enough for hospital. (I may mention that I saw the child on the 19th Dec., when it was quite well, being dismissed hospital on that day, having been treated for some slight diarrhea).

Post-mortem appearances — Heart considerably displaced to left, and somewhat pale in colour; left side empty, but the right contained a small quantity of clotted blood. Valves normal.

Right pleura adherent all over, thickened, and covered with a fibrinous exudation, and the cavity of the pleura filled with pus. The right lung was completely compressed and flattened, and contained no air.

Left pleura normal, and the left lung slightly emphysematous and congested. Other organs slightly congested, otherwise normal.
"Practiae Medicinae" (Philadelphia), M. Britton, Page 393.
It is evident from the post-mortem appearances that the child died from oedema through malnutrition of the heart. The presence of the fluid in the pleural cavity sufficient to have completely compressed the right lung, must have exerted great pressure on the right auricle and diminished the blood supply to the heart and enfeebled it. The left lung dilated and (as before pointed out) increased the obstruction to the thoracic circulation & diminished the aeration of the blood, augmenting the cardiac weakness, and ending in death. All these changes occurred in a few days, showing the rapidity with which they may bring about a fatal termination.

I think it would be hard to find three more instructive cases than those I have just given, as indicating the necessity of immediately relieving the pressure upon the heart. In two of the cases, where the pressure was not relieved, though neither patient had heart disease, the result was death. The other case, by the withdrawal of the fluid in the pleural cavity and the reduction of pressure, though the patient was suffering from a gross cardiac lesion, resulted in recovery.

Another of the consequences of a pleural effusion is the occurrence of suppuration (in the case may be an empyema from the beginning). The pus may burrow into the lung, or externally through the thoracic sinuses; or "may burrow in almost any direction and discharge itself at almost any surface".

The following case I saw last summer, a few days before the patient's death. As I have lost the notes made at the time I must narrate the case from memory.
I.

A. B. aged about 70. He had been ill for some weeks, with pain in the side, difficulty of breathing, cough and expectoration, and there were all the signs of effusion in the right pleural cavity. He was treated by the usual remedies, but without relief. After a time suppuration supervened (at least so far as can be judged by the history, though the case may have been an empyema from the first), with all the symptoms of the formation of pus, rigor, fever &c... not long after this the pus burst through the lung, and was expectorated in mouthfuls. At this time patient was obliged to sit up in bed for if he lay down, the pus would drain out through his mouth.

He was very weak, and had great difficulty in breathing, and the least exertion was attended with considerable fatigue. The lips were very blue, and the pus expectorated was foetid.

He was then seen by a surgeon, who made two openings into the pleural cavity, one high up and the other low down, and by means of drainage tubes washed out the cavity with a weak solution of carbolic acid. The patient died however a few days after the operation.

The point of present interest in this case is, that the pus in the pleural cavity burst into the lung. Of course the operation just described has been performed in such cases with success, but is it desirable to allow cases to go on till such an operation be necessary? Because some cases have been cured by operating after the pus has burst into the lung, is an argument in favour of delaying operation till that takes place, for as we have just seen it sometimes fails. It certainly seems far better to operate early and to avoid thegue line of the lung than to
IvC u X

I propose to discuss this case, however, more fully in conjunction with
the following.

II

J. R. aged 30. Admitted March 29th

Complains of pain in the chest, cough and difficulty of breathing.
Present illness began 3 weeks ago from exposure to cold, & began with
chills, followed by pain in the chest and feverishness.

In examination of the chest, there are found, diminution of movement
of all our left side during respiration, and marked bulging of the intercostal
spaces, and on looking at the patient from behind, the left side seems
invers, & the right slightly uncinate. Marked dulleess on percussion
of all our left side front and back from apex to base, while percussion
in note on right side seems normal, or if anything slightly hypetensant.

Diminution of R. P. front & back above level of a line drawn around
side of chest, at level of nipple, below this the R. P. becomes gradually
less & less distinct, and at base of left lung is wholly absent.

R. P. on right side is highly fiexible.

V. R. on left side much diminished, and V. F. is wholly absent (this
is well demonstrated as the patient has a deep chest piece, and it
is felt with great distincteness on right side).

Aper impulse is much displaced to the right, and when patient lies
on back seems to be beating behind the sternum, but on making
patient lie on right side, it is felt just on right border of sternum
in 5th interspace, just 3 inches to right of its normal position.

Right border of cardiac dulness is fully 1 inch to right of right
border of sternum; left border cannot be defined on account of the
absolute dulness of left side. Pulse 80, regular, soft and easily
compressible. Respiration 24, not markedly abdominal. Hepatic
dulness normal, and not displaced. Lungs diminished in quantity.
The dulness of breathing is markedly increased on any motion.
April 14th, 60 ounces of clear straw colored fluid withdrawn by
aspiration; limit increased from 12.3 to 46.3 during the 24 hours after.
April 11th, 20 ounces of clear fluid withdrawn, when the canula became
plugged with clear lymph.
April 12th, 20 ounces of clear fluid withdrawn, when the canula again
became plugged.
April 30th. In the last few days (since the 22nd) there has been
rise in temperature. Today patient was tapped twice, but in both
occasions the tube became blotted, with only a little fluid coming away (about
two teaspoonfuls) which was quite clear.
May 5th. An indication reveals dulness over the middle part of
lateral region. R. In. quite good as well as apex in front, though
difficulty in remaining part of lung.
May 15th. Temperature still remains high, and exploring puncture
was made to day with hypodermic needle. The syringe was quite
filled with purulent fluid mixed with a few drops of blood.
May 22nd. Patient transferred to surgical ward to be treated for
empyema, and kept well, at the end of July.

These two cases resemble one another in so far as in both the effusion was
originally purulent, and in the progress of the disease became purulent.
In the one, however, the purulent fluid entered into the lung, in the
other, the operation for empyema was performed. In examining the
"Practice of Medicine" (Planning), Dr. Aristotle, page 343.
latter case more closely it is noted that by April 18th the patient had been tapped three times and 100 c.c.s. of clear fluid withdrawn. In the 22nd year, day after last tapping there was a rise in temperature, and on the 25th the temperature was still high. Patient was again tapped, but upon the two occasions it was done the tube became blocked only a little fluid coming away which was quite clear. In the 11th May an exploratory puncture was made with the hypodermic needle fluid withdrawn. Now when rigor, pain, elevation of temperature &c. occur in the course of a hitherto simple case, they are presumed to be indicative of suppuration! The question then comes to be, would it not be better to make a free incision into the pleural cavity with the worst of these symptoms, than to wait for the formation of pus?

Of course the speed with which suppuration occurs will vary in each case with the degree of inflammation and the health of the patient. In the above case 8 days after the rise of temperature the fluid in the chest was still clear. By operating now an efficient drainage of the fluid would be established and whenever pus formed it would have a free escape, and the chances would at least be in favour of a more speedy ameliorance, than if the operation be performed as in the above case one month after the onset of the inflammatory action.

In some cases, after the onset of the symptoms above referred to, the attack passes off, it is well known, but they are the exception, not the rule; and in no way affect the necessity for interence. But these symptoms in some cases may draw reference to an inflammatory attack of the bronchial tubes, pulmonary tissue &c. suppurring on the pleurisy, and which will tend to still further reduce the general health, and increase
1. "Every organ of the body has its proper duties to perform, and under the influence of moral provocation, these duties become increased or diminished, and in either case progressively modified, more or less." (Functional arrangement - page 85 - 13 ms text)

1. "Plural organs tend to become vagile in children and in temperate adults." (Lectures on Physiology, Dr. Jenner.)
the tendency for the fluid in the pleural cavity to become purulent, so that
the pur iniam is likewise necessary.

It is obvious that a patient is in a better state of health at the onset of
a pleurisy, than after the inflammation has been going on for some time,
and which according to its degree influences the nutrition and function of
all parts of the system. And it must be remembered, that in certain
cases the inflammation tends rapidly to the formation of pus.

Without following the physiological processes in detail it will be granted, that
the longer the inflammation and suppuration go on, the sooner will be the
drain upon the system and the greater the constitutional debility, so that
the longer we delay in aiding nature to throw off these morbid processes, the more
are we increasing the deteriorisation of tissue generally, until at last when we
do interfere, the system has become so low as not to be able to take
advantage of the assistance, and death results, as we have already seen; or
else the assistance has come when the functional activity of the tissues is no
reduced, that healthy action is long in being established, i.e., convalescence is
near. But if the assistance be given before these results take place, that
is, before the system generally is influenced by the morbid process, the tissues
will be in a state of greater activity, and so respond more readily to the
aid given.

In the two cases just given, one patient died, and the other had a prolonged
convalescence. By the treatment advocated (free union with use of sympatric
prescription of suppuration) might not a more rapid result be attained, viz.

already convalescence.

As already pointed out, there are some cases where the inflammation tends
capacity to the formation of pus, and the following are two cases in point.
I. J. M. W. 10. Admitted Dec. 13th. Complaining of pain in the chest, cough and difficulty of breathing. Present illness began two weeks ago, when patient got a cold, and illness set in with shivering. Before this patient was at school but was over a long boy.

An examination of chest—there was found to be great dullness existing all over the right side behind 3 inches from the clavicle down wards for about 3 inches, where the percussion note is somewhat tympanic. There is complete absence of resonance all over the right side during respiration, and there is distinct bulging of that side. Over the tympanic area of right side and about 3 inches below this is also behind to a corresponding distance downwards, there is well marked tubular breathing. Over lower part of right lung no respiratory sound is heard at all, & over the part of chest is absence of V. R. and V. E. but the latter is exaggerated in upper part of right side. All over left side the pulmonary percussion note is somewhat tympanic, and there is exaggerated pulmonary breathing. The breathing is greatly laboured and is distinctly abdominal.

The lower border of the liver is displaced downwards about 1½ inches, but the upper border cannot be made out on account of the dullness at lower part of right side, the pulmonary & hepatic dullness blending. Patient's face is flushed and there is paradoxic dilatation of the costal during respiration. There is also an herpetic eruption on lower border of face & abdomen.

Apex beat is in 5th left intercostal space a little to left of middle line. Cardiac sounds normal, but the heart is acting very rapidly.

Cardiac dullness begins at upper border of 3rd rib, & extends somewhat unusually far to the left, planting downwards to site of apex impulse.
Page 120, Mr. S. complain'd of. Respiration 60. Temperature 101° on admission. There is considerable cough, and a considerable quantity of viscid, frothy, mucous expectation but contains no trace of blood. Heart sound.

In admission he was placed in exploratory needle was used and fluid corticosteroid withdrawn from right side of chest.

Dec. 18th. Higher temperature during the last 24 hours 102°, lowest 101°. Limit during last 24 hrs. 24 3, previous 24 hrs. 16 3.

Patient lies on back & left side, he cannot lie on right side on account of the pain. 14 oz of greenish brown fluid blood clots have been withdrawn from pleura by the aspirator.

From this till the 14th of January there was slight improvement, pain less as also cough, and the expectation diminished, and the respirations were fuller. Appetite also improved, but the urine remained present. All this time however the temperature remained high, and there was evidence of considerable quantity of fluid in right pleural cavity, and the patient was transferred to surgical ward.

Jan. 21st. Free drainage made pretty free down in right side, and drainage tube introduced, and drained antiemically.

Jan. 26th. Discharge from small in amount. Temperature normal.

Feb. 17th. Drainage tube removed and wound allowed to heal.

Feb. 26th. Wound full of granulations.

March 29th. Wound healed.

April 11th. Patient left well. Before leaving, I examined the chest.

R. H. has heard all over right side, & V. R. & V. F. are both well marked. There was an equal amount of movement during respiration on both sides of the chest.
J. M. aged 43. Admitted Dec. 10th.
Complaining of great pain in right side of chest, and difficulty of breathing.
[Patient has been given to the inordinate use of intoxicating liquors].
The pain in the chest is increased by taking a deep inspiration, or a
swallowing.
Attack began one week ago, with a feeling of shivering on going to bed;
patient having got wet through in the morning, and remaining in his wet

clothes all day.
Respiration is considerably oppressed, is markedly abdominal, and much
greater movement of the side & expansion of chest existing on left side.
Indeed, below level of nipple on right side there is almost an entire absence
of movement; and this becomes much more marked on palpation.
There is dullness from below lower border of 2nd rib on right side. Just
below clavicle percussive note seems somewhat hyperresonant. All over left-
side, percussion is unusually resonant, and cardiac dullness is if anything
smaller than usual. All over left side R. M. is somewhat pulsible, but
no pulse is at any part detected. On right side, from clavicle downward
the R. M. is markedly diminished and is almost wholly absent below the
level of 3rd rib, when the dullness becomes absolute. V. R. is also
decidedly diminished, and V. F. all over the dull area is indeed wholly
absent, but well marked on left side. All over right back dullness of an
absolute kind extends as high as spine opinion for, I hope the percuting
note is fairly clear. But this dull area is well marked defecting of
R. M. V. F. is here, as elsewhere on right side, wholly absent. No pulse
at any part of right side.
Deafness, a back and towards right side, both pain and dyspnoea being
experienced on attempting to lie in left side. Complains of little cough
but the pain in right side exists to a great degree, and is exaggerated by any movement, as rotation or coughing.

The exploratory needle was used today in admission, and fluid withdrawn from right pleural cavity.

Dec. 20th. 110 c.c. of purulent looking material withdrawn by the aspirator. From this the patient improved slightly, the pain was diminished & the cough relieved, & in Jan. 6th 37 c.c. of purulent fluid were again withdrawn. The temperature however remained high and the patient was transferred to the Surgical ward. He was operated in for empyema, and had a slow convalescence, being discharged in the middle of June.

What I wish to draw attention to in these two cases is the protracted convalescence. In admission to hospital the patient had been ill for one week, and the other for two weeks. Shortly after admission the exploratory needle was used & the fluid in the pleural cavities was found to be purulent. Both patients were treated by the aspirator, and both slightly improved, but the progress of the cases was so slow that it was decided to make a free incision into the pleural cavity and allow the fluid to drain off, this was done in the one case 39 days after admission, and in the other about one month after.

Now the fluid in the pleural cavity in these cases was purulent from the beginning, so far as could be judged from the history & health of the patient (one being a delicate child, & the other an intemperate man). As any rate it was an admission to hospital, in one case one week, 6 in the other two weeks, after the onset of the inflammation. In fact in each case we were dealing with an abscess of the pleural cavity.
Referring to diuretics &c., Dr. Barlow says (Practice of Medicine, page 395), "We believe all such agents are practically useless for the purpose indicated, & that if we are to trust in drugs at all, they should be those which by tending to improve the general health of the system, tend indirectly to promote healthy action at the rear of disease; in mean times, especially win & survive."

2. "Practice of Medicine" (Pinnig), Bristol. Page 396.
Do attempt to treat such cases with the aspiration, I find the patient upon diuretics &c. I am not to waste time. But only are these drugs useless, but they do harm, for when given for any length of time, they impair digestion, and do increase the patient’s weakness. What is needed is to improve the health of the patient, by foods, wine with food &c. 

Had this treatment been adopted in the two cases I have just given, one month would have been gained in one case, & 39 days in the other, surely a very important consideration when we remember the state of health at the onset of the disease.

In examining the first case more closely, it will be noted that the patient was operated upon surgically on the 21st January, and on the 26th, five days later, the discharge was insane of the temperature normal. I have had been continuance of fever and the presence of fluid of a purulent nature in the pleural cavity for 39 days, and yet when a free discharge was ensured the temperature became normal, and the fluid vanish within five days.

From arguments already advanced (in examining the two cases immediately preceding this at present referred to) it seems that such a result—might be expected with an early operation, and so avoid the long continuance of fever and the prolonged presence of purulent fluid in the pleural cavity.

The free inclusion into the pleural cavity is looked upon too much as a "demi-curé," instead of being regarded as one of the best forms of treatment. In referring to empyema, Dr. 3d of the page 3 the best method of treatment is, we believe, to treat the case from first to last—antiseptically, allowing the pus to escape freely through a canula or drainage
take into antiseptic dressings, which should be renewed daily."

One such treatment more frequently resorted to, the progress of such cases would be much more satisfactory.

The following are cases in which the effusions in the pleural cavities were proven, treated by the early use of the aspirator, and resulting in rapid recovery.


Illness began 3 weeks ago with great pain in left side. Patient states very firmly that he never had any feverish attack. A tendency to shortness of breath, a indeed any discomfort except the pain. He has no cough or nose irritation, but feels breathless on going up stairs. Pulse 120, somewhat weak and feeble. Respiration 28, rapid and slightly abdominal.

There is distinct bluing of both face and lips, the latter being especially well marked. Limit normal in character.

Absolute dullness exists all over left side of chest; over upper part of left side the R. M. is faint, while below it is totally absent.

On left side V. A. is greatly diminished, and V. F. cannot be made out. Percussion on right side is normal, and the R. M. is distinctly audible. The heart is displaced to the right, and the aortic impulse felt at ensiform cartilage. In measurement of the chest, at level of nipple, the left is half an inch longer than the right.

Jan. 11. 17 ounces of clear transpantant fluid withdrawn by aspirator.

Jan. 20. Patient states that he feels quite well, and does not know what he is kept in bed for. He went on improving rapidly, and on Feb. 15, the following condition was noted. Pulse 86, full and good. Respiration 20, full and easy, and on inspection there was
found to be an equal amount of movement of both sides of the chest during respiration. An examination of left side there is slight flattening in posterior in upper outer part of lung, and on auscultation, some slight diminution of R. M. in this area, as compared with the right.

V. F. is much the same on both sides, if anything a little more distinct on left side. Cardiac dullness is nearly as much displaced to the right, and after impulse is felt almost in normal position. For some time patient has been kept on semi-liquid food, and very little increased gain. I am as clean. Overt regular.

Patient left to day, quite well.

II.


Complaining of pain in the right side and difficulty of breathing.

Present illness began 3 weeks ago with pain in the right side. Patient had no chills, and he states that he did not get a chill, & knows of no cause for his illness. At present he has only slight cough, and hardly any expectoration. He can be equally well on either side, & I see no little difference in his breathing in which side he is.

An examination of chest there is found to be marked diminution of movement during respiration all over the right side, and this is well seen on palpation. On percussion in our right side of chest in front, there is dullness of an absolute kind extending downward from upper border of 3/4 rib, and blending below with the hepatic dullness which is much displaced downward, the lower border being about 1 inch above level of umbilicus. There is dullness all on anterior region of right side, & behind, dullness begins a little about the inferior angle of scapula. Above this level in front & behind, the percussion note is normal as-
hyperventilation. All over the dull area above noted, the R. Dr. is markedly deficient, and near the lower limit of the dullness is wholly absent. All over the clear area the R. Dr. is positive. Percussion note on left side is normal, and the R. Dr. loud and positive. V. R. on right side is markedly deficient as compared with the left, and over the absolutely dull area on right side the V. F. is wholly absent. Cardiac dullness seems normal in area, but is slightly displaced to the left, the apex beat being in the 5th left interspace a little to left of nipple line.

All through this illness from the very commencement there has been no increase of temperature, patient stating emphatically that he was never febrile, and an admission temperature was 98° 6. Pulse 60, full & regular. Urine small in quantity.

April 9.

48 ccm. of clear transparent fluid withdrawn by the aspirator.

April 10.

20 ccm. of clear fluid withdrawn.

April 16.

20 ccm. of clear fluid withdrawn.

April 30.

In examining chest today, the percussion note on right side is a little flat as compared with the left, but not absolutely dull. Both sides of the chest move equally during respiration & there is no bulging of the intercostal spaces on right side. Liver border of hepatic dullness is in its normal situation. Apex beat a little to right of nipple line. An auscultation of right side the R. Dr. is heard with great distinctness, all over, & can at the very base of the lung is only slightly fainter, if anything, than on left side. V. R. and V. F. the same on both sides. Patent left today, well.

In one year time he has not been well or has been troubled with cough. An account of his inability to speak, it is quite impossible to give any history of present illness.

An examination of chest there are found all the signs & symptoms of an extensive pleural effusion of the right side, rigidity of the intercostal spaces, dullness on percussion, diminution of movement during respiration, absence of R. M., V. R., and V. F. Heart is displaced about 1 inch to the left, and the liver is displaced downward.

Patient has a slight cough, but no expectoration.

March 27 4 ounces of clear fluid withdrawn by aspiration, when the canula became plugged.

March 31 14 ounces of clear fluid withdrawn, when the canula again became plugged. From this time patient improved rapidly and on the 30th April the following note was made. Equal amount of movement exists on both sides of the chest during respiration. R. M. to heard all over right side of chest, and almost as plainly as on left side. Upon deep and quick inspirations of breath are in their normal situation. Percussion is almost the same on both sides of the chest, but perhaps a little flatter on right side.

Patient kept to-day well.

These three cases speak for themselves, and I think I am not far wrong in stating that the satisfactory results were due primarily to the early operative treatment. That they would have recovered with like rapidity by medicinal treatment alone is improbable, and the two other cases I have given where both patients died, and where medicinal treatment alone was employed, bear out this view. Another point in combination of the
"When the lung has been long compressed — especially if at the same time it has been covered with a thick dense layer of false membrane, the attempt to remove of the fluid is probably attended with little or no restoration of the lung." (Ornitine). Page 390.
is, the collapsed condition of the lung so frequently demonstrated as the
result of a pleurisy in the first post-mortem table (noted in case III page
12). This condition occurs in cases where the lung has been long com-
pressed, either through the effusion not being recognised and the case
left to mature, or if recognised, operative treatment delayed till drugs
have failed in producing. In the case of the Indian child it was found,
just mature, but the right lung was completely compressed, and that
within 9 days (page 12). It can be easily understood how, if this condition
be allowed to remain, change occur, preventing the refilling of the lung with
air, as if allowing of restoration of affected lung, requiring considerable time
for its recovery.

I need hardly mention that these last and the other cases I have
given were put upon the various preparations of Potech, squills,
digitalis, convallaria majalis &c. as aids in the removal of the fluid.
It must be remembered that I am not advocating early operative
treatment per se, as opposed to medicinal treatment per se, but as
presenting the most favourable conditions for the action of drugs, for by
relieving the pressure on the thoracic organs and facilitating the circulation,
there is increased absorption and secretion — in fact — aiding drugs in
their action.

It will be noted that the number of times each patient was tapped
varied considerably, but in all the first operation was early.
After the first operation, the number of times the aspiration may require to
be used will depend upon the circumstances of the case. If after the
first tapping, the urine is increasing in quantity, the breathing becoming
easier, and there are other signs that the fluid in the pleural cavity is
becoming absorbed, the operation will not need to be repeated.
if the urine remains low, breathing is still difficult, and from other
signs the fluid is not undergoing absorption, it will be necessary to
repeat the operation, possibly many times, until either there are evidences
doing, or until all the fluid is withdrawn.
Unfortunately I have no cases to bring forward of pleural effusion as
complications of such diseases as small pox, scarlet fever, malignant
disease of lungs or pleura, &c. But here the necessity for early operative
treatment is urgent. For in the primary disease there are, excessive
waste of tissue, impairment of the blood and impairment of the
function of the various organs. If now a complication occurs such
as a pleural effusion, the excessive waste of tissue is increased, and
the blood is still further impaired by the interference with the functions
of the thoracic organs, preventing its proper action. Again, by the
pressure upon the heart, already weakened, the circulation is disturbed
and the tendency to other complications increased.
In localized pleural effusions, where the fluid is confined in cavities,
the result of adhesions in some old inflammation, early operative treat-
ment is also necessary.
In conclusion, I think the case I have given go far to indicate the benefits
resulting from early operative interference, and the danger of delay.
In some of the cases in which the aspirator was used early, the result was
all that could be desired. In few, where the treatment was very far
different, both patients died. In these, the consequence was very clear, a
result due to I have endeavoured to point out, to delay in the operation
already referred to. In one case of sudden death from apoplexy,
keeping in mind that the great danger in pleural effusions is cardiac
failure, paracentosis cannot be performed too early, and unilateral,
pleuritis.
Quain's "Dictionary of Medicine" (Pleuniş).
So... used to aid in the absorption of the fluid; in cases where the effusion is severe; and where in the progress of such cases symptoms occur indicative of suppuration, I think a free incision should be made at once without waiting for the formation of pus.

And these cases in which there is early formation of purulent fluid; remembering the condition of health of the patient, antiseptic treatment from the first seems to be the best; and full doses of iron and quinine administered.

The earlier the relief, the less the damage to the lung, and the better the hope of rapid amendment. This relief can only be given by early operative interference.